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TODAY'S PROBLEMS, YESTERDAY'S TOOLKIT

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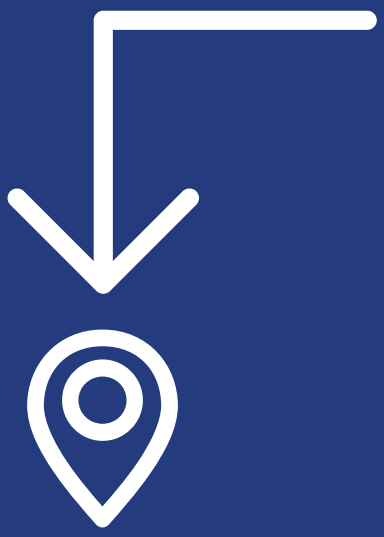


THE ROADMAP: TODAY'S PROBLEMS, YESTERDAY'S TOOLKIT

Governments of all political stripes are being buffeted by technological and societal change. There is a pervasive sense globally that governments are not doing as well as they ought to solve our biggest policy problems. Pressure has intensified to provide better services and experiences, and deliver measurable results that improve people's lives. The failure to meet our most pressing challenges help to explain why in Australia, trust in government is at an all-time low.

New technologies, however, bring with them the opportunity to rethink how the public sector in Australia might solve public problems by building a workforce with diverse and innovative skills, especially how to use data and actively reach out beyond the public sector itself.

Commissioned by the Australia and New Zealand School of Government (ANZSOG), this report builds on a pioneering survey of almost 400 public servants in Australia and New Zealand, dozens of interviews with senior practitioners, and original research into how governments around the world are training public officials in innovative practices.

The survey findings show that public servants are eager to embrace skills for innovation but receive inadequate training in them. Knowledge of new ways of working far outstrips practice. Blunt public sector management tools, including hiring freezes, efficiency dividends, and funding cuts that hobble innovative or experimental initiatives, are creating what interviewees for this study describe as a creeping crisis for the public sector. The slow adoption of tools widely used beyond government, together with cultural inertia, erodes the prospect of a more collaborative, creative and empathetic public sector workforce.

To reverse these trends, this report argues that governments must train public servants to become "public entrepreneurs" who tackle problems using innovative, data-driven, and participatory methods, and who are comfortable with risk and even initial failure in pursuit of outcomes that improve the lives of citizens.

The report begins by explaining why public problem-solving is so urgent at this moment in history. Public problems are increasingly complex, requiring coordinated solutions across many actors and public involvement to collect the necessary data, define the problems, and work together on solutions. The report then argues that improving individual skills provides the linchpin for tackling public problems and restoring trust in government.

We outline the core skills — the 21st century toolkit — of the public entrepreneur, and how governments around the world are putting these skills to use. We offer 10 recommendations for designing an effective public sector training program, emphasising the need to include both qualitative and quantitative skills.

We emphasise the need to use a mix of methods, avoiding a headlong rush to embrace any individual one, such as design thinking or data science, to the exclusion of others.

The report calls for a radical reshaping of training for public service leaders. Hybrid online and offline learning, and problem- and project-based coaching and mentorship, would all help public servants to become public entrepreneurs, skilled in public problem solving.

Finally, the report sets out the need for institutions to enable, support and reward public servants who exercise innovation skills. We document success stories of adaptive, evidence-based and collaborative public organisations. In particular, we identify how new institutions — labs, hubs and mission-driven organisations — are overcoming the fear of failure, promoting interventions based on what works, and developing policies and practices rooted in deep collaboration with those that government services most affect.

We believe that the ideas set out in this report provide the foundation for rebuilding trust in government by equipping public servants to provide solutions that address the most urgent public policy problems of our time.

THE PUBLIC PROBLEM SOLVING IMPERATIVE

THE DEATH OF TRUST

Trust in government in Australia is at an all-time low. According to survey data, fewer than 41 per cent of Australian citizens are satisfied with the way democracy works, a precipitous decline from 86 per cent in 2007. Just 31 per cent of the population say they trust the federal government. State and local governments perform little better, with approval ratings hovering around one-third. Ministers and MPs (whether federal or state) do far worse: they rate at just 21 per cent.[1] A YouGov-Cambridge Globalism survey of 1006 Australians found that 55 per cent believe politicians are listening to them less, while 63 per cent believe the people running the government are "crooked", and 76 per cent feel that "important information" is being concealed from the public.[2]

The phenomenon is not unique to Australia. The Edelman Trust Barometer paints a bleak picture, asserting that "government is now distrusted in 75 per cent of countries."[3] In Europe, Dalia Research finds that anti-establishment parties are on the rise because Europeans are fed up with the political classes: barely a third trust politicians to do the right thing, with Eastern Europeans registering only 23 per cent confidence in their leaders.[4]

In the United States, public trust in the government remains near historic lows. According to the Pew Research Center, "only 17 per cent of Americans today say they can trust the government in Washington to do what is right "just about always" (3 per cent) or "most of the time" (14 per cent)."[5] Societal distrust extends beyond the public sector to include all four traditional institutions: business, government, NGOs, and media. Trust in all of them has, in fact, declined broadly, with damaging consequences not only for governments' effectiveness but for individual well-being. The sense that the system is broken only "increases a person's vulnerability to fear, ultimately causing deeper distrust in institutions."[6]

There is a pervasive sense that government is not doing as well as it ought to improve people's lives.

Thus, notwithstanding empirical evidence that people in democracies live longer, healthier lives, and despite the proliferation of electoral democracies since World War II, our democratic institutions are coming under siege.[7] According to another recent Pew Research Center poll in 27 countries worldwide, a median of 51 per cent is dissatisfied with the way democracy is working in their country.[8]

As the crisis of governance reaches a nadir, people are seeking an alternative vision for democracy and for governance that is both more effective and more legitimate. That search provides the backdrop to this report.

WHY PUBLIC PROBLEM SOLVING IS SO URGENT

Government is indeed failing to deliver solutions that improve people's lives in measurable ways.

Every day, public servants help to land planes safely and on time, ensure that our food and drugs are safe, educate and feed our children without direct cost to those who need these services, and ensure that our communities are protected from crime and fraud,[9] among countless other everyday success stories of government.

Government continues to do much good. In Australia, governments deliver world-class health and education outcomes. The Federal Government ranks 5th globally on the International Civil Service Effectiveness Index. New Zealand ranks second.[10]

Scholar Mariana Mazzucato's *Entrepreneurial State* was devoted to debunking the myth that the private sector innovates whereas the public sector does not. Her book shines a light on the key public policies and grants that led, for example, to the Internet and GPS, and to biotech industries. A government agency even lent Apple $500,000 before it went public, investing in and enabling one of the great innovative technological success stories of our time.

Yet despite these many great successes, there is a pervasive sense that our public institutions are no longer up to the task of running things.

This distrust stems from more than perception. Government is indeed failing to deliver solutions that improve people's lives in measurable ways.

In a global study on infrastructure projects and the waste of billions of dollars through poor project management, Australia fared worse than the global average, with $108 million wasted for every billion dollars spent on infrastructure.[11] For instance, the Australian Senate set out a "litany of failures" following an inquiry into the performance of digital services.[12] These included the sale of Medicare card numbers on the dark web, repeated crashes of the ATO website, halting the start of schools' online NAPLAN testing and the abandonment of an apprenticeship platform, as well as the delivery problems that plagued the Digital Transformation Office and Agency.[13] In 2016, the Australian government's census website had to be shut down after repeated denial of service attacks. No one was held to account for the mess.[14]

In addition to repeated project failures, Yellow Vest protests in France, Brexit unrest in the UK, and constitutional crises in the United States are only a few of the manifestations of the great uncertainty and crisis of legitimacy afflicting numerous countries. Although the pervasive sense of unease affecting populations has many causes, from the fragmentation of work to the rise of social media, it predominantly stems from the sense that our quality of life is either stagnant or declining.

Of course, by some measures, society is making progress. In broad terms, trade, literacy, and mobility have all increased, both contributing to and facilitated by the explosion of Internet and mobile phone technologies. Globally, poverty is decreasing, and life expectancies are rising. The health of people living in developing countries around the world has improved considerably. For example, the total number of annual deaths among children less than five years of age has halved over the past 40 years.[15] Australia, too, is progressing, ranking 3rd on the United Nations Human Development Index and 2nd on the OECD Better Life Index.[16]

But that's only part of the story. Life expectancy for the poor hasn't increased and may even be declining globally.[17] In most of sub-Saharan Africa and some parts of South Asia, reductions in mortality have stagnated or even reversed over the past decade.[18] In India, 38 per cent of children are still malnourished.[19] While some diseases have been all but eradicated for certain populations, tuberculosis has re-emerged as a global health problem, while diseases such as diabetes, cancer, and heart disease have only risen with increased wealth and the resulting changes in diet, especially the rise in obesity.[20]

Pervasive racism besets our institutions, perpetuating disparities in income, educational outcomes, and even life expectancy.[21] Indigenous Australians are still worse off than non-Indigenous population by various metrics. For example, life expectancy is about ten years lower.[22] The rates of both unemployment and incarceration among Indigenous Australians are much higher.

Globally, massive inequalities persist. Across the OECD, average income of the richest 10 per cent of the population is about nine times that of the poorest 10 per cent.[23] Or, as Oxfam frames it, the richest one per cent of people in the world controls 82 per cent of the total wealth, and just 42 people own the same amount of wealth as the poorest 50 per cent of the global population.[24] For Australia, the Productivity Commission finds inequality levels comparable to other advanced economies, but of the ten leading nations on the United Nations Human Development Index, only the United States has higher income inequality than Australia.[25]

The leaders of 193 countries have committed to pursuing the 17 Sustainable Development Goals (SDGs). These include tackling poverty and inequality, promoting gender equality, good health, quality education, clean water, and sustainable cities. The National Sustainable Development Council into Australia's progress on the SDGs found policy drift on inequality, biodiversity and climate action.[26]

→ **Pervasive racism besets our institutions, perpetuating disparities in income, educational outcomes, and even life expectancy.[21]**

The latter is of paramount urgency. A U.N. report published at the end of 2018 concluded that the Earth is getting dangerously hot. Previous pledges to limit warming to two degrees Celsius made at the Paris climate summit three years earlier will not be enough to stave off the dangerous and life-threatening consequences of manmade climate change. Australia's emissions keep rising. On its current trajectory, Australia is not likely to even meet its modest Paris targets.[27]

When the five warmest years on record have all come in the 2010s and the 10 warmest years on record have all come since 1998, it is no wonder climate change tops the list of anxiety-inducing problems.[28] Only the wilfully blind fail to acknowledge the devastating effects of climate change caused by humans.

The melting Antarctic ice cap, rising temperatures and sea levels have led to more intense hurricanes,[29] more extreme and frequent wildfires,[30] more droughts and heatwaves, and less predictable precipitation patterns,[31] with the devastating human and economic consequences. Over a million species are expected to become extinct as a result of climate change and habitat destruction.[32]

But, as we shall discuss, these reflect a fundamental and urgent problem, namely failures of collective governance that prevent us from tackling these challenges.

WHY BUILDING SKILLS WILL RESTORE TRUST

To tackle today's complex and inter-dependent challenges, we need public entrepreneurs and organisations that use data-driven, participatory practices.

To restore trust in government, its institutions need to better address these complex and urgent public problems. We need better solutions, and even more urgently, new methods for arriving at those solutions with consistent regularity, frequency and success. These methods include problem definition, participatory design, data analytical skills, evidence-based thinking, open innovation and collaborative implementation.

Collectively, these new methods reflect a focus, firstly on solving public problems, and secondly, on doing so with an outward rather than an inward focus. An outward focus brings citizens and outside expertise into problem solving in effective ways at every feasible stage. These methods engage both with data and with people at every stage of the problem-solving process.

Technology — especially the technologies of big data and collective intelligence — are creating opportunities to reimagine how we govern in the 21st century: how to make decisions, design public services, and solve public problems. By making it possible for all stakeholders to use more diverse sources of information to get smarter more quickly, technologies are making it possible to work in ways that are both more legitimate and more effective.

This report sets out a hypothesis, built on global learning and a 2019 survey of public professionals in Australia and New Zealand, that learning to solve problems using a range of data-driven and participatory methods will change the institutions of government for the better. We must invest in training people to use those methods.

We want more success stories like Australia's pension system, National Competition Policy, the introduction of Medicare, the Higher Education Contribution Scheme, and the Goods and Services Tax.

Australia has an exciting opportunity to strengthen the ability of its public sector to solve public problems systematically, by building a differently skilled workforce, and providing opportunities and motivation to use innovative skills to improve people's lives.[33] Government can design and deliver policies and services more effectively and legitimately by paying attention to how individuals and teams innovate and their readiness to adopt new ways of working.[34]

Yet such ways of working are far from the norm in government today, a point that Australian public service leaders repeatedly emphasised in interviews for this report. They pointed to capability gaps throughout government, especially in middle management. To quote one expert on the Australian public service: "Middle management faces accountability systems that lead to risk avoidance, siloed mentality — they are sent a message of 'We don't trust you' in a context of uncertainty … so they roll back the willingness to do things differently and just play by the rules. This can be efficient when you know the answer, but more policy problems do not have this characteristic."

In fairness, the technologies available today were not always prevalent or affordable in the past. But now, change is overdue. **To be clear, this change is not political — not about selecting from among particular ideologies or regimes.** We need innovation in our policy toolkit across the ideological spectrum. Those new techniques, as we shall explore, centre on the better use of information from a variety of sources. The ability to take better advantage of both data and human intelligence also demands a mindset shift and recognition of the need to work openly and collaboratively.

Many in the private sector already understand that innovation in business depends on having people who possess the right skills.[35] It has become routine to nurture talent by providing digital, data and innovation training to help people work and think differently in business. In *The Innovator's DNA*, Harvard Business School professor Clayton Christensen explains that the ability to innovate is not innate but employs a set of learned practices that can and must be taught if businesses are to thrive. Universities, too, are competing to offer new programs in entrepreneurship in order to reskill their students for the future.[36]

Whereas entrepreneurship celebrates the whiz kid, public changemakers are often not "24-year-old male engineers parachuted in from Silicon Valley, but a diverse range of people who have worked in or around government for years, who are invested in their communities, or who simply like intractable problems."[37] We teach the next generation to create new businesses and strengthen private markets, but we are failing to equip a new generation of public leaders with contemporary ways of dealing with contemporary challenges.

There is a widening skills gap between the public and the private sector's use of creative problem-solving methods, enabled by new technologies. We need to cultivate the unique abilities that make people more effective public, not simply private, problem solvers. **This calls for a radical reshaping of the curriculum with which we train public leaders.**

Of course, lone innovators have always spontaneously sprung up among pioneers in government, even within hierarchical bureaucracies, without training. But what is exciting and hopeful is that today's tools are making it easier and cheaper for *masses of public servants* to adopt better methods for problem solving. We cannot afford to silo innovation in special digital or innovation agencies. Rather, everyone should learn to become a public entrepreneur.[38]

A recent study of successful system reforms in Australia and New Zealand stressed the importance of having champions within government who are able to overcome resistance and to implement and scale change. These champions did things differently, and stewarded a project right through implementation.[39] The champions used data and evidence in decision-making, on the one hand, but also tapped the collective intelligence of residents and experts, or convened a coalition of partners to drive through an innovative and, ultimately, successful program. It is the combination of more evidence-based and participatory methods, along with political awareness, that is yielding better results.

We need to accomplish this transition to working differently because individuals at all levels can be powerful agents of change. They decide how billions are spent, which issues become policy priorities, and which become the subjects of media attention, convenings, speeches and campaign promises. Architect and inventor Buckminster Fuller likened the power of the individual change agent to the trim tab, the small rudder that moves the big ship.[40] The public problem solver knows which tools to employ in the design, development, and implementation of solutions that work within a given agency culture and social context. And with urgent problems from inequality to climate change to species loss to tackle, we need to train more passionate and innovative people who are ready to go beyond mere compliance with the rules.

HOW PUBLIC PROBLEMS DIFFER

Public problems are compelling challenges where neither the problem nor the solution are well-understood, and both have to be defined in a contested political environment.

Before we go on to discuss the skills needed by today's public servants and how other governments are responding to this need with new forms of training, we offer a brief explanation of the meaning and nature of public problems. It is important to understand the unique traits possessed by public problems in order to understand the need for new kinds of training and skill-building.

The word "problem" derives from the Greek *problema*, meaning *obstacle*, and, indeed, in the realm of policy, the problems are true obstacles.

- Public problems are *compelling* and *important* challenges that we cannot ignore and are imperative and urgent to address.
- Public problems *lack a clear and consensual definition of the problem and its root causes.*
- Public problems *lack a clear and consensual solution.*

We must devise *and* implement approaches, often from different disciplines in a contested political environment, to improve people's lives and societal well-being.

We can draw an analogy to explain public problems by distinguishing between the challenge for European settlers of getting from Sydney to Perth in the 21st century, compared to the 19th century. Today, this problem is easily solved using today's tools — in fact, it is hardly a problem at all. Public problems, by contrast, are more analogous to the challenge those settlers would have faced getting from Sydney to Perth in the 19th century without modern means of transport, without roads, without maps, and lacking the knowledge of indigenous peoples of the terrain that lay in between.[41] The problem was fraught with unknowns. Yet over time, new technologies such as the steam engine, the horseless carriage and then the airplane transformed the trek across the country.

Ill-defined yet compelling challenges such as income inequality, social exclusion or climate change are what we might also call public problems. The late educational philosopher David Jonassen developed a taxonomy of problems, calling the ones we're considering here: *design problems* and *dilemmas*.[42]

Design problems are what he dubs the universal form of problem. "Design is a ubiquitous professional activity. In the fields of engineering, architecture, education and training, music, art, theatre, writing, interior decorating, agriculture, computer science, marketing, and nearly every professional endeavour, professionals design products, creations, processes, systems, activities, models, and a host of other outcomes."[43]

Design problems usually have vaguely defined or unclear goals. They "possess multiple solutions, with multiple solution paths." We cannot agree on the solution and we do not know how to implement the solution efficiently. What's more, design problems in his categorisation have no clear metric for success.

There is no easily intelligible consensus about the goal. So, what makes design challenges unique is, perhaps, the need for methods that make sense of the problem and the solution using one of myriad approaches taken from different disciplines.

Dilemmas capture another element of public problem-solving, namely its contested nature. "Dilemmas may be the most ill structured and unpredictable, often because there is no solution that will ever be acceptable to a significant portion of the people affected by the problem.... That does not mean that there are not many solutions, which can be attempted with variable degrees of success; however, none will ever meet the needs of the majority of people or escape the prospects of catastrophe. Dilemmas are often complex social situations with conflicting perspectives, and they are usually the most vexing of problems."[44] One has to navigate the communications challenge of persuading others to support a particular approach.

Public problem solving is hard. There is no simple set of heuristics or tools that works for design problems and dilemmas in the way that we have tricks for how to tackle mathematical or mechanical problems.

But even though there is no single, linear method or foolproof set of tools, there is an emerging consensus around a general process and set of approaches that take advantage of new technology to increase the likelihood of success. Now that we have defined and characterised public problems, the next section explores the new repertoire — the skillset of tech-enabled, creative problem-solving approaches — available in the digital age to address them.

THE PUBLIC PROBLEM-SOLVING PATHWAY

Getting from idea to implementation requires knowing how to use innovative methods in combination to solve problems.

Public entrepreneurship requires more than a knowledge of disconnected methods. It also demands an understanding of when to use these tools in a problem-solving process, anticipating the steps to take in order to get from A to B in an agile fashion.

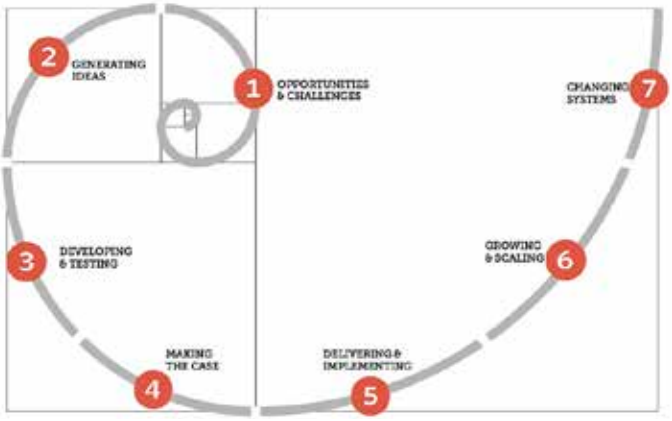
Tracing out the arc of the public problem-solving path will allow us to be more goal-oriented and anticipate the end result. Second, such a priori reflection may open our thinking to different ways of working. Third, outlining the likely course of action in advance will make it easier to plan milestones and deliverables, and avoid getting stuck by spending so much time, for example, on data analysis that we never have time to consult with residents face-to-face. Finally, seeing how the tools connect and anticipating the process as a whole helps us to see how these new ways of working add up to the means for solving problems more quickly.

Just as the job seeker needs to know the basic moves involved in training and applying for a job, and the entrepreneur needs to reflect on how to launch a successful business, the public entrepreneur needs to comprehend the science of problem solving and possess an overview of what is involved in solving public problems even before she dives into the specific methods.[45]

Every project-management process adopts a framework that tracks steps involved in identifying a problem and developing solutions. This framework is sometimes referred to as the *innovation cycle*.

Nesta, an innovation think tank in the UK with a large public sector practice, offers its own version of a problem-solving pathway that it calls the *innovation spiral* (Figure 1). It delineates separate stages for delivering, implementing, growing, and scaling a solution following the initial steps for articulating a problem. Steps four through seven deal with the difficult process of getting something done in practice. It starts with simply making the case to others and progresses toward systems change.

Figure 1 — NESTA Innovation Spiral.



Source: https://www.nesta.org.uk/data-visualisation-and-interactive/helping-innovation-happen/

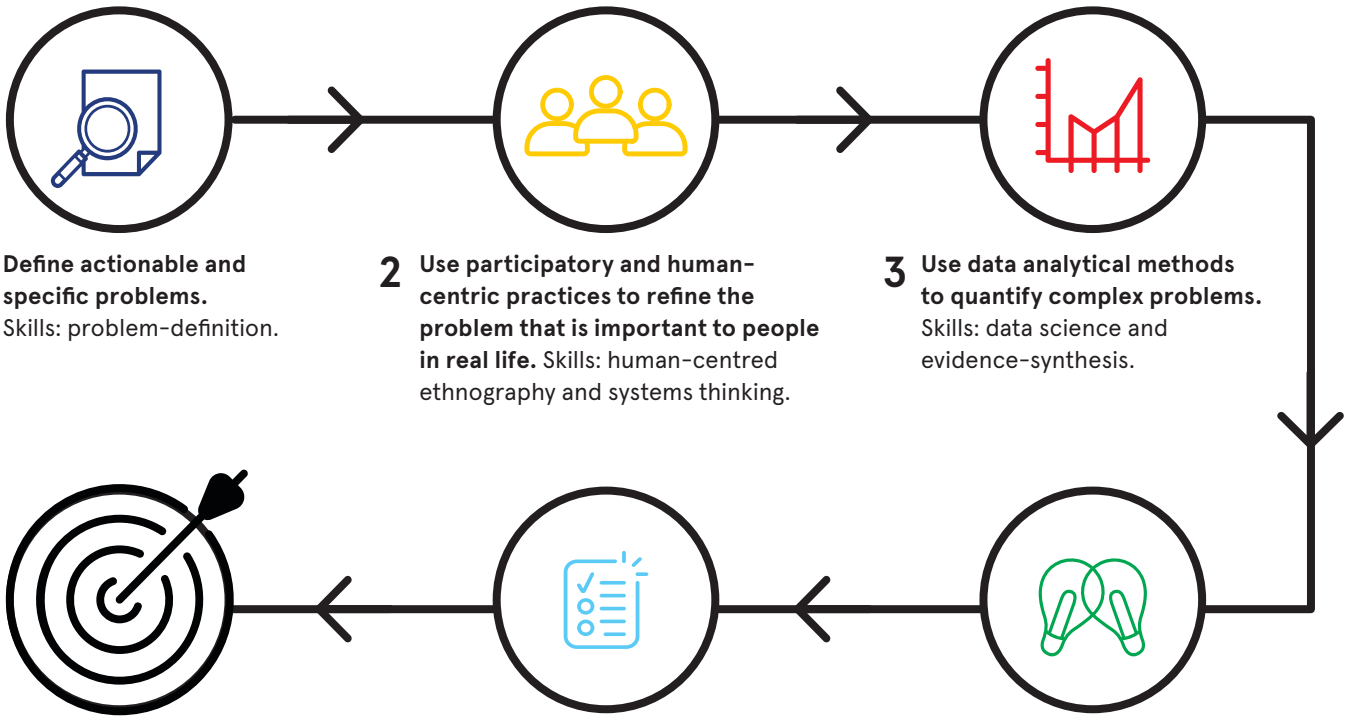
However, what this approach fails to make clear is that public problem solving is not a solitary process to be undertaken by the clever problem solver behind closed doors.

In order to succeed, no amount of erudition or leadership skill will substitute for the collaboration that is needed at every step. In fact, public problem-solving skills are directed not at convincing others that one is right, but at harnessing the collective intelligence of others to develop a deeper and more realistic understanding of both problem and solution, and to evolve along with them. We cannot be as smart alone as we are together, taking advantage of our diverse intelligence. And solutions will be more legitimate if they are developed with the benefit of participation.

Engaging with others to understand and define a problem, tapping their intelligence and expertise to design solutions, building partnerships and coalitions to implement those solutions, and distributing the labour of measuring what works are all collaborative processes. When done well, they accelerate public problem solving and render it both more effective and more legitimate.

Thus, we can summarise an agile public problem-solving process that traces the steps from problem to solution to implementation. At each stage, new methods and tools can help propel the process forward. These methods emphasise learning from data and from people so that problem-solving is informed by different kinds of learning and experience.

THE FIVE STEPS



1 **Define actionable and specific problems.** Skills: problem-definition.

2 **Use participatory and human-centric practices to refine the problem that is important to people in real life.** Skills: human-centred ethnography and systems thinking.

3 **Use data analytical methods to quantify complex problems.** Skills: data science and evidence-synthesis.

4 **Design solutions together by leveraging collective intelligence.** Skills: open innovation and behavioural insights.

5 **Implement measurable solutions** Skills: impact evaluation and building collaborative teams and partnerships.

INNOVATION SKILLS IN THE PUBLIC SECTOR

DEFINITIONS OF INNOVATION SKILLS IN THE PUBLIC SECTOR

In the private sector, according to Christensen *et al.*, innovative people possess five core skills — *associating, questioning, observing, experimenting,* and *networking* — that enable them to develop more successful products.[46] These are the skills that successful businessmen (all the innovators they profile are men) use to discover and deliver what sells. In the public sector, too, the skills profile of the innovative and successful public official is coming into view, but it differs considerably.

While Christensen *et al.* are concerned with innovation in support of profit maximisation, the end goal of the public entrepreneur is to solve public problems rather than to increase business efficiency or profits. This fundamentally affects their relationships with their "clients" (the public) and the methods they employ.

Let's look at how others are defining that public innovation skillset. **More often than not, these taxonomies describe a list of methods rather than a connected process for going from problem to solution to implementation. They do not necessarily provide a roadmap for how to connect the skills effectively.**

The OECD defines six core capacities for creative problem solving. The OECD did the first countrywide study of the pervasiveness of innovation skills in a survey of the Chilean public workforce, and subsequently elaborated on this work in a report on core governance innovation skills, both in 2017.[47] These skills are:

- Iteration
- Design thinking
- Digital thinking
- Data and evidence use
- Curiosity and flexibility
- New narratives & cooperation

Iteration describes the incremental and experimental development of both policies and services. Design thinking, or what the OECD sometimes describes as "user centricity," is the skill of using ethnographic practices to develop what the public wants and needs rather than what the public servant assumes. *Digital thinking* is the fashioning of research methods and solutions designed to take advantage of computers and computer networks. *Data and evidence use* refer to the skills of data literacy. Another skill identified by the OECD is *curiosity*, a willingness to try out new ways of working and doing. *New narratives*, or what others call storytelling, is the persuasive skill of explaining change in a way that builds support and cooperation. In subsequent materials, the OECD adds *insurgency* to the list of core skills, defining it as the ability to challenge the status quo and work with unusual partners.

THE PUBLIC ENTREPRENEUR'S SKILLSET

The skillset that enables the public entrepreneur to accelerate progress from idea to measurable solution includes five core problem-solving skills that comprise a number of novel methods. These skills are designed to foster both more effectiveness and legitimacy in how the public servant works.

First, public entrepreneurs must know how to define actionable and specific problems.

Second, public entrepreneurship demands the ability to use participatory and human-centred practices to further discover and refine the problem that matters to real people. These skills also involve applying systems thinking methods for identifying partners and stakeholders.

Third, public entrepreneurs must be able to use data analytical methods to understand complex problems quantitatively.[48]

Fourth, they must learn to design solutions together with those they are trying to help, by leveraging the collective intelligence of their communities to come up with innovative solutions that work.

Finally, public entrepreneurs must learn how to implement measurable solutions by building collaborative teams and partnerships that span multiple disciplines and sectors to effect change.

Let us look at each of these, in turn, and showcase concrete and specific examples of how they are being applied globally by diverse governments to illustrate how public sector skills are slowly changing.

First, public entrepreneurs must know how to define actionable and specific problems.

1. The Skill of Defining Problems Collaboratively

Public entrepreneurs must be able to go beyond vague issues to define actionable problems. This crucial skill precedes the use of new tools and methods in data science and collective intelligence, but ultimately depends on them for effective results.

Writing problem statements is a widespread practice, but the new skill of problem definition demands a different kind of work style and discipline from those used by policy analysts in the past. It cannot be done alone behind closed doors but must be constructed with the collaboration of local stakeholders and populations as well as global experts, taking account of local politics and context. That is to say, in order to identify a problem that matters and can be solved, problem definition must draw on diverse participants on different sides of an issue who can develop a clear and actionable understanding of the problem. Only people who understand the context can differentiate between the quick and the longer-term wins it will generate.[49]

2. Participatory Design Skills

Agencies are practicing the methodologies of human-centred design to deliver services more effectively in conversation with those who will use them. Human-centred design asks: "Who are we creating the service for?" and "What are their needs?" rather than "What are we building?" It holds back from a top-down search for a solution that aligns with the needs of a government program, choosing instead a bottom-up effort to test many possible solutions in the field in line with the needs of the most affected residents.[50]

Thus, instead of starting with the blueprint for a policy, service, or website rooted in the assumptions of the civil servant, practitioners of human-centred design investigate the context, behaviour, attitudes, needs, pain points, and motivations of relevant members of the public in an effort to understand how they experience a challenge.

For example, in North Carolina in the United States, the city of Durham organised a series of co-creation sessions with formerly incarcerated residents that led to the creation of a text-messaging campaign offering expungement of low-level convictions. Results were dramatically better than prior outreach efforts: 2,500 requests, compared to a couple of dozen when the city hosted in-person "amnesty days."[51] Four hundred and fifty residents had outstanding charges dropped. And another 79 people who no longer had any charges got waivers to dismiss significant fines and fees.

3. Data-Driven and Evidence-Based Skills

While the trend in public sector innovation is toward riskier forms of "failing fast" in human-centric lab settings, evangelists for public sector reform also embrace evidence-based decision-making and the use of data analysis as a key method for developing and evaluating policies and interventions. Thus, "performance management" is gaining traction through the application of machine learning and artificial intelligence technologies, helping policy-makers derive practical guidance from large quantities of data.

In San Francisco, for example, auto collisions with bikes and pedestrians threaten safety, killing more than 30 people in the city each year. To tackle the problem the Department of Public Health and the Department of Transportation developed TransBase to visualise incidents. They quickly discovered that 70 per cent of major injuries occur in just 12 per cent of intersections. Here, data-driven evidence made it possible to target and address the problem.[52]

4. Open Innovation Skills

As governments seek solutions to big and complex problems, open innovation (often backed by the incentive of a reward and known as a prize-backed challenge) has enabled the public sector to widen the pool of potential problem solvers beyond the "usual suspects" to get good ideas faster and from more diverse sources using digital platforms. Henry Chesbrough, a professor at the Haas School of Business at the University of California, Berkeley, popularised the term "open innovation" to describe the distributed process of working across organisational boundaries to accelerate innovation.[53] While originally used to describe how firms innovate using the external ideas of employees, suppliers and customers, open innovation has become common in government over the last decade.[54]

The US Federal government's open innovation platform Challenge.gov has hosted over 1000 such challenges since 2010 and engaged the public in tackling such hard problems as improving methods to find asteroids that could threaten the Earth and removing sediment from reservoirs. Public institutions are also turning to private platforms such as InnoCentive or Kaggle for help attracting "solvers" with good ideas to solve hard problems.[55]

5. Implementation and Collaboration Skills

Working collaboratively is a skill well understood by those developing new forms of public-private partnerships. These go beyond traditional outsourcing to include partnerships involving data and technology sharing.[56] Previously defined by contracts for a private entity to perform a government service and epitomised by privatisation and outsourcing of such services as the building or management of roads, prisons, schools, and hospitals, new kinds of collaborative partnerships with businesses, non-profits, and universities are enabling more effective governance through partnership with an increasingly networked and data-rich private sector.[57]

Public entrepreneurs know how to implement measurable solutions in the real world that improve people's lives. Teams with ideas often have a kernel of a brilliant solution but are almost invariably unable to show how the solution would work in practice, who would do what, how much would it cost, and what strategies and tactics could bring their idea to fruition. More than clever ideas and ingenious gadgets, our ability to solve problems depends upon people with the willingness and wherewithal to deliver and spread impact systematically, that is to say using new skills and disciplines to accomplish consistently what they set out to do.

TRAINING FOR INNOVATION SKILLS

Public sector skills training needs to be overhauled to impart the skills of public problem solving, taking advantage of new technology to deliver training and coaching at scale.

Governments, universities and philanthropies are **beginning to invest** in training those inside and outside of government in these new kinds of public entrepreneurial skills. They are also innovating in how they teach. What follows is ten learnings from our survey of global public sector innovation skills training programs.

Figure 2 — Lessons Learned from Global Training Programs

Summary of Recommendations

1	**Go hybrid:** Create face-to-face and online training
2	**Teach quantitative and qualitative skills:** The best training programs teach digital, data and design rather than exclusively one or the other
3	**Turn students into teachers:** Leverage alumni as experienced mentors
4	**Survey people:** Assess what people want to know and how they want to learn
5	**Strive for scale:** Build innovative agencies by training more people in different roles
6	**Focus on sector-specific innovation:** Teach public problem solving in a specific domain
7	**Coach, don't just train:** Enable people to take a project from idea to implementation
8	**Train citizens and civil servants together:** Create more public problem solvers
9	**Use citizens as trainers:** Leverage public know-how to strengthen innovation
10	**Teach the skills to solve problems:** Strengthen public entrepreneurship

1. Use Hybrid Learning

The better programs, like Canada's, are achieving greater scale by combining online and face-to-face methods.[58]

Canada has created a new Digital Academy to teach digital literacy to all 250,000 public servants. "In the age of smartphones, social media and apps that do everything, Canadians expect their government to serve them as seamlessly and as well as they've come to expect from the best digital service providers. Government exists to improve the lives of people, and a digitally enabled public service gives us an unprecedented opportunity to improve government services," writes the Honourable Scott Brison, Canada's Treasury Board Minister.

Among other approaches, they have created a 15-minute podcast series called bus rides to enable public servants to learn on their commute. The content is created both by the government and by third-party purveyors, and is designed to expand digital awareness and education for public sector employees. It includes modules on digital skills, data analysis, design, development and automation, evolutionary technologies, artificial intelligence and machine learning. Successful participants receive a certificate, access to the Digital Academy workspaces and invitations to community events.

Israel, too, uses online and offline training to "train outstanding leaders in promoting digital innovation in the public sector and improve services and interfaces with citizens through technology."[59] Its Digital Leaders program is a nine-month course, which alternates between web and live meetings as well as connecting learners to a UK-based online community of over 100,000 global public innovators. There are lectures on the digital revolution, including technology trends, change, innovation, entrepreneurship. The two annual cohorts comprising 40 national and local government and civil society leaders travel to Harvard Business School for a field trip to study digital transformation.

2. Teach Both Qualitative and Quantitative Skills

The public entrepreneur knows how to use data analytical methods and evidence-based decision-making to complement those qualitative with quantitative methods. Bloomberg Philanthropies, for example, invests in teaching data sciences to public officials as well as design, engagement and other innovation skills. The best programs teach both qualitative and quantitative skills.

Today, programs tend to do one or the other. For example, many programs exclusively teach human-centred design to public servants as WeGov does in Brazil. In Chile, the UAI University has just begun teaching quantitative skills, offering three-day intensive programs in data science for public servants to help them identify policies, processes and services that can be solved with the help of data science and formulate a proposal for a data science project in their agency.[60] But they do not teach human-centred methods.

But public entrepreneurs know how to use the tools of both data and collective intelligence in order to get smarter about problems and solutions. For example, while data might reveal where gun violence is occurring, to know why it is happening one must talk to those with relevant professional know-how as well as police, victims, and families. Both skills are equally important. However, the popularity of design thinking has led to a headlong rush to embrace one or the other set of tools to the exclusion of the other, as evidenced by an increasing number of design science courses and programs on the one hand, and of data science pedagogy on the other.

In the Open Seventeen program, a partnership among Tsinghua, New York, Zurich and Geneva Universities, students receive online project coaching in the application of both human-centred design and data analytical methods for the advancement of projects that respond to one of the 17 Sustainable Development Goals.

3. Mentor Alumni and Leverage Alumni as Mentors

To ensure that learning translates into practice, Australia's BizLab Academy, turns students into teachers by using alumni of their human-centred design training as mentors for new students.[61] The BizLab Academy teaches human-centric design principles, tools, and techniques to solve complex problems in the public sector. It also offers teacher training programs to train more experienced designers on how to use human-centric design principles effectively, preparing them to teach others in their own agency. The Academy is open to any public sector employee but are taught in Canberra (with plans in 2019 to offer new locations). Classes hold 10 to 15 participants. "Our challenge now is how to make the training 'stick'," writes Leanne Douglas of BizLab. "We have all been on training courses where we have left all excited but failed to apply the learnings to our work once we leave the classroom. To try to address this, we have established an alumni program to stay in touch with our graduates and support them once they return to their jobs."[62]

4. Survey People

In the public sector, we know very little about current skills and competencies. Many governments are investing in creating new training programs in an effort to change working practices. There is more than a little certain irony that, in an effort to spread the teaching of skills such as data analysis and human-centred design, public organisations are not applying those very same skills to assess training needs prior to developing their training programs.

Public organisations wishing to boost their performance and improve their approach to solving public problems should start by measuring the current state of their innovative, problem-solving skills and the characteristics of any skills gaps to understand what people know, what they would like to know and how they learn best.

In 2017, the Chilean government commissioned the OECD to conduct a first-of-its-kind study on the pervasiveness of innovation skills in its public workforce coping, to inform its training strategy. The OECD team conducted interviews with 90 public servants and surveyed 150 people focusing on assessing competency in innovation skills.

The research, while based on a small sample, enabled the consultants to follow up with in-depth interviews and later produce a 120-page report, finding that innovation skills exist only in pockets in the Chilean public sector, and languish without any coherent framework to bring them together or systematise them in public practice. Respondents indicated a particular skills gap in the area of citizen engagement. They also felt that, although their organisations were better prepared to use data science skills, managers frequently did not support employee efforts to practice innovative ways of working.

The findings in Chile paved the way for more recent empirical research into public sector innovation skills. The Canada Digital Service put out a skills survey at the end of 2018, asking public servants, "What digital training do you need?" The survey asked a random sample of 5,500 recipients about their knowledge of 30 digital trends, such as cybersecurity, data visualisation and machine learning. They used the results in 2019 to shape the rollout of the Digital Academy, which teaches digital literacy through a series of courses that target public servants at different levels of government. The offerings range from short crash course videos aimed at all 250,000 public servants to intensive, multi-day workshops for executives and senior leaders. The Academy's use of a skills survey prior to rolling out its training has led to a better-informed design and a more cost-efficient rollout.

5. Strive for Scale

Recognising that to transform whole agencies and change public sector culture, it is not enough to train only a lone innovator or data scientist in a unit. Governments as large as Canada are scaling their programs across the public sector. In the City of Denver, Colorado Peak Academy aims to "turn 10,300 employees into innovators." The Academy trains municipal employees to learn the Toyota model of lean analytical methods to make their agencies more efficient. The City contends that their public works department saved a million dollars thanks to the skills developed in the Academy. In another anecdote, one Denver employee created over $46,000 USD of annual savings in the wastewater division simply by devising a way to scrap the use of certified mail to send 11,000 reminder letters each year.[63]

Argentina's LabGob has already trained 30,000 federal, provincial and local officials since 2016 in its Design Academy for Public Policy, with plans to expand.[64] Following the OECD model, they teach iteration, design thinking, digital thinking, data use as evidence, curiosity and flexibility, and new narratives and collaborations. They have curricula entitled: "Big Data: Let Data Speak," "Learning Dialogues: Evaluation and Big Data," "Learning Dialogues: Education Innovation in the Public Sector," "Introduction to Civil Innovations" and "Introduction to Open Data." Programs range from one day to four-week programs. For every class taken, a public servant earns points that serve as a prerequisite for promotions and pay raises in the Argentinian civil service.

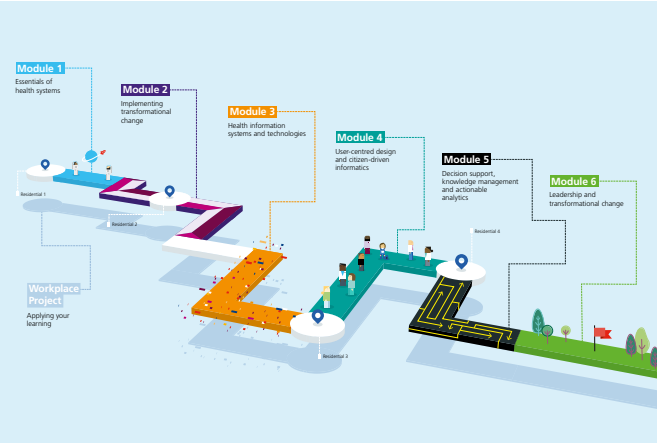
→ **For every class taken, a public servant earns points that serve as a prerequisite for promotions and pay rises...**

6. Focus on Sector-Specific Innovation

Rather than going broad, some training programs are going deep by teaching sector-specific innovation skills.[65] The NHS Digital Academy, run in collaboration with Imperial College, is a series of six online and four live sessions aimed at producing leaders in health innovation. It is designed to "develop a new generation of excellent digital leaders who can drive the information and technology transformation of the NHS." The curriculum includes essentials of health systems, implementing transformational change, user-centred design, citizen-driven informatics, decision support and actionable data analytics. Training is accompanied by leadership and workplace project coaching.

The first cohort of the academy comprised 104 health professionals, and 166 participated in the second class. Students who successfully complete the program can add an additional year of study at their own expense to complete an MSc in Digital Health Leadership from Imperial College.

Figure 3 — NHS Digital Academy Program Pathway.



Source: https://www.england.nhs.uk/wp-content/uploads/2019/08/nhsda-application-booklet-v8.pdf

7. Coach, Don't Just Train

In our work at The GovLab, we are helping public entrepreneurs take their public interest projects from idea to implementation using coaching, rather than training.[66] The programs are tailored to participants who have a specific goal in mind, such as a problem they want to work on or a project they are keen to implement.

Training classes may be wonderful, but often leave people feeling abandoned when they return to their desks to face the challenge of innovating within a bureaucracy. With hands-on mentoring from global leaders and peer-to-peer support, the GovLab Academy coaching programs try to ensure that public servants are getting the help they need to advance innovative projects. The curriculum comprises live but online sessions delivered over ten weeks. Session topics are: 1) Defining the problem, 2) Rapid results research, 3) People-led innovation, 4) Convincing others, 5) Prototyping, testing and development, and 6) Measuring impact. Over the years, we have been able to train thousands of public employees, civil society leaders and students because we connect them to mentors who can coach them, helping them to advance their projects.

8. Train the Public and Public Officials

The Cities of Orlando and São Paulo go beyond training public servants. Orlando includes members of the public in its training program for city officials. Because they are learning to redesign services with citizens, the public participates in the training.[67]

Taiwan is educating its public officials in how to engage residents in decision-making, ensuring they know how to consult with citizens when making policy, and then signing them up to be part of a cross-agency Participation Officers Network.[68] Other jurisdictions such as São Paulo are taking the relationship with residents a step further by having employees learn from citizens, as discussed in the next section.

9. Use Citizens as Trainers

The São Paulo Abierta ("open") program uses citizens as trainers for the city's public servants.[69] Over 23,000 of them have studied with these lay trainers, who possess the innovation skills that are in short supply in government. Citizens of São Paulo apply to be teachers by submitting a course proposal. For each cycle the selection committee approves about 30 courses, which are free and accessible to all. Potential trainers must demonstrate at least a year of knowledge, expertise or experience in the subject in question. Public employees or elected government officials cannot be instructors.[70]

Figure 4 — GovLab Academy Coaching Program.

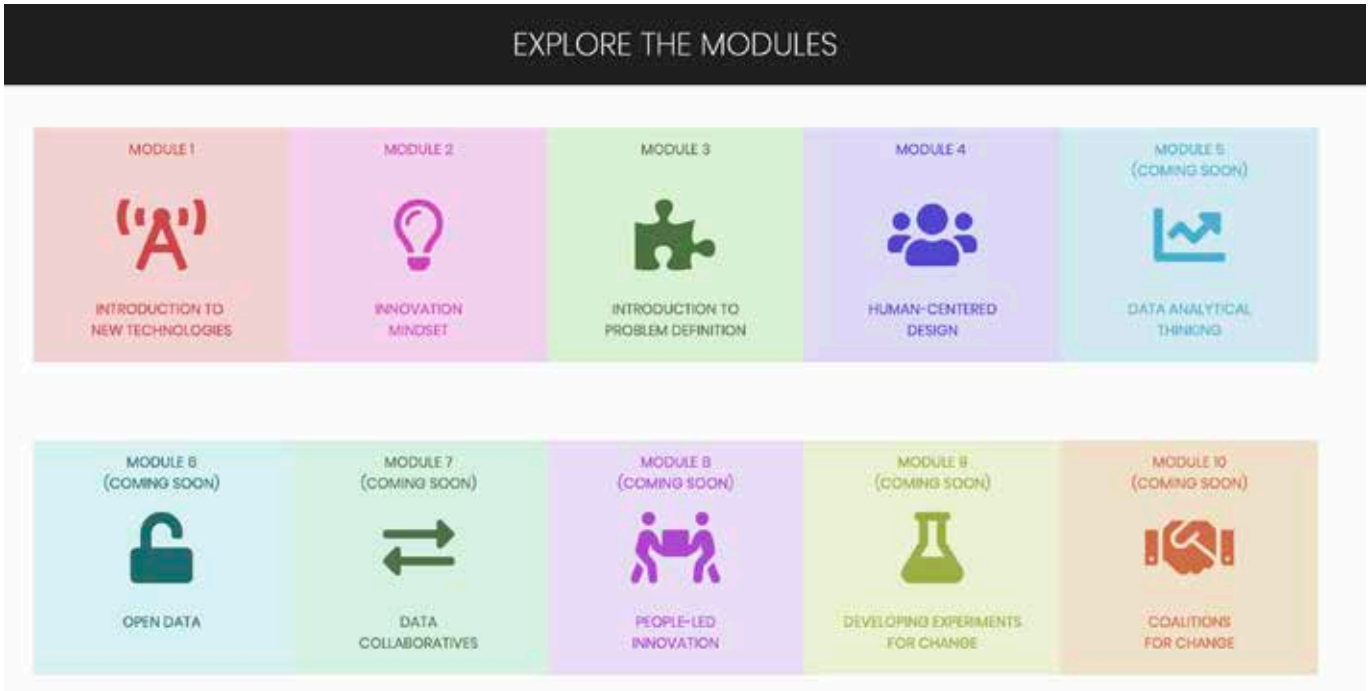
Source: http://govlabacademy.org/coaching-programs.html

10. Teach the Skills to Solve Public Problems

Finally, because what matters is not how many people take a course or listen to a podcast but how much these innovation skills contribute to people's ability to solve public problems, the State of New Jersey created a free, online training program in public entrepreneurship designed to introduce people to the basic skills for moving from idea to implementation. This program, too, strives for scale by offering the program at no cost to 70,000 public servants via the State's training platform and to the world via an open website. Like many others, it is a hybrid program. Those who finish this online course are eligible for intensive, in-person coaching. Covering 10 skills, the program follows a learning pathway that begins with an introduction to new technologies to ensure a common vocabulary among participants, then continues with problem identification, human-centred design, data analytical thinking and other problem-solving methods. The short lectures offer how-to exercises. Practitioner interviews, readings and self-assessments accompany the lectures.

Across the world, these different capacity building efforts reflect a common thesis: namely, that changing the ability of individuals to innovate will improve institutional effectiveness and legitimacy and will restore trust in government. These courses and programs centre on enabling the use of new sources of information and applying them to develop more solutions to public problems with more impact. Put another way, they are enhancing substantive outcomes rather than compliance with rules or procedures. **Collectively, the initiatives are offering us a new way to think about and measure public service in terms of crafting and implementing solutions that work.**

Figure 5 — NJ Innovation Skills Accelerator Curriculum



Source: https://innovation.nj.gov/skills/

ANZSOG SURVEY OF INNOVATION SKILLS

Awareness of public sector innovation skills may be moderately distributed, but the practice of the skills is limited. People are not using modern skills in their work.

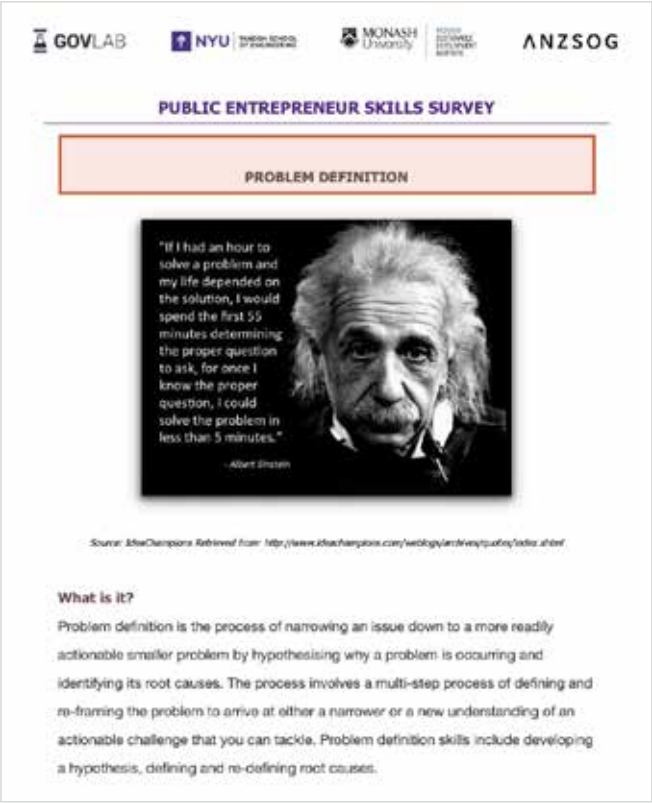
Our assertion that there is an urgent need to address the practice of public problem solving with new forms of training and learning stems from the empirical findings of a 2019 survey conducted by Monash Sustainable Development Institute and the Governance Lab on behalf of ANZSOG. The survey was distributed through ANZSOG's network of leaders of state and federal agencies in Australia and New Zealand who, in turn, circulated the survey within their organisations. The survey was also distributed via social media. Between June 12 to July 12, 2019, 381 responses were returned: 90 per cent are Australian public servants and 10 per cent from New Zealand. The majority of the respondents work in a federal agency (55 per cent), are mid or senior level managers (80 per cent) and work on strategic policy, project and program management or human resources.

The annexes to this report contain the survey questions and answers, along with more details about our methods.

Drawing upon our research on global public sector innovation skills and skills training, we surveyed Australian and New Zealand public servants about what they know, how they learn and would like to learn, and how innovation skills are used in their agencies.[71] We developed the survey to assess to what extent people knew about and applied new ways of working in their agencies.

"We want to know more about your current interest in and knowledge of these skills," we asked people. "In each of the following sections, we will: 1) define a skill and why it is important to make sure we share a common understanding, 2) provide an example, again, to make sure what we are asking about is clear, and 3) ask you to answer 3 questions about your use of that skill."

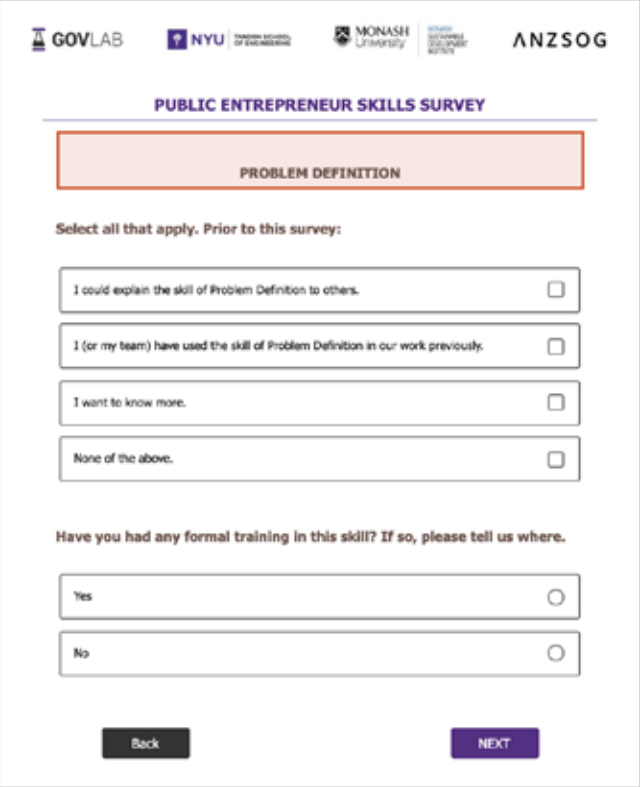
Figure 6 — Screenshot of the survey — Defining the skill and why it is important



Rather than ask people to self-assess their own level of expertise — a notoriously ineffective and unreliable strategy — we asked public servants to distinguish between:

- Your ability to explain [the skill] to others
- You or your team's experience using [the skill] in practice.[72]

Figure 7 — Screenshot of the survey — Questions from the survey



We wanted to assess whether people simply had familiarity with a concept or also knew how to apply a skill in practice. If they used the skill, we asked people how often they applied one of these innovative ways of working on the job. We also asked them if they wanted to learn more. Finally, we asked if and where people had received any formal training in that skill (see survey instrument in Annex II). In order to keep the survey brief, the online questionnaire randomly presented each respondent with questions about six of nine innovative public entrepreneurial skills.

The 9 skills we asked people about were:

1. Problem Definition — Problem definition narrows an issue down to a smaller, more readily actionable problem by hypothesising why a problem is occurring and identifying its root causes. The process involves a multi-step process of defining and re-framing the problem to arrive at either a narrower or a new understanding of an actionable challenge that you can tackle. Problem definition skills include an iterative process of developing a hypothesis and defining root causes.

2. Human-Centred Design — Human-centred design is an iterative process that starts with the people you're designing for and ends with new solutions that are tailor-made to suit their needs. Drawing on ethnographic practices, it consists of observing or talking to those affected by a policy or service to understand their needs, desires and experiences. Human-centred design engages and involves users from start to finish: from the initial research into defining a problem, to creating solutions and then testing and implementing them. This qualitative research skill can involve such sub-skills as interviewing, prototyping and journey mapping.

3. Data Analytical Thinking — Data analytical thinking emphasises the value of data to achieve improved outcomes, better equity, reduced cost and increased efficiency in how public policies and services are created. Data analytical skills include formulating a hypothesis, identifying data to test a hypothesis, spotting patterns and predicting trends from data and sharing data responsibly.

4. Open Innovation — Open innovation describes the collaborative process of working across organisational boundaries to accelerate innovation by asking others for help defining or solving a problem. While originally used to describe how firms innovate using the external ideas of employees, suppliers and customers, open innovation has become common in public institutions.

It is sometimes called crowdsourcing, co-creation, ideation, brainstorming or public engagement. Open innovation skills include the ability to define a clear and compelling goal, determine appropriate incentives for participation, define the task for people to do and decide how to use their contributions.

5. Behavioural Insights — This uses insights about human behaviour from psychology, cognitive science, and social science to develop and test policies and services that encourage individuals to make better decisions. Behavioural insights involve understanding behaviours related to an issue, prioritising key behaviours to change in order to achieve an outcome, and empirically testing the effectiveness of strategies for behaviour change.

6. Lean-Agile — This describes a new way of working that is dynamic, evolutionary and iterative. It emphasises breaking down larger projects into smaller chunks. Instead of researching and planning a final product, policy or service from start to finish, practitioners "think small," develop projects incrementally and assess progress frequently, testing and iterating in ongoing feedback loops, allowing a small product or service to be developed quickly and tested. Successful projects are expanded while unsuccessful ways are discarded or substantially revised. Borrowed from the domain of software development, this describes a new way of working in policy and service delivery as well. Lean methodology includes defining a "minimum viable product".

7. Impact Evaluation — Impact evaluation assesses the causal relationships between the program, policy or intervention and the outcomes of interest. Identifying a counterfactual (what would have happened without the program) is the key characteristic of an impact evaluation. The process involves defining a theory of change, identifying a counterfactual, designing experimental approaches to test it, interpreting results and scaling lessons.

8. Evidence Synthesis — Evidence synthesis assesses what the academic and grey literature say about a policy or practice issue to inform policy-making. It involves a systematic review that identifies and critically evaluates research from various sources and disciplines. Evidence synthesis involves the development of a research question, the selection of criteria to search and select the research to be considered systematically, appraisal of the evidence and applying the findings.

9. Systems Thinking — This is a broad analytical approach that aims to uncover how the elements of a system are correlated and the dynamic relationships between them. It consists of identifying and understanding the relevant stakeholders, regulations, norms, structures and patterns that interact in a system. Systems thinking leverages quantitative and participatory approaches to model the systems or subsystems of interest.

→ **We wanted to assess whether people simply had familiarity with a concept or also knew how to apply a skill in practice.**

What We Learned

Given the voluntary response by self-selected individuals, participants in this survey are not representative of the public sector in Australia and New Zealand. Rather, respondents are likely to already work or be interested in public sector innovation, so selection bias is likely. The results shed light on the capability and practices of those already thinking about new ways of working in public sector. As a result, the conclusions are surprising because they still show a lack of knowledge of innovation skills and a startling absence of their use.

On average, respondents can explain to others only three out of the six skills that were presented to them. Those with a higher awareness of the innovation skill set tend to work directly on innovation and policy labs, behavioural interventions, technology and digitalisation strategies, and implementation of evidence-based strategies.

Of those who responded, most are familiar with — that is, can explain to others — the concepts of Behavioural Insights (65 per cent), Human Centred Design (62 per cent), and Problem definition (59 per cent). The least familiar of the nine skills are Systems Thinking (45 per cent), Impact Evaluation (46 per cent) and Open Innovation (51 per cent)

Similar to the level of awareness of skills, on average, respondents — or their teams — have used three out of six skills. Problem definition (60 per cent), Data Analytical Thinking (59 per cent) and Evidence Synthesis (56 per cent) are the skills that are most used, whereas Impact Evaluation (37 per cent), Behavioural Insights (41 per cent) and Open Innovation (44 per cent) are the least used.

Although we can observe a positive correlation between awareness and practice of the skill (see analysis in Annex I, section VI), there are wide knowledge-practice gaps for some skills (see Figure 8 and 9). Behavioural Insights is the skill with the biggest knowledge-practice gap, where many people can explain it but relative few use it at work. Other skills where we see a similar gap are Human Centred Design, Impact Evaluation and Open Innovation.

Figure 8 — Share of respondents that can explain the skill vs. share that practice the skill.

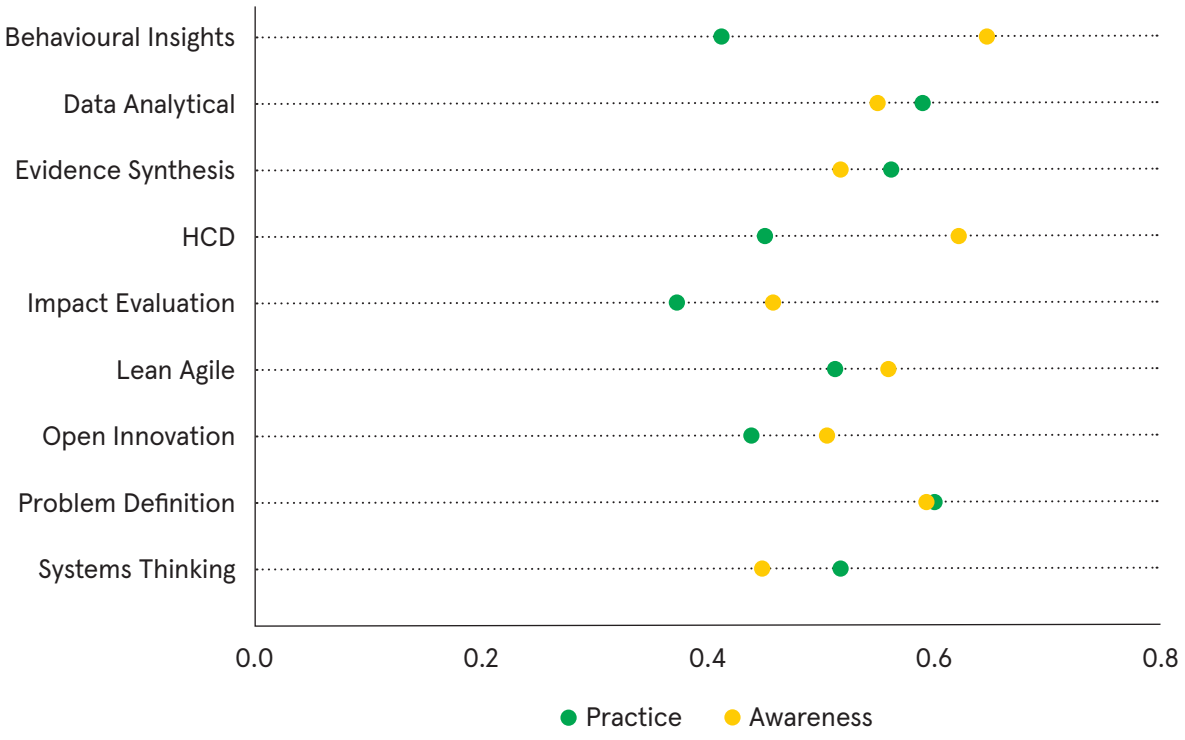


Figure 9 — Share of respondents that can explain the skill vs. share that practice the skill.

	N	Awareness	Practice	Gap (p.p)
Problem definition	249	59%	60%	-0.01
Human centred design	250	62%	45%	0.17
Data analytical	237	55%	59%	-0.4
Open innovation	227	51%	44%	0.07
Behavioural insights	241	65%	41%	0.24
Lean agile	226	56%	51%	0.05
Impact evaluation	219	46%	37%	0.09
Evidence synthesis	231	52%	56%	-0.04
Systems thinking	218	45%	52%	-0.07

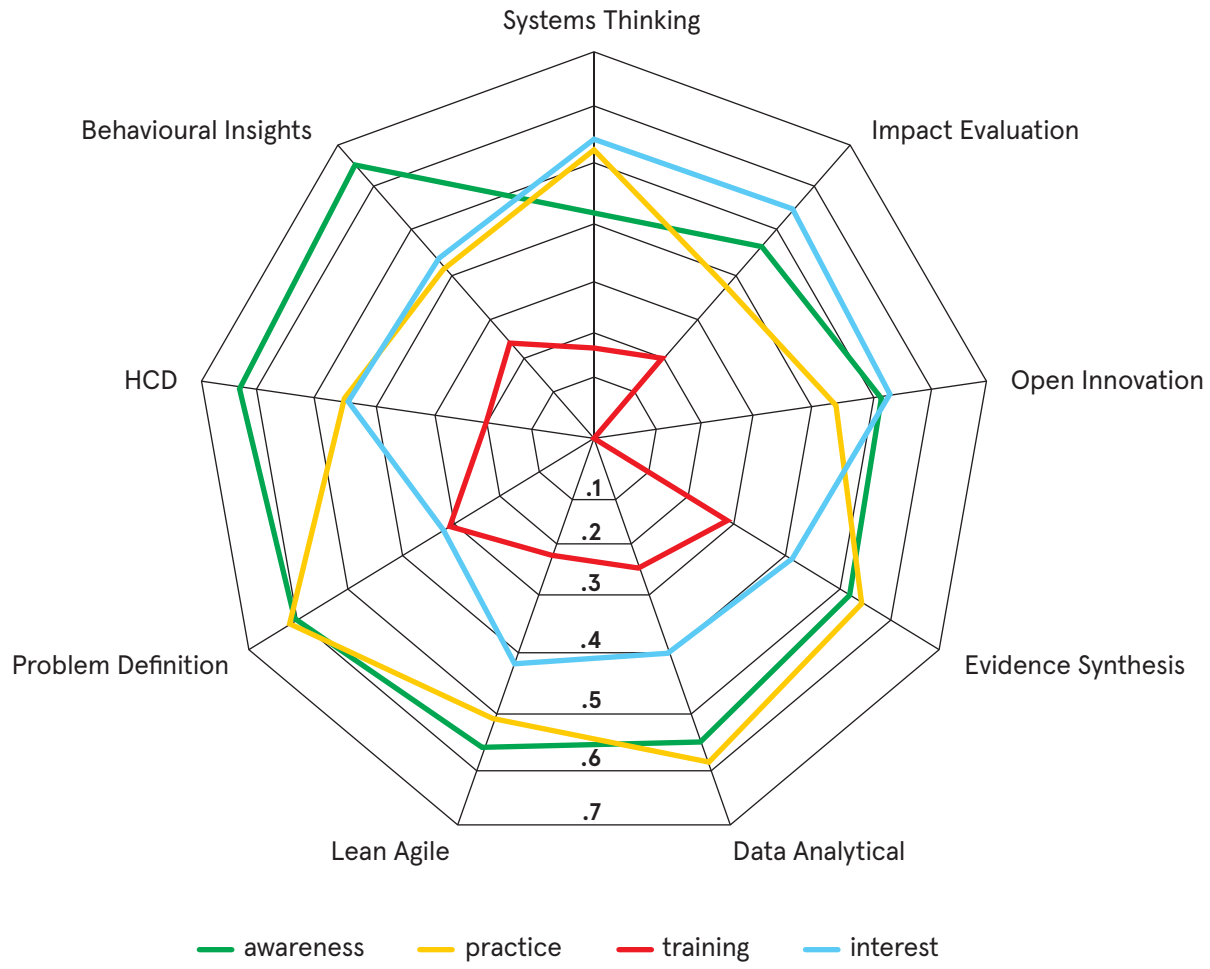
In addition to the survey, we also undertook interviews with innovation leaders. The findings from the interviews suggest that hands on training plays a key role in putting these skills into practice. The survey confirmed this hypothesis, showing that people with formal training have almost three times higher odds of practicing the skill than respondents without training (see analysis in Annex I, section VI).

In our sample, we find that there is a lack of training in innovation skills. On average, 60 per cent of the people have received training in at least one skill. However, the proportion of people trained by skill is very low, ranging from eight per cent to 30 per cent. Skills such as Problem Definition and Data Analytical Thinking, which have a larger proportion of people trained, have been learned mainly at university as part of a degree. Of the skills that are formally learned, 44 per cent of the time they have been learned in an academic institution, 27 per cent at work and 29 per cent of the time through other channels.

As one leader told us, "all public servants should have the basics of collaboration and a user-focus". These points were borne out in the survey findings, where we identified high demand for innovation skills training. The proportion of people who can't explain the skill and expressed an interest in learning one of the six skills they were asked about ranged from 50 per cent to 83 per cent. The skills in highest demand are Impact Evaluation (83 per cent), Systems Thinking (75 per cent) and Open Innovation (73 per cent).

Both the graph and the table below provide different ways of understanding the findings and show those who can explain, have used, received training in and still want to learn more.

Figure 10 — Those who explain, have used, have received training and are interested in learning the skill.



	Awareness		Practice		Training		Interest	
	N	%	N	%	N	%	N	%
Problem definition	249	59%	249	60%	248	31%	249	33%
Human centred design	250	62%	250	45%	248	20%	250	44%
Data analytical	237	55%	237	59%	251	25%	237	40%
Open innovation	227	51%	227	44%	247	8%	227	53%
Behavioural insights	241	65%	241	41%	250	24%	241	43%
Lean agile	226	56%	226	51%	245	22%	226	42%
Impact evaluation	219	46%	219	37%	250	20%	219	54%
Evidence synthesis	231	52%	231	56%	263	29%	231	41%
Systems thinking	218	45%	218	52%	248	19%	218	53%

How People Want to Learn

We also asked people to respond to six questions about *how* they want to learn:

1. For those innovation skills you indicated the desire to learn more about, please tell us where you prefer to learn and obtain training? (Check all that apply.)
2. For those innovation skills you indicated the desire to learn more about, please tell us more about how you prefer to learn and obtain training? (Check all that apply.)
3. What face to face formats would you prefer? (Choose one.)
4. What online formats would you prefer? (Choose one.)
5. Would you be interested in coaching/mentoring by subject-matter experts to help you advance your own work?
6. Please indicate features of innovation skills training programs that are important to you. (Check all that apply.)

The survey meshed with key themes from our expert interviews revealing an interest in training that takes on more diverse forms and approaches. The survey showed a need for more blended forms of training, and for training that involves learning, going home and working on a problem and then getting trained again.

When asked *where* they want to learn, an overwhelming majority of respondents expressed interest in obtaining training at work (90 per cent). The second most preferred option is at school or training site (69 per cent) followed by learning at home (30 per cent). The lowest proportion of respondents expressed interest in learning on their commute (23 per cent). This is an interesting finding, given that in Canada the federal government chose, specifically, to invest in training people on their commute.

When polled on *how* they want to learn, 79 per cent preferred face-to-face education (e.g. classroom-based) followed by online learning (e.g. online courses) at 65 per cent and with self-paced learning (e.g., reading list/toolkit) pulling up the rear (59 per cent). This suggests the need to create training in a variety of formats to appeal to different learners.

For those who preferred face-to-face learning, most would like either a one-day workshop (44 per cent) or multiple days spread out (36 per cent) and only one in five preferred multiple days in a row. For those who preferred online learning, most respondents chose the "short and often" format (81 per cent) compared to fewer but longer lessons.

But rather than traditional tutoring, respondents have a high interest in coaching or mentoring programs: 79 per cent expressed interest in help from subject-matter experts to advance their own work.

We also asked people to indicate which of 24 possible features of a training program were important to them.

Figure 11 — Responses to the question: "indicate features of innovation skills training programs that are important to you".

High relevance	Medium relevance	Low relevance
High quality content	Flexible start and end dates	Ability to receive credit
Clear understanding of skills I will obtain/what I will learn	Understanding outcomes for those who take the program	Getting credit at work for taking the program
Hands-on problem-based learning	Ability to work on project of my choosing	Learning with people from my own organisation
Instructors with a successful track record in practice	Flexible, self-paced schedule	Ability to receive a degree
Cost/affordability	High-quality peers/classmates	Internationally-renowned instructors
Learning with people across organisations	Clear communication to employers of skills I obtain	Domestically-renowned instructors
Convenient face-to-face locations	Diverse instructors	Accommodation for disabilities
Online learning options	Instructors with a strong theoretical grounding	Other

People could choose as few or as many as they wanted. The respondents' choices varied widely, with at least some people picking every one of the features as important to them. However, noticeable is that the most in-demand features were: "high-quality content" (chosen by 85 per cent of respondents), "clear understanding of skills I will obtain/what I will learn" (70 per cent), and "hands-on problem-based learning" (66 per cent). The features with the fewest selections were: "accommodation for disabilities" (8 per cent), "domestically-renowned instructors" (11 per cent), and "internationally-renowned instructors" (15 per cent).

Key Learning from the Survey

The survey sheds light on the magnitude of the knowledge gap, lack of training and demand for learning these innovation skills among public servants. Our data suggest that there are practice gaps at all levels in a range of skills that reflect user-centred, evidenced-based and system-level ways of working.

The disparities that were found between awareness and practice might reflect the lack of formal training and an environment that does not promote the use of these tools. **The demand for innovation skills training appears to be unmet; respondents in our sample expressed broad interest in learning these skills and very few indicated that they have received formal training**. Respondents are interested in learning these skills at work or at an education or training site and have a clear desire for coaching as a new modality for training. There appears to be an opportunity to build capabilities that promote the use of these skills, leveraging technology and modern ways of learning.

A detailed analysis of the survey responses and methodology can be found in Annex I.

THE INSTITUTIONAL ENVIRONMENT

Having explored the problem-solving skills of the individual public entrepreneur, we now turn our attention to how technology is generating a more adaptive, evidence-based and collaborative way of working, and enabling the emergence of a new class of organisations.

It is self-evident that the exercise of innovation skills depends not only on the capabilities of individuals, but on the environment in which they work. Our interviews confirmed that gaps in innovation practice are heavily shaped by organisational structures, incentives and cultures. For example, if an organisation does not check the outcomes of its policies, impact evaluation will not be in demand, and will have no impact if a team undertakes it. Similarly, a systems perspective will be harder to enact if narrow and tight accountability regimes discourage collaboration and innovation.

Institutions provide the enabling environment: As British sociologist Anthony Giddens argues, the evolution of social systems requires the analysis of both organisational structure and individual agency, with attention to both the institutional and the individual.[73] Lant Pritchett and Brian Arthur similarly argue for taking a more modular and granular view of systems through an intermediate or "meso" layer of analysis. This approach requires us to zoom in and out continuously, between macro and micro levels, structure and agency, and institutions and individuals.[74]

Institutions provide the guiderails within which innovative methods for public problem solving are exercised.

This perspective recognises the importance not only of generating new solutions but of embedding and scaling them inside systems or at the edges of systems, and ultimately transforming such systems. Success in this requires navigating complex social and political relationships.[75]

The imperative to change institutions as well as individual behaviour is bolstered by result of our survey. We asked survey respondents to express their level of agreement on 14 statements related to organisational practices. We asked whether their organisations supported the development of new ideas, the culture around the use of data, evidence and evaluation, and support for participatory and collaborative approaches (see Annex I, Section V).

To complement the survey, from May to July, 2019, MSDI and GovLab interviewed 14 Australian public service leaders (see Annex III), seeking their views on current and future innovation skill needs, and exploring how the organisational and institutional environment is affecting their work.

Interviewees both inside and beyond the public sector identified the risk aversion of middle management as a key constraint on innovation. They pointed out that there is greater risk appetite at both senior and junior levels, while middle management has become a deeply conservative place. However, that conservatism cannot be blamed on middle management alone. Cues from above impose constraints and encourage conformity, even or especially when making complex policy, undertaking staff development and relationship management.

In our survey, only 40 per cent of respondents agree with the statement that senior management is willing to take risks to support new ideas. One interviewee pointed to the "distinct lack of senior leaders prepared to put themselves on the line for the long-term view". **Both our survey and interviews point to the huge scale of the cultural transformation required across every level of the public sector.**

FEATURES OF INNOVATIVE INSTITUTIONS

We now turn our attention to three institutional traits, or what entrepreneurship expert Zoltan Acs calls "the role of the entrepreneur's context" that allow public problem solving at scale: the drive to be *adaptive*, *evidence-based* and *collaborative*.

Feature 1: Adaptive

Technology is creating the ability and incentive to work faster than in the past by working "smaller" and more iteratively in incremental steps on bigger problems. Too many projects do not work well, are delivered late, or are over budget. Government is infamous for its failed, over-budget projects. For example, the U.S. Air Force spent $1.1 billion of taxpayer dollars on an Expeditionary Combat Support System, a software project that was ultimately scrapped.[76] In Australia, the Collins Class Submarine is a similar tale of technical and management problems leading to cost overruns. Australia's Collins Class submarines are the most expensive in the world; the fleet of six submarines costs taxpayers $630 million a year to maintain, or $105 million for each submarine.[77] But technology has evolved to improve both outcomes and costs. Some organisations are moving away from large-scale "waterfall" projects, which require extensive information gathering and documentation followed by years of implementation without any evidence that the projects as defined will work in the end. Instead, these organisations are embracing agile, iterative and collaborative project management, not only for technology projects[78] but also for infrastructure planning under conditions of uncertainty.[79]

Let's look more closely at these three terms: *agile*, *iterative*, and *modular*.

Agile describes not so much a specific methodology but a new way of thinking about policy design and service delivery. Rather than developing a fully fleshed out and finished solution in the abstract before starting the implementation, agile refers to a willingness to try, fail, improve, and try again.

This approach mirrors today's fast pace of technological development. Software makes it especially easy to try something, test it out, see what works, and iterate. The emphasis is always on successful outcomes rather than following rules. An explicit willingness to iterate — and even fail — represents a potentially dramatic change in how government works.

This more modular way of working, borrowed from the tech industry, is also shaping the behaviour of more traditional forms of public administration, particularly as it seeks to implement new technologies.[80] Policymakers are borrowing many of the same agile techniques of software development, breaking down a larger project into smaller components that can be developed and tested in shorter time frames called sprints.

Take an example from Denmark. Instead of designing its new business corporation registration system in the old way, in which the next stage cannot start until the previous one finishes, Denmark developed the project in modular bursts with frequent testing of prototypes on real users. As a result, it was able to launch an online company-registration system faster and achieve better results.[81]

Agile approaches emphasise continuous building, testing, and learning from experience. Between 2004 and 2015, the adoption of agile approaches in many US agencies, along with changes in technology, reduced the length of major federal IT projects from an average of nine years to less than two years, with concomitant cost savings.[82] The major reviews of transport planning for London and Melbourne by Sir Rod Eddington similarly emphasise the larger returns to bespoke interventions that target particular system problems, compared to larger and longer-term projects.[83]

Some public officials, however, resist the agile model by trying to preserve their treasured roles as decision makers and conflict brokers. Without a doubt, agile approaches can threaten longstanding programs undertaken with established stakeholders. In cultures where change and failure are not the norm, any model that embraces "failing fast" will have trouble taking root. In the 2018 APS Employee Census, only 34 per cent of public servants agreed that their "agency recognises and supports the notion that failure is a part of innovation".[84]

Interviews for this study highlighted the practical tensions that arise when agile approaches meet Ministerial or Treasury demands to lock down projects with multi-year plans and budgets.

Feature 2: Evidence-Based

In a contested world, data is a powerful ally. For the public entrepreneur, data science is increasingly important for understanding problems and their root causes. The collection, representation, manipulation, visualisation, and publication of earlier, more conventional data sets offered a limited impact, but doing so with the size, diversity, and messiness of modern data is one of the great institutional opportunities of our age.

The 2018 Australian Public Sector (APS) Employee Census found that only 22 per cent of respondents worked often with 'client' related data in their current role, while only six per cent worked with geospatial/geographic data.[85] **Interviews for this study identified the enormous untapped potential of combining data sets across agencies and sectors in order to better manage large economic, social and environmental systems.**[86]

Our interviews supported the findings from our survey that evidence-based approaches are widespread (on average, 60 per cent of survey respondents agreed). However, they also suggested that the application of these approaches may be shallow. Interviewees observed major capability gaps at the front end (in critically interpreting evidence and data for strategic insight) and at the back end (in establishing quick feedback loops for policy development as evidence evolves and data emerges).

Feature 3: Collaborative

In order for the public entrepreneur to work across siloes and boundaries, her organisation must embrace the importance of working across organisational boundaries, as well as with citizens and experts outside government. This represents a drastic change from the past. As Mike Bracken, former head of the UK Government Digital Service, writes:

"We need to say, as public administrators, that we need to work differently and more collaboratively in a system that is not set up to do that. Whitehall was described to me when I started as a warring band of tribal bureaucrats held together by a common pension scheme, and there is something in that."[87]

Collaboration has arguably become the core skill requirement of the modern public service, yet its embrace does not come naturally. The problem is not merely the traditional Mandarin's arms-length stance designed to ward off undue influence, but also the failure of governments to name, promote and incentivise systemic and societal outcomes. **Our interviewees for this study went further, arguing that the struggle to collaborate reflects not merely the institution's capability and mandate, but a learned disposition among public servants to try to solve problems alone.**

There are examples of greater civic engagement in defining problems and solutions, akin to what is being done by the Seoul Innovation Bureau in South Korea.[88] By taking advantage of the widespread use of mobile phones, the city has made it easier for citizens to engage with and provide feedback and intelligence to government. Similarly, Taiwan has trained hundreds of public servants to become Participation Officers, who know how to work with citizens to solve problems together.[89]

There is compelling evidence that new digital technologies have amplified the sharing, matching and learning benefits that Alfred Marshall identified long ago in referring to trade secrets that were "in the air" in cities. **However, effective and widespread collaboration does not simply emerge organically. It must be deliberately set in train in order to meet the coordination, information and mobilisation challenges that public problems present.**[90]

Collaboration may work horizontally to target particular public problems (such as reducing emissions), or vertically to bring particular innovation capabilities (such as useful evidence) to a range of public problems.

Both approaches recognise that tacit knowledge is "sticky" and that it diffuses slowly, partitioned by task.[91] Therefore, communities grow based on affinity, cultural norms and shared practices, aided by the Internet, alongside the traditional geographic notions of distance that explain "gravity models" of urban development and international trade.

Our survey confirms that collaboration decreases with organisational distance. While 64 per cent of respondents agreed that their branch collaborated with other branches in their agency, the proportion fell to 49 per cent for collaboration with other agencies and 31 per cent with other sectors.

The insular disposition of the public sector is also revealed by the limited use of participatory approaches such as open innovation, as our survey shows. More broadly, our interviews suggest a near-absence of the systems perspective and reveals the imperative for collaboration.

This finding reaffirms the large gaps in strategic commissioning identified by O'Flynn and Sturgess in their report for the APS Review.[92] Our interviews underscores that all stages of the public-making process require collaboration and a range of innovation methods.

For instance, it was observed that even a perfectly co-created and iterated policy process is quickly undermined when it encounters the government procurement process. An underlying challenge springs from different innovators' predilections within the public sector to promote their own approaches — some slow and systemic, some fast and adaptive — as the panacea for all contexts.

NEW INNOVATION INSTITUTIONS

Around the world, examples of new kinds of adaptive, evidence-based and collaborative institutions are emerging. These are creating alternative "safe spaces" for innovation skills and new approaches to public problem solving.

Working in a more adaptive, evidence-based and collaborative fashion requires organisations to operate differently. Sometimes it requires entirely new organisations with the mandate to think and work differently.

Adaptive Institutions: The Labs

There are many examples of more innovative institutions that are cultivating new ways of working. Many governments have created separate, stand-alone departments to explore these opportunities. They go by such names as policy labs, innovation labs, public labs, or living labs. Many of these hire people with skills such as data science, design and anthropology, which are not common across the public sector. Labs enable these experts to practise their methods more easily than the rest of the bureaucracy, as they seek to work and think more like startups.[93]

UN Global Pulse is an experimental unit within the United Nations, designed to provide agile data science expertise for tackling the Sustainable Development Goals. In the United Arab Emirates, the Mohammed bin Rashid Centre for Government Innovation has established a formal experimentation methodology to accelerate the development of innovative new policies and services. Through the "Afkari" investment fund, the UAE government invests in the innovative ideas of public servants.[94]

Many public agencies are trying to shift away from a rules-based compliance culture led by lawyers and accountants, and towards staffing plans that include engineers, designers, technologists, and a culture that encourages experimentation by creating internal skunk works designed to work differently.[95]

Although their methods differ, all these experimental organisations seek to accelerate the rate and improve the effectiveness of problem-solving. In an effort to shift from a top-down decision-making culture, the UN Development Programme in 2019 is setting up 60 Innovation Accelerators, all designed to create safe spaces for creative and distributed experimentation within larger, more conservative bureaucracies.

Such organisations are engaging both with specific local problems and with the context in which these problems exist. While the organisations are locally rooted, they engage actively with relevant expertise and experiences from around the world.

Experimentation units focus most often on a particular sector. For example, the Swedish national government set up Experio Lab to focus designers on healthcare challenges. In Denmark, between 2002 and 2018 MindLab helped the public sector employ designers

to engage citizens in the design of services. For example, MindLab ran a project to coordinate the input of 400 teachers to redesign the country's school curriculum.[96]

Policy labs have also sprouted in Australia, growing from just a handful to over 20 in the past three years. These labs vary in maturity, scale and sophistication, but their momentum is growing. While their remits vary widely,[97] it has been suggested that labs have focused primarily on identifying problems, generating ideas and piloting solutions.

Our interviews pointed out that although a good deal of attention has been paid to labs, the public sector has neglected deeper skills in both strategic policy and implementation. One interviewee quipped that "policy is the new HR", while another lamented the lack of practical experience within senior public sector ranks.

Public sector leaders interviewed as part of this project suggested that state governments appear better placed to innovate than the Federal Government. They argue that because states face less institutional, media and civil society scrutiny than national governments, they have more room to move. They also deliver more direct services to citizens and thus have more impact on practice. This provides the flexibility and opportunity to test a range of solutions that are more reflective of local circumstances.

Some interviews for this study recommended that the Federal Government think more strategically, academically and globally, while state governments think more pragmatically, experimentally and locally. This is not borne out by our survey findings on the use of innovation skills. The nuanced roles of the two levels of government, with their overlapping responsibilities in many areas, and the backdrop of both globalizing and localizing forces, suggest a more complex relationship.

Although labs in Australia make significant use of outside contractors and consultants, there is limited evidence of capability transfer. Mainstream procurement and hiring processes make it difficult to bring technologies and talent quickly. Moreover, despite some notable exceptions, labs seem to hire few people with deep experience beyond the public service.

This fact, combined with limited training in innovation skills, may explain what appears from our survey to be a shallowness in the public sector's understanding of innovation methods. This shallowness may be interpreted in two ways. Some academics observe that the use of behavioural science is still largely limited to more basic 'nudging' and choice architecture, rather than the more advanced practices of experimental research and knowledge brokerage.[98]

The alternate view suggested by our interviews is that it is precisely because adopting the principles of behavioural science is so easy that the field is gaining more traction than human-centred design, data analytics and agile methods. The basic principles of behavioural science are easily taught (evident in the thousands of public servants learning them every year), its impacts are often direct, visible and marketable, and it does not ask public servants to radically rethink how they work.

Australia's labs rarely work across disciplinary, geographic and sectoral boundaries. A notable exception is the Evidence and Evaluation Hub, convened by ANZSOG, which works across government agencies, levels of government and sectors (including the not-for-profit sector). ANZSOG's span across governments and sectors may provide further opportunity to convene innovation and learning at scale.

While the New South Wales and Victorian central agencies are embracing whole-of-government networks for behaviour change and data analytics, most labs are focused on one capability *within* just one department. They typically seek to build the bonding capital within their particular community of practice (whether it be human-centred design, data analytics or behavioural science). There have been few attempts to bridge capabilities, although the Behavioural and Implementation Science Institute (BISI) at the National University of Singapore attempts to combine behavioural science and implementation capabilities.

In the debates over innovation skills, very little attention has been paid to bridging capital across the communities required to solve public problems. Interviews for this study highlighted the risk of propounding one particular method over a holistic approach to public problem solving.[99]

It is notable that Australia lacks a national institution with a mandate to promote public problem solving, as Nesta does in the UK and Sitra does in Finland.[100]

Evidence and data at scale: The Hubs

The United Kingdom's **What Works Network** of 11 policy research centres considers how to use evidence, experimentation and evaluation to improve policy and practice relevant to particular public problems.[101]

These What Works Centres, which are partnerships of academics, policymakers and practitioners, connect policy communities of interest and practice. The centres aim to support decision makers by synthesising, translating and sharing evidence. They incorporate a curated, qualitative approach that integrates practitioner insight with the use of data and evidence in order to drive performance, innovation and learning.

The key features built into the What Works Network are instructive for policy-makers intent on designing such institutions for broader application. These features seek to improve the supply and use of evidence in key fields of policy and practice, to assess the quality of relevant evidence, to advise on new programs, and to present and share findings in an easy-to-understand form. The centres remain independent from policy and practice, but are close enough to have an impact, and exploit the rapid progress in opening up public data.[102] Their approach strengthens accountability, provides rapid insights and makes these insights visible to policy-makers.

The British Cabinet Office and local actors are promoting an Evidence Quarter that would physically co-locate expertise relevant to the network of What Works Centres, including related research and consultancy expertise, in order to make the most of potential network effects (as described earlier).[103] The introduction of an Evidence Quarter would recognise the growing interest in more advanced **implementation science**, which explores in detail how changes in practice require understanding specific barriers to change, not merely the sharing of evidence.

In Australia, despite discussing such evidence-based mechanisms for more than a decade, governments have consistently failed to institutionalise them.

New Zealand, by contrast, was an early pioneer in the use of evidence and data in policy. Its Productivity Hub (convened by the Productivity Commission) and Social Services Hub (convened by the new the Social Investment Agency) are bringing together evidence and data for better practice and policy insight into economic and social systems.

In addition to these Hubs, two further green shoots that bring data and evidence closer to policy are data collaboratives and regulatory sandboxes.

Data collaboratives, in which companies publish private datasets for public use, are another emerging form of collaboration between public and private institutions. For example, BBVA bank, the main financial institution in Mexico, provided the United Nations Global Pulse agency with anonymised and shared credit card sales and ATM cash withdrawal data from more than 100,000 of its clients. The collaboration sought to use financial data to measure the resilience of communities following a natural disaster. Researchers found markedly different rates of economic recovery, with significant disparities based on income levels and gender.[104]

Data collaboratives come in many forms and increasingly demonstrate new opportunities for sharing data, talent, and problem-solving capacity across sectors. An application directly relevant to the public sector involves the NSW Government's use of data analytics and expert engagement to develop scenarios for the impact of new technologies on the future public sector workforce. This involves bringing together data from a range of sources in order to seek to make sense of change that is both inherently uncertain and critical to the future of the public sector.

A further form of experimental organisation is the *regulatory sandbox*. Regulatory sandboxes introduce legal and regulatory experimentation into the regulatory process, thus enabling new forms of learning from experience that can ultimately inform policy.[105] They do this by relaxing or waiving the rules businesses must comply with for a period of time, enabling them to test new products and services free from regulatory constraints or burdens. This approach helps a business to reduce the time and cost needed to bring an idea to market while facilitating the testing necessary to protect consumers. The jury is still out, however, as to how governments best use them to protect consumers while liberalising business opportunities.

Regulatory sandboxes have been implemented in several countries and proposed in several others.[106] For instance, Britain launched a regulatory sandbox in 2016 that enables financial technology start-ups to road test products. Companies apply to be part of a six-month testing cohort. The UK Financial Conduct Authority reported: "By supporting individual firms get to market, we believe that this creates positive competitive pressures on existing firms to evolve and improve their offering, creating more positive outcomes for consumers, such as lower cost and higher quality products and services."[107]

Although financial technology has led regulatory experimentation, testbeds are emerging in other fast-developing fields such as mobility and transportation. For instance, the UK has created a Regulatory Pioneers Fund consisting of £10 million to invest in 15 projects in order to unlock technological advances, from AI-lawyering to flying taxis.[108] Although such approaches offer much promise, in most countries they remain confined to a few areas of innovative economic development.

Collaborative Institutions: Missions

Sometimes, new institutional arrangements can pave the way for new ways of public problem solving. Two examples, set out below, illustrate how new arrangements can embrace a population-wide, forward-looking perspective to solve problems collectively and at scale.

The Victorian Transport Accident Commission

In 1969, more than 1000 people died on Victoria's roads. By 2016, the fatality rate had been cut by 85 per cent. This achievement reflects a long list of innovations to prevent injury, save lives and optimise recovery, underpinned by a whole-system approach that has since been extended to other trauma-related areas, and emulated around the world.[109]

The Transport Accident Commission (TAC) has a goal of zero deaths and serious injuries on Victoria's roads. Guided by a public mission to be the world's leading social insurer, it has used its population-wide mandate and secure long-term funding (via compulsory third-party motor accident insurance) to develop, test and evolve a portfolio of interventions.

The Commission targets and monitors system-level outcomes, employing a state-wide data registry and dedicated research agenda to support decision-making. Bipartisan political support has enabled continuous experimentation and innovation to reach beyond direct policy and healthcare to affect road construction, vehicle safety and public attitudes.

The TAC story shows how systems can be shifted when a range of initiatives from a range of actors is mobilised. The changes introduced were not only incremental, but after the establishment of trust in the process, also radical.[110]

Japan's Society 5.0 — looking into the systems of the future

Japan's National Strategic Special Zones (NSSZs) offer a glimpse of what might lie beyond the regulatory sandbox concept. Since 2013, 10 regions of Japan have been permitted to test regulatory reforms targeting sectors and missions ranging from healthcare, education, agriculture and tourism to business startups and social inclusion. The goal is to extend successful trials nationally. For example, the testing of home delivery of prescription drugs in three zones in 2018 has already led to a planned nationwide rollout in 2020.[111]

The next phase of the program will see regions engage with Japan's new **Society 5.0** vision of a technology-based, human-centred society. Society 5.0 seeks to apply Industry 4.0 technologies, such as the Internet of Things, big data, artificial intelligence, robotics and the sharing economy, to systemic and societal challenges.[112]

Japan appears ready for such boldness.[113] Its cities and regions pro-actively compete on the basis of their reform credentials, while the country's governance arrangements provide the Prime Minister with the authority to resolve cross-portfolio reform disagreements. Japan's people and businesses engage actively with new technologies and after a long period of economic stagnation, are well aware of their national challenges.

While the Society 5.0 rhetoric evokes digital thinking — with its scalable collaboration, experimentation and modularity language — most interesting is its societal framing: "a combination of the digital transformation and the imagination and creativity of diverse people will make it possible to solve the problems facing society and create new value".[114]

TAC and Society 5.0 bring a systemic and societal perspective to challenges, reframing public problems with narratives that combine policy and governance, a diversity of actors, skills, relationships and new technologies. While quite different in scope and focus, both represent what one interviewee described as the fundamental systems need in Australia, "**to think a new whole, not just its parts**".

POLICIES TO CATALYSE INNOVATIVE INSTITUTIONS

Think bigger.

Mission-oriented innovation — sometimes called "moon shots" — provides a further approach to generating change at scale. This controversial approach proposes large-scale initiatives, generally catalysed by governments, that are designed to address audacious challenges.[115] Missions are intended to inspire innovators, develop solutions to big public problems, and generate enthusiasm for public problem solving at scale. These are often anchored in a larger framework of goals, such as the UN Sustainable Development Goals.

Missions exemplify the meso-level approach to problem-solving, with their system-wide and long-term lenses. They start by stepping back and setting a *clear direction* for the problems to be solved, before eliciting cross-sectoral investments and multiple bottom-up solutions, of which some will inevitably fail. Too much of a top-down focus stifles innovation, while too much of a bottom-up focus struggles to gain traction.[116]

Economist Mariana Mazzucato proposes that many of our public problems can be reframed as missions. She argues that problems should be broad enough to engage the public and attract cross-sectoral investment, but focused enough to engage actors and show measurable impact.[117]

The Innovation and Science Australia (ISA) 2030 Roadmap also recognised the importance of mission-driven innovation:

Tackling our national challenges is not the job of governments alone. Australia has a world-class pool of researchers, and an increasingly powerful technological toolkit, created by concurrent improvements in the performance and cost of complementary technologies such as genome sequencing, low-carbon energy, machine learning, AI, optimisation, visualisation, sensors and robotics.

The ISA Review team proposed a framework for national missions based on national capabilities and interests, choosing areas where potential exists to create a step-change in innovation capabilities and culture.[118]

Mission-driven organisations create safe spaces to convene difficult conversations, seek solutions that cross siloes and sectors, and combine innovation methods as needed. Such dedicated organisations have been shown to be more effective than mainstream ones, in much the same way that small nations often navigate global forces with greater coherence and agility than larger ones.[119]

Such organisations are charged with transforming particular systems, not merely through incremental changes but also, as trust is established, by building support for more radical reforms. They actively engage big data and collective intelligence to make systems visible and their transformations feasible. In Australia,

these organisations have also had distinctive finance, insurance and investment characteristics, building on a local tradition of financial innovation in mining, agriculture and social policy.

For example, the Clean Energy Finance Corporation (CEFC) has a mission "to accelerate Australia's transformation towards a more competitive economy in a carbon-constrained world, by acting as a catalyst to increase investment in emissions reduction." It does this by investing in businesses and projects that are solely or mainly Australian-based, across sectors and communities with the highest potential to contribute to emissions reduction.

With a mandate to accelerate system transformation, the CEFC acts as a steward of the system, drawing on a wide range of strategies, instruments and partnerships. To shift the flows of finance into the clean energy sector, among other things, the CEFC shares its insights and expertise with project sponsors, co-investors, public sector agencies, and the public.

It directs its investment portfolio of $10 billion towards the achievement of its public mission. This mission justifies a broad strategy that catalyses emissions reductions, moves new technologies down the cost curve, drives productivity gains through energy efficiency, ensures technology diversity in the energy mix, and supports innovation, capacity building and leveraging private sector contributions.

Another example is the Medical Research Future Fund (MRFF), designed to accelerate medical research and technology development in order to fast-track medical discovery and improve health care. The focus of one stream of the MRFF program on large-scale national missions brings a systems perspective to complex health challenges that are increasingly pursued through cross-sectoral partnerships — for instance, with Australian Genomics and with Dementia Australia.[120]

By 2020-21 the MRFF's endowment will fund investments of $650 million per year. The government bases investment decisions on strategies and priorities identified by an independent Advisory Board. Although the MRFF is well designed, its autonomy has been questioned by revelations that expert advice and political decisions do not always align.

A further prominent example is the National Disability Insurance Scheme (NDIS). It takes a lifetime approach to assisting people with disabilities, with an emphasis on investing early to improve outcomes later in life. In this sense, it seeks to emulate many of the social insurance features of the TAC model. NDIS allocates a dedicated public funding pool among individuals with permanent and significant disability under the age of 65, to enable them to develop individualised plans for supports and services.

A National Disability Insurance Agency administers the scheme, overseen by the COAG Disability Reform Council. Notably, the new scheme has consolidated responsibilities and pooled funding across Commonwealth and State Governments. The NDIS, legislated in 2013 and expected to be in full operation by 2020, has faced a range of strategy and implementation challenges involving the agency's limited capability to steward the system, the disputed role of private providers, impacts on the sector's workforce, reduced access for some clients and the automation of support services.

The CEFS, MRFF missions and NDIS each bring their own lenses (and biases) to the systems transformation task — being finance-led, research-led and market-led, respectively. While they have all achieved partial success, they have also illustrated the complexity that can beset strategy and implementation in the desire to transform systems.

TALENT MOBILITY: MOVING BRAINS AROUND

Ricardo Haussman of Harvard University argues that one of the most effective ways to accelerate innovation and learning in systems is to "move the brains around". Today, just as some public servants are turning to open innovation and human-centred design to work more openly, some public agencies are shifting away from closed and insular hiring practices to more networked ways of working across sectors.

In the technology sector, mobility is a fact of life. At Facebook, the average employee tenure is 2.5 years.[121] The average stint of Uber staff is only 1.8 years. Berkeley professor AnnaLee Saxenian has extensively documented how high turnover rates and moves between institutions in Silicon Valley catalyse an exchange of knowledge and dissemination of ideas. She credits this mobility for the region's high rates of growth and innovation. As she puts it: "Job-hopping, rather than climbing the career ladder within a corporation, facilitates flows of information and know-how between individuals, firms, and industries. When combined with venture capital, it supports unanticipated re-combinations of technologies and skill."

Whereas it was once believed that the great attraction of government work was long tenure and a relative lack of mobility, some public institutions are changing their organisational dynamics and allowing exchanges, sabbaticals, and shorter-term stints.[122] At the start of his first term, President Obama ordered agencies to accelerate the hiring process with the goal of eventually processing applications and hiring a new worker in no more than 80 days (still shockingly long) in an effort to get in more talent from outside government.[123]

Many public institutions are exploring new forms of talent exchange designed to bring fresh ideas into government, recruiting those outside of government with cutting-edge experience to work on public problems. The Italian government, for example, recruited the head of Amazon Europe, Diego Piacentini, to spend two years from 2016 as Government Commissioner for the Digital Agenda. The team Piacentini brought to join him included people from the private sector with experience in computer science, product design, and big data. All were asked to commit to a one-year stint "on the inside."[124]

Both Mexico and the United States launched a Presidential Innovation Fellowship to encourage the best and brightest, especially those with skills such as computer science and design that are less likely to be found inside government, to serve in the public sector for one year. Because her stint in government is time-limited, the shorter-term appointee has a greater sense of urgency to use the opportunity.

While places as diverse as France and Korea are experimenting with inviting people into government, the UK is encouraging civil servants to leave government for a "career break."[125] Scotland and Ireland, too, offer sabbaticals.[126] The cities of London and New York have held "innovation exchanges" to learn from one another about their methods of combatting climate change and congestion.[127] However, there is a reason these are organised by outside groups. Rapid hiring, collaboration, and exchange are still very difficult to accomplish inside government.

→ **Today...some public agencies are shifting away from closed and insular hiring practices to more networked ways of working across sectors.**

Job-hopping and collaboration across agencies, let alone across sectors, is still far from the norm. A recent study of European innovation agencies concluded that "few European innovation agencies currently employ staff with data skills, design backgrounds or expertise in strategic foresight, although most identify these as being important skills to recruit for in the future".

Anne Tiernan and colleagues suggest that past reforms in Australia have created a more generalist and managerial APS overall, in which subject matter policy expertise is less valued, and staff turnover and mobility between departments is higher.[128] Our evidence suggests that the story for more specialised innovation skills may be more nuanced.

Many of the innovation skills needed for public problem solving are more prevalent in the private than the public sector.[129] Our interviews suggested that the private sector was far more open to using new methods.

It is not the case that people with new skills are totally avoiding government. Australia's public lab leaders, for example, have specialist expertise in areas such as design and open innovation. In areas with momentum such as behavioural science, mobility in and out of government is high. New approaches are also gradually drawing on new methods — such as what James Mansell describes as "curating the social commons", and what Yochai Benckler describes as the "creative and cultural savvy" required to communicate digitally with a positive impact.[130]

When the public sector attracts people with new expertise, it not only diversifies the sector's skillset, but underpins the potential for more holistic problem-solving approaches. Given this, it is surprising that the Australian public sector still appears to make limited use of flexible work options such as "tiger" teams that come together for specific projects then disappear, or expert mentors (even reverse mentors) that work part-time to support public servants on difficult tasks.

Our interviews suggest that support for new and specialist innovation skills is squeezed by the use of blunt public sector management tools. Hiring freezes, which often exclude frontline and/or regional staff, produce a stagnant public sector, as staff seek security in their current roles and defer from new ones. When facing efficiency dividends, innovative or experimental initiatives are often the target most ready at hand for managers, while cutting travel budgets for stakeholder engagement directly undermines collaboration.

Our interviewees for this study see in this a creeping crisis for the public sector. That is to say, it may not be a burning issue today but the failure to address will, in the long run, force collaborative and creative people out of public service with detrimental long-term consequences.

More generally, our interviews reveal a lack of clear responsibility for the skill set of the public sector workforce. Formal reviews reinforce the power of the Secretaries Group. With a few exceptions, agencies acting in isolation appear to have insufficient stake in the scale of change required, while the mandate of public service commissioners is unclear and their resourcing limited.

Our research suggests that this confusion has led to inertia. The public sector lacks a coherent learning system, from learning design standards and credentials, to program offerings, to the mechanisms that manage talent development, mobility and utilisation. While individual jurisdictions have their own strategies, these are disconnected.

SUSTAINING INNOVATIVE INSTITUTIONS

Some researchers and practitioners question whether new organisational forms can succeed against traditional bureaucratic norms and today's overzealous probing for problems by media outlets.[131] There is, indeed, some evidence that the impact of new organisational forms may be temporary. Beyond a certain scale and visibility, new bureaucratic or political leaders want to either claim them as their own and reshape them in their own image, or kill them off in order to pursue their own agendas.

One of the most lauded and effective labs, MindLab in Denmark, went out of business after sixteen years in operation. The once-celebrated public labs in Bogota and Mexico City both closed in 2018.[132] Some suggest that these innovation outposts, by virtue of being small, failed to yield the desired impact. Another view is that these exemplary institutions couldn't last because their toolkits for change were too limited. As discussed earlier, MindLab actively practised and promoted human-centred design, but did not build digital tools, making it out of date for the 21st century. Finally, others suggest that such experimental units, by showing how to do things differently, threatened established powers.[133]

The experience of Australia's Digital Transformation Office (DTO) — later to become the Digital Transformation Agency (DTA) — is instructive in this respect. The DTO concept, borrowed from the successful Government Digital Service in the UK, initially met enthusiasm. However, bureaucratic politics and the practicalities of service delivery in a federal system soon imposed reality checks. As it encountered difficulties, the DTO was increasingly undermined, and its successor the DTA may yet be integrated into a new, more powerful agency, Services Australia. Whether this new agency will work nimbly and with states is yet to be seen, but the track record of federal agencies doing so does not inspire confidence.

A paradox with labs is that the most successful tend to do what others in the public sector cannot do, but as they try to spread their effort and scale their influence, to become "effective upgraders", they lose their radical edge.[134]

In part, this may be why entirely new institutional arrangements with a systems mandate may be more effective. However, even institutions moving in this direction, such as the CEFC, MRFF and NDIS, have faced threats to their sustainability. In 2014 a new Coalition government threatened to abolish the CEFC, and only the votes of cross-benchers in the Parliament saved it. The organisation was then directed to stop funding wind energy and some solar projects. The MRFF continues to be criticised for its Ministerial decision-making. And the NDIS has seen its rollout and funding timelines reshaped as design flaws and political pressures have become evident with implementation.

Such struggles should not be surprising. As Danish polymath Piet Hein noted, *"problems worthy of attack prove their worth by hitting back"*. Mission-oriented institutions operate in contested and uncertain environments. A key factor in their success will be the ability to withstand and adapt to the inevitable threats to viability as implementation unfolds and political contestation arises.[135]

What is perhaps most remarkable is that to date these institutions have survived resistance and adapted. How they evolve over time will illuminate the observation of Janine O'Flynn and Gary Sturgess of Australia's reform landscape:

Another way to think about this it to differentiate between strategic and tactical commissioning; the former being system-wide and focused on longer-term considerations, while the latter is on individual actors and/or short-term processes. In this way, Australia's commissioning focus to date may be largely tactical rather than strategic.[136]

To interpret the examples above optimistically, Australia is in the early days of employing its finance, insurance and investment expertise to pursue public missions and give effect to this call for more strategic commissioning. We see much promise in extending this approach to other sectors, systems and public policy problems.

CONCLUSION: LOOKING TO TOMORROW

This report has argued that, by and large, **public servants are being asked to solve today's public problems with yesterday's toolkit**. Although new innovation skills are gathering momentum, they have not yet pervaded government practice. New forms of training are needed to expand the pool of public entrepreneurs who can be innovative in solving public problems and take advantage of technology to deploy new problem-solving skills. To expand the use of this new toolkit and unlock the potential of public entrepreneurs, experiments in alternative institutional arrangements are required.

We propose three sets of recommendations to enable more public servants to become public entrepreneurs, and to unlock their potential:

- **Developing a 21st century toolkit for public problem solving, and a new pathway for problem solving that puts this toolkit to work.**
- **Designing more effective skills training, coaching and mentoring programs, informed by leading practices from around the world.**
- **Encouraging institutional experimentation, in a variety of forms, to enable innovation skills to be shared and deployed.**

→ **New forms of training are needed to expand the pool of public entrepreneurs who can be innovative...**

A 21st century toolkit for public problem solving

We recommend developing a 21st century toolkit, starting with the nine core innovation skills outlined in this report. These skills would be developed as part of a new pathway for public problem solving:

1. **Define actionable and specific problems**
2. **Use participatory and human-centric practices**
3. **Use data analytical methods to quantify complex problems**
4. **Design solutions together by leveraging collective intelligence**
5. **Learn to implement measurable solutions.**

We recommend an approach that develops not only communities of practice around particular innovation skills, but also a wider expectation that all public servants will have a basic grasp of the full range of innovation skills, as well as an understanding of where and when they are best deployed.

More relevant and effective training programs

We recommend adopting 10 global lessons in effective innovation skills training. To empower more public servants to become public entrepreneurs, it is proposed that training programs:

1. **Survey people: Assess what they want to know and how they want to learn.**
2. **Go hybrid: Create face-to-face and online training opportunities.**
3. **Teach both quantitative and qualitative skills: The best training programs teach data and design together, rather than exclusively one skill.**
4. **Turn students into teachers: Use alumni as mentors.**
5. **Strive for scale: Train more people in more diverse roles.**
6. **Focus on sector specific innovation: Teach public problem-solving in specific as well as general domains.**
7. **Coach: Don't just train people in the abstract, but coach them to take a project from idea to implementation.**
8. **Train citizens as well as civil servants: Create more public problem solvers.**
9. **Use citizens as trainers: Leverage public know-how to improve offerings.**
10. **Teach problem-solving skills: Strengthen public entrepreneurship.**

To take account of the factors that people consider important, we recommend a broad range of improvements to training. These improvements include offering online learning and flexible, self-paced formats and timing. They also involve shifting from passive forms of training to more active hands-on coaching in problem-solving.

Encouraging institutional experimentation

We recommend ongoing experimentation with alternative organisational forms that unlock more innovative ways of thinking and working. To complement the broad-based reforms to curriculum and pedagogy proposed above, institutional experimentation would:

1. **Monitor new organisational forms such as policy labs, and share evidence and data through hubs, collaboratives and sandboxes.**
2. **Enable leaders in innovation skills to work across organisations and sectors, including through temporary and part-time options.**
3. **Encourage the formation of further collaborative, mission-oriented organisations tasked with whole-of-system transformations.**
4. **Allocate clear responsibility for the development and exploitation of public sector workforce skills by engaging with ANZSOG and the Public Service Commissioners.**
5. **Explore the merits of an overarching national institution, such as Nesta in the UK or Sitra in Finland, with responsibility for advancing public problem solving.**

We recommend introducing diverse forms of institutional experimentation, but with a view to bringing greater coherence to new adaptive, evidence-based and collaborative approaches, and forging alternative environments to the risk-averse and silo-based cultures now entrenched in much of the public sector.

The scale of the changes is not small. But the consequences of inaction could hardly be larger or more serious. The perfect storm surrounding public sector innovation, with declining trust at its core, calls for a radical reimagining of the role of government and the public servant.

Without such a reimagining, the public sector risks losing its most collaborative, creative and empathetic people, who simply want to be empowered to solve problems and advance the public good. With imagination and courage, immense opportunities are available to reinvent government for the 21st century by building on the skills and dedication of the public servants who work in it, and by focusing ever more clearly on the needs of the millions of people government is meant to serve.

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We also wish to thank the hundreds of public servants who graciously and generously gave of their time and insights to respond to the survey or be interviewed for this report. A complete list of those interviewees can be found at Annex III.

The views represented are those of the authors alone, and do not represent official views of ANZSOG or other contributors.

ANZSOG

About ANZSOG

The Australia and New Zealand School of Government (ANZSOG) works for our government owners and with our university partners to lift the quality of public sector leadership across both nations. We are a global leader in education and research that supports outstanding leadership and enriches the public sector. Our work inspires and connects people across agencies, sectors, jurisdictions and nations. Everything we do helps to deliver better government which means better outcomes for citizens.

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Monash Sustainable Development Institute is a global hub for interdisciplinary research and education in sustainable development. We're harnessing the research and education strength of Monash University in partnership with the best thinkers and doers from across academia, industry, government and civil society to help achieve the United Nations 17 Sustainable Development Goals. We work with over 200 local, regional and global partners to transform society's response to the environment, economic and social challenges facing the world today.

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GOVLAB

About The GovLab

The Governance Lab's mission is to improve people's lives by changing the way we govern using new technology. Our goal at The GovLab is to strengthen the ability of institutions — including but not limited to governments — and people to work more openly, collaboratively, effectively, and legitimately to make better decisions and solve public problems. We believe that increased availability and use of data, new ways to leverage the capacity, intelligence, and expertise of people in the problem-solving process, combined with new advances in technology and science, can transform governance.

www.thegovlab.org

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Professor Beth Simone Noveck directs the Governance Lab (GovLab) and its MacArthur Research Network on Opening Governance. New Jersey governor Phil Murphy appointed her as the state's first Chief Innovation Officer in 2018. Previously, Beth served in the White House as the first United States Deputy Chief Technology Officer and director of the White House Open Government Initiative under President Obama.

At the GovLab, she directs better governance programs, including work with public institutions on public engagement in lawmaking (CrowdLaw), expert-sourcing innovative solutions to hard problems (Smarter Crowdsourcing), co-creation between cities and citizens (City Challenges). She also coaches "public entrepreneurs." working with passionate individuals to take their public interest projects from idea to implementation.

Beth is the author of *Smart Citizens, Smarter State: The Technologies of Expertise and the Future of Governing* (Harvard Univ Press 2015) and *Wiki Government: How Technology Can Make Government Better, Democracy Stronger and Citizens More Powerful* (Brookings 2009) and co-editor of *The State of Play: Law, Games and Virtual Worlds* (NYU Press, 2005).

Professor Rod Glover is Interim Director of the Monash Sustainable Development Institute (MSDI). Rod specialises in large-scale innovation, at the levels of systems and societies. He works across policy, practice and research to support the design of innovation institutions and the development of innovation ecosystems.

He is a Director of Save the Children Australia, the Centre for Evidence and Implementation, and the independent think tank Per Capita. He has also been a Director of the Victorian Government's Centre of Excellence in Intervention and Prevention Science and the Australian Government's National Sustainability Council. As Chair, he oversaw the growth of Hands on Learning Australia into a world-leading educational intervention.

Among his public policy roles, Rod has been Deputy Secretary (Innovation and Projects) in Victoria's Department of Premier and Cabinet, and Senior Adviser to an Australian Prime Minister. He has led the design of major policy frameworks, including the COAG National Reform Agenda, and a National Industry and Innovation Statement.

ANNEX I

SURVEY ON INNOVATION SKILLS METHODOLOGY, RESULTS & SURVEY INSTRUMENT

The Governance Lab and Monash Sustainable Development Institute on behalf of ANZSOG conducted a survey to assess which approaches and tools Australian and New Zealand public servants use for problem solving in their work. Respondents report on their ability to explain a skill to others, the ability to apply the skill, interest in learning, training received on the skill and learning preferences. In addition, they were asked about their perception of the innovation environment in their organisation and innovation activity.

The survey was distributed through ANZSOG network of leaders of state and federal agencies in Australia and New Zealand who, in turn, circulated the survey within their organisations. The survey was also distributed via social media. Between June 12 to July 12 2019, 381 responses were returned

In order to keep the survey brief, the online questionnaire randomly presented each respondent with questions about 6 of the 9 innovative public entrepreneurial skills: 1) Problem Definition, 2) Human Centred Design (HCD), 3) Data Analytical, 4) Open Innovation, 5) Behavioural Insights, 6) Lean Agile, 7) Impact Evaluation, 8) Evidence Synthesis and 9) Systems Thinking. For each skill we provided a) a definition of the skill, b) an explanation of why it is important and c) an example to first, ensure a common understanding on the definition of the skill (as different terminology could be used to name it) and second, to be able to assess the interest in learning and its relevance in case respondents didn't know about the skill (see survey instrument in Annex II).

SECTION I. RESPONDENT'S CHARACTERISTICS

The target population of this survey were public servants of any level working for a state or federal agency. More than half of the respondents work in an Australian federal agency (55 per cent), followed by people working for Queensland and Victoria state governments (20 per cent). Public servants from New Zealand represent 10 per cent of our sample. Only 3 per cent of responses are from South Australia, Tasmania and Northern Territory.

Half of the respondents work on policy design, human resources and project/programme management (see Table 1.2). The rest are scattered across functions such as research (7 per cent), information and knowledge management (4 per cent), monitoring and auditing (3 per cent).

TABLE 1.1 FREQUENCY BY ORGANISATION'S JURISDICTION.

Organisation's Jurisdiction	Freq.	Per cent	Cum.
Federal	209	55	55
Queensland	46	12.11	67.11
New Zealand	36	9.47	76.58
Victoria	33	8.68	85.26
New South Wales	20	5.26	90.53
Western Australia	15	3.95	94.47
ACT	10	2.63	97.11
South Australia	5	1.32	98.42
Tasmania	4	1.05	99.47
Northern Territory	2	0.53	100
Total	**380**	**100**	

TABLE 1.2 FREQUENCY BY TYPE OF ACTIVITY.

Activity	Freq.	Per cent	Cum.
Strategic policy	81	21.54	21.54
Human resources	61	16.22	37.77
Project and programme	50	13.3	51.06
Managerial/Leadership	32	8.51	59.57
Research	25	6.65	66.22
Service delivery	24	6.38	72.61
Compliance and regulation	22	5.85	78.46
Administration	13	3.46	81.91
Information and knowledge management	13	3.46	85.37
Digital	12	3.19	88.56
Communications and marketing	11	2.93	91.49
Monitoring and audit	11	2.93	94.41
Legal and parliamentary	7	1.86	96.28
Engineering and technical	6	1.6	97.87
Info & comms tech	5	1.33	99.2
Accounting and finance	3	0.8	100
Total	**376**	**100**	

Almost 60 per cent of respondents work on general government services (e.g. Australian Taxation Office, Department of Premier & Cabinet, etc.) or economic affairs (Industry & planning, employment & skills, agriculture, etc.). 19 per cent work on health, social protection or education (see Table 1.3).

We asked respondents to indicate their current job level according to each jurisdiction's classification. We standardised responses in one scale based on the salary ranges.

47 per cent of the respondents are senior managers (APS EL1-EL2 or equivalent), 32 per cent mid-level managers (APS 5-6 or equivalent) and 13 per cent entry and junior level staff (APS 1-4 or equivalent). 7 per cent of our sample are senior executives (SES or equivalent). See Table 1.4.

Table 1.5 shows that 24 per cent of respondents are between 30 to 39 years old, those who are between 40–49 represent 30 per cent of our sample, and 50 to 59 years, 24 per cent.

TABLE 1.3 FREQUENCY BY SECTOR.

Sector	Freq.	Per cent	Cum.
General public services	126	34.71	34.71
Economic affairs	81	22.31	57.02
Health	25	6.89	63.91
Social protection	23	6.34	70.25
Education	22	6.06	76.31
Environmental protection	18	4.96	81.27
Housing and community amenities	10	2.75	84.02
Recreation, culture and religion	9	2.48	86.50
Public order and safety	3	0.83	87.33
Defence	2	0.55	87.88
Other	44	12.12	100
Total	**363**	**100**	

TABLE 1.4 FREQUENCY BY CLASSIFICATION LEVEL.

Classification	Freq.	Per cent	Cum.
Junior	51	13.39	13.39
Mid	121	31.76	45.14
Senior	182	47.77	92.91
Executive	27	7.09	100
Total	**381**	**100**	

TABLE 1.5 FREQUENCY BY AGE.

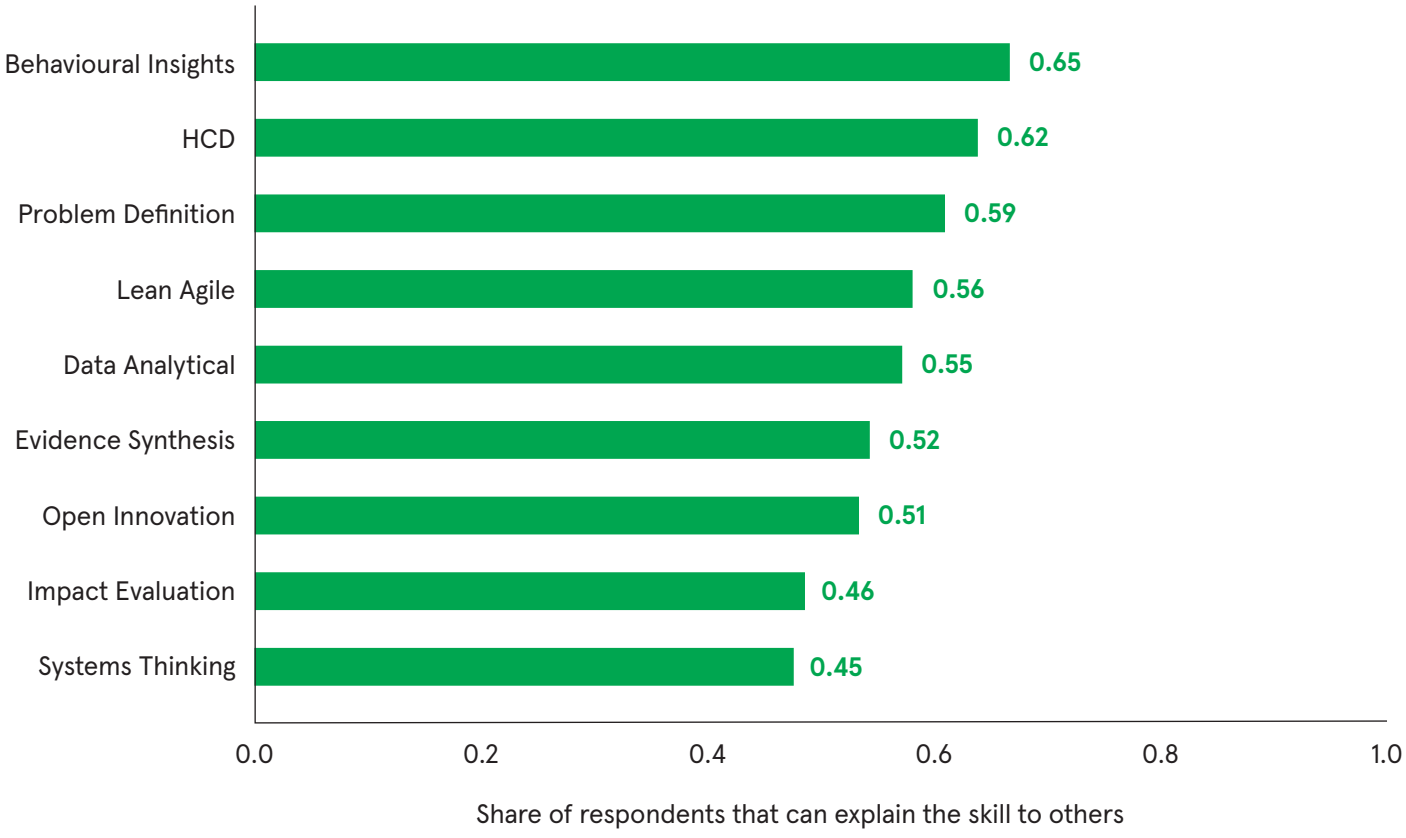
Age	Freq.	Per cent	Cum.
Under 20	1	0.27	0.27
20–29	51	13.56	13.83
30–39	91	24.20	38.03
40–49	112	29.79	67.82
50–59	90	23.94	91.76
60 years or older	31	8.24	100

SECTION II. AWARENESS OF SKILL & TRAINING

We assessed the level of awareness of skills by asking respondents on their ability to explain the skill to others ("I could explain the skill of {XX }to others").

On average, respondents are aware of 3 out of 6 skills. The skills respondents are more familiar with are Behavioural Insights, Human Centred Design and Problem Definition. Those skills that are the least familiar are Systems Thinking (45 per cent), Impact Evaluation (46 per cent) and Open Innovation (51 per cent) (see Figure 2.1).

FIGURE 2.1 SHARE OF RESPONDENTS THAT CAN EXPLAIN THE SKILL TO OTHERS, BY SKILL.



If respondents indicated that they could explain the skill to others, we asked if they have received formal training on the skill and where did they get the training. 60 per cent of respondents indicated that they have received formal training in at least one skill, and on average respondents have been trained in one of the six skills. The skills that have a largest share of respondents formally trained (see Figure 2.2) are Problem Definition (31 per cent), Evidence Synthesis (29 per cent), and Data Analytical (25 per cent). While people are less trained in Impact Evaluation (20 per cent), Human Centred Design (20 per cent), Systems Thinking (19 per cent) and Open innovation (8 per cent).

Of the skills that have been formally learned, 44 per cent of the times they have been learned at an education institution (see Table 2.3), 27 per cent at work and 29 per cent of the times through other channels (e.g. executive training).

The skills that have the largest share of respondents formally trained (Data analytical, Problem Definition and Evidence Synthesis) have been mainly learned at an education institution as part of a degree (see Figure 2.4). Lean Agile and Behavioural Insights have mainly been learned at work while other types of training (e.g. non-academic specialised programs) play an important role in providing training for Human Centred Design, Impact Evaluation and Open Innovation.

FIGURE 2.2 SHARE OF RESPONDENTS THAT HAVE RECEIVED FORMAL TRAINING PER SKILL.

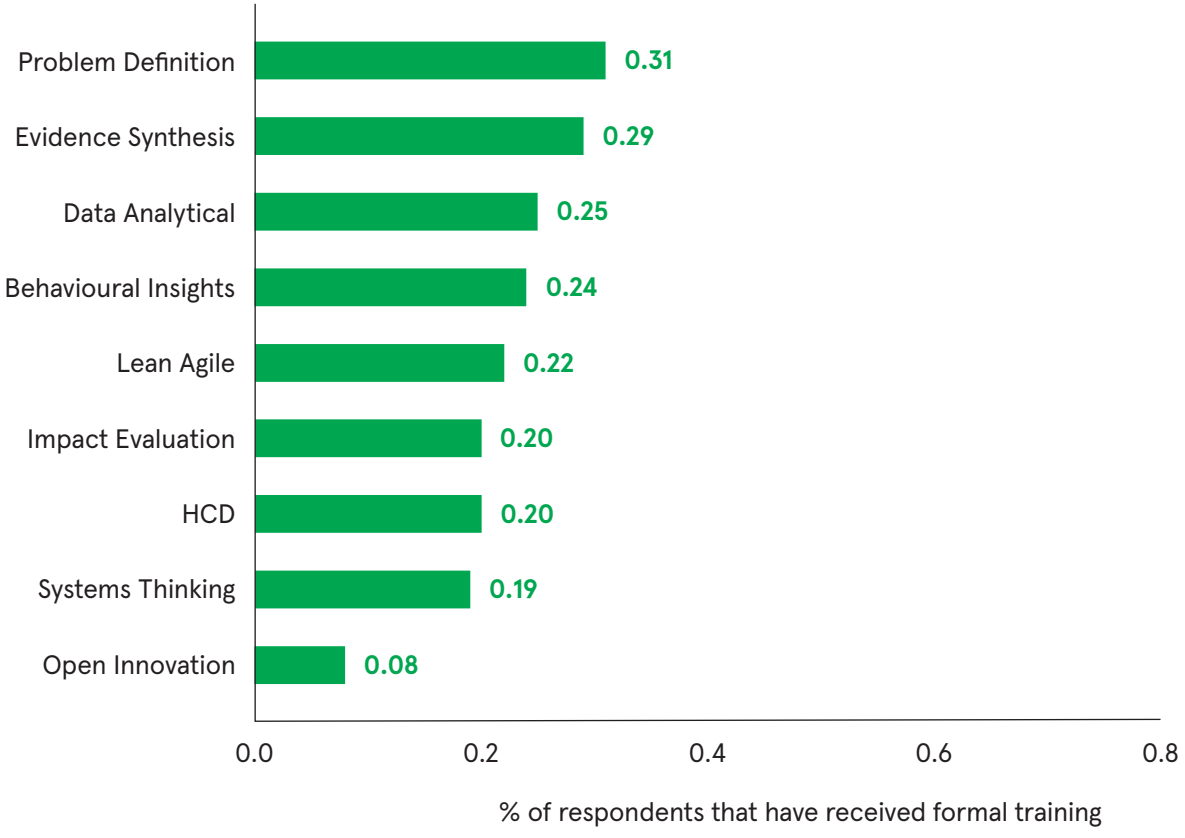
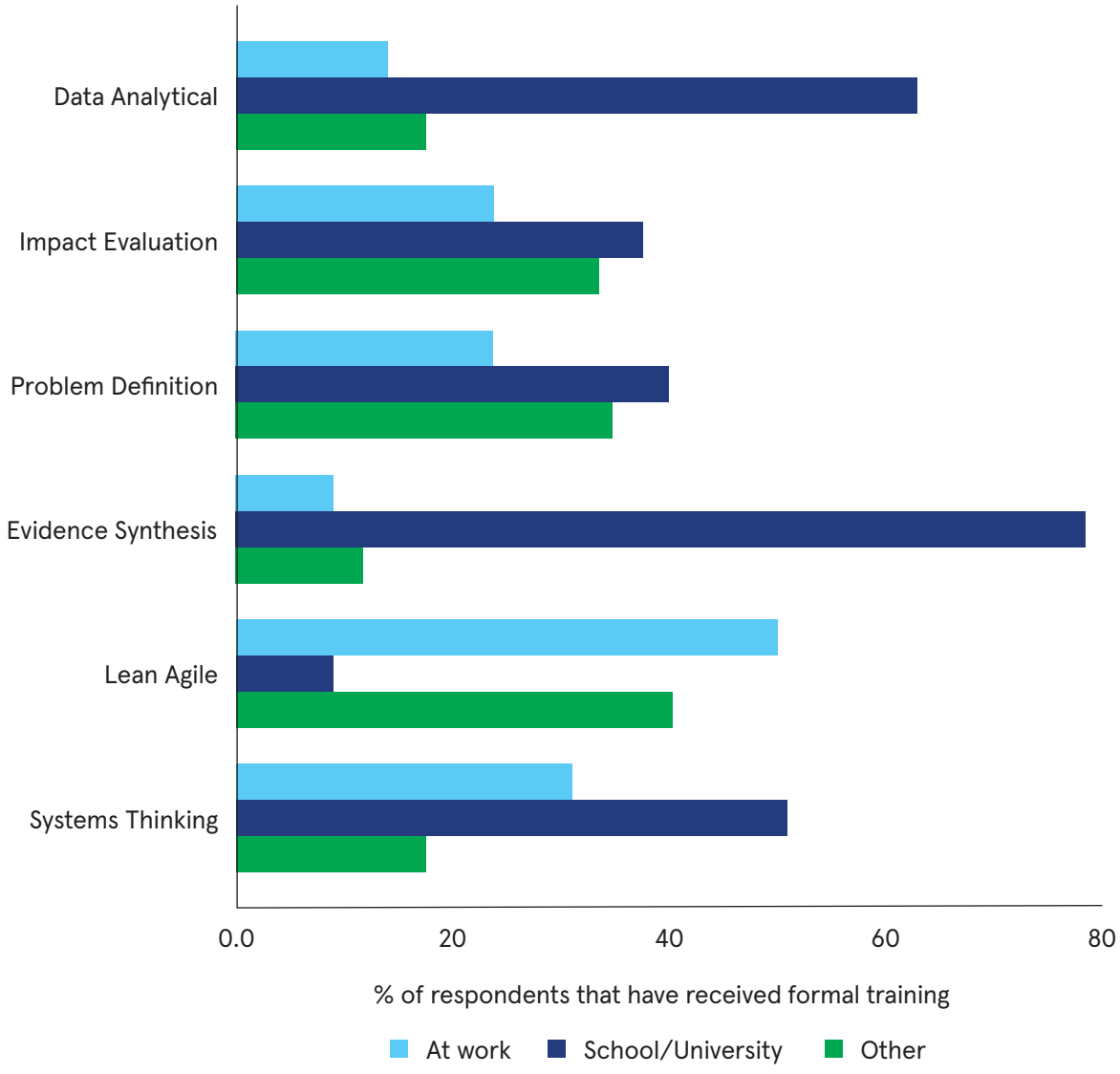


TABLE 2.3 FREQUENCY OF SKILLS BY TYPE OF TRAINING.

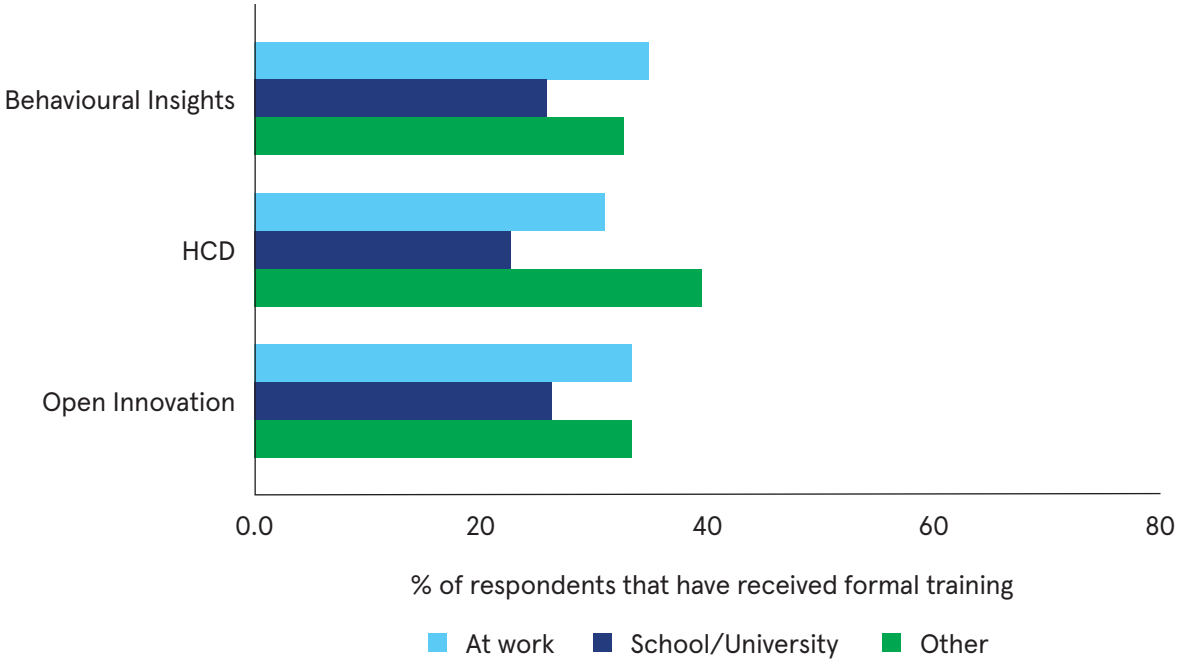
Training	Freq.	Per cent	Cum.
At work	128	26.56	26.56
School/University	214	44.40	70.95
Other	140	29.05	100
Total	**482**	**100**	

FIGURE 2.4 SHARE OF RESPONDENTS THAT HAVE RECEIVED FORMAL TRAINING BY SKILL AND TYPE OF TRAINING

Panel A



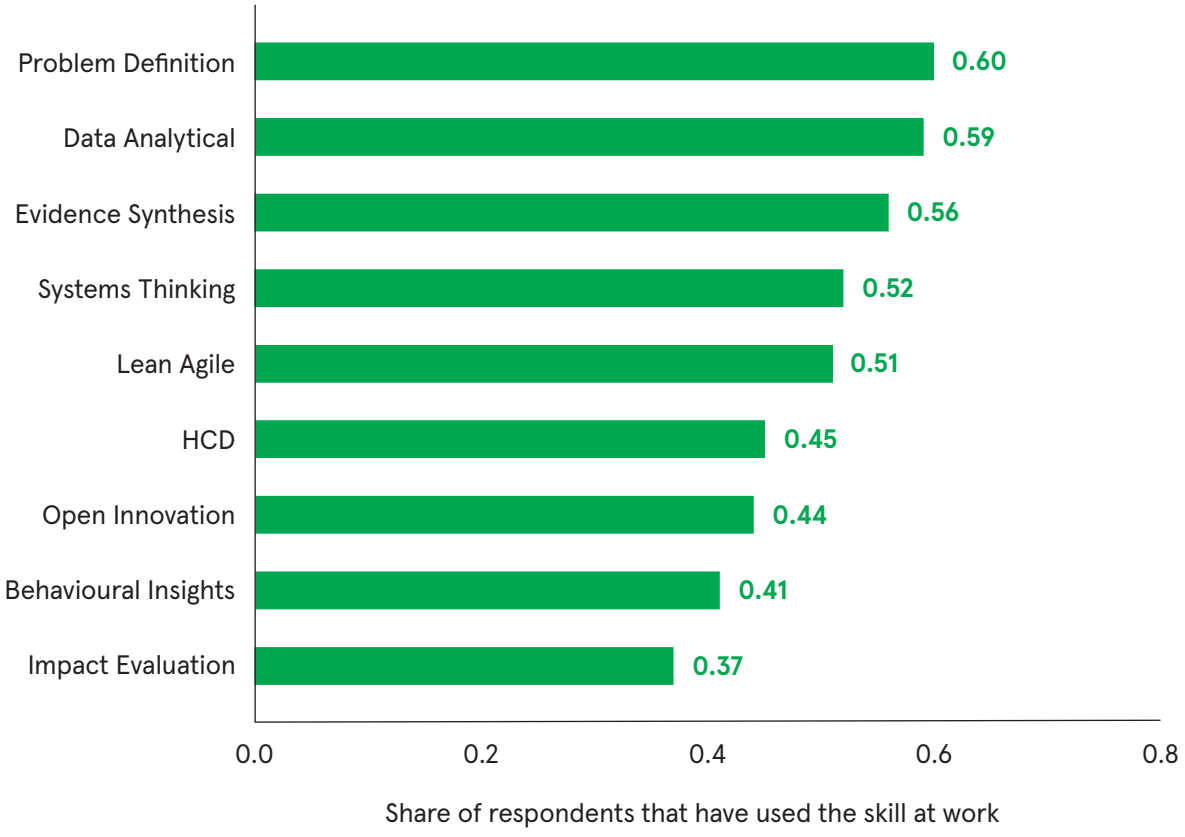
Panel B


Behavioural Insights
HCD
Open Innovation
0.0
20
40
60
80
% of respondents that have received formal training
At work
School/University
Other

SECTION III. USE OF SKILL

We asked respondents if they or their team have used the skill at work: "I (or my team) have used the skill of {XX} in our work previously." On average, respondents — or their team — have used 3 out of the 6 skills at work. The skills that more people use are Problem definition (62 per cent), Data Analytical Thinking (59 per cent) and Evidence Synthesis (56 per cent) while Impact Evaluation (37 per cent), Behavioural Insights (41 per cent) and Open Innovation (44 per cent) are the less common in practice.

FIGURE 3.1 SHARE OF RESPONDENTS THAT HAVE USED THE SKILL IN THEIR WORK ("I (OR MY TEAM) HAVE USED THE SKILL IN OUR WORK PREVIOUSLY").



Those that practiced the skill in the last year were presented with a set of subskills for them to indicate which of these they have used. Assessing the number of subskills used can provide an overview of the depth in which systematically these skills are being applied. The subskills listed are examples of the steps that someone applying the method would undertake (see list in table 3.2).

Table 3.2 shows the proportion of respondents that use each of the subskills. We can identify practice gaps in testing and evaluating to learn what works, for example: testing a minimum viable product in lean agile, designing and trial behavioural interventions, designing and implementing experimental or non-experimental evaluations have a lower share of respondents practicing the subskill compared to other subskills. In addition, we can identify a gap in a key analytical step for problem solving: the development of the hypothesis to be tested. Example of this can be observed in problem definition where only 63 per cent said they have developed a hypothesis when using the skill, 60 per cent in data analytical and only 46 per cent define a theory of change when using impact evaluation. We can also observe that less people practice more technical steps within a methodology such as drafting of journey maps (58 per cent), develop an agile project management plan (44 per cent) or use dynamic modelling (16 per cent).

TABLE 3.2 SHARE OF RESPONDENTS THAT USE EACH SUBSKILL.

Problem Definition	**Per.**	**N**
1. Develop a hypothesis	0.63	147
2. Define root causes	0.73	147
3. Describe the problem specifically	0.91	147
4. Reframe the problem	0.86	147
5. Describe a problem my organisation can impact	0.68	147
6. Engage others in defining the problem	0.84	147
Human Centred Design	**Per.**	**N**
1. Select target group to engage	0.89	100
2. Interview target group about needs	0.91	100
3. Observe target group to understand context	0.64	100
4. Sketch and mock up drafts of ideas, policies, services	0.77	100
5. Test concepts with target group for feedback	0.79	100
6. Draft journey maps	0.58	100

Data Analytical	Per.	N
1. Formulate a hypothesis	0.60	139
2. Identify data to test a hypothesis	0.68	139
3. Make sure that data is timely, accurate and clean	0.81	139
4. Spot patterns from data	0.90	139
5. Predict trends from data	0.71	139
6. Store data securely	0.56	139
7. Share data responsibly	0.64	139
8. Communicate what data says	0.93	139

Open Innovation	Per.	N
1. Define a clear and compelling goal	0.80	98
2. Identify participants	0.86	98
3. Determine appropriate incentives	0.46	98
4. Define the task for people to do	0.74	98
5. Decide on assessment criteria	0.63	98
6. Decide on how to use participants' contributions	0.83	98

Behavioural Insights	Per.	N
1. Identify problem, stakeholders and behaviours	0.88	99
2. Engage and consult stakeholders	0.90	99
3. Identify priority behaviours	0.68	99
4. Collect evidence of behavioural interventions	0.51	99
5. Design policy intervention	0.47	99
6. Trial behavioural interventions	0.39	99
7. Adapt and scale-up interventions	0.34	99

Lean Agile	Per.	N
1. Define an overall vision	0.70	115
2. Define an MVP	0.61	115
3. Collaborate across team	0.89	115
4. Determine how to test results of the MVP	0.44	115
5. Decide what to do next based on results	0.64	115
6. Develop an agile project management plan	0.44	115

Impact Evaluation	Per.	N
1. Define theory of change	0.46	79
2. Define outcome indicators	0.89	79
3. Identify a testable question	0.63	79
4. Design an experiment within a program/project	0.57	79
5. Use randomisation	0.34	79
6. Use non-experimental methods	0.24	79
7. Analyse the results	0.76	79
Make strategic decisions based on the learnings	0.77	79

Evidence Synthesis	Per.	N
1. Frame research question	0.81	127
2. Define search criteria	0.70	127
3. Search and selection studies	0.84	127
4. Assess the quality of studies	0.64	127
5. Summarise findings	0.91	127
6. Determine applicability of findings	0.78	127
7. Make strategic decisions based on learnings	0.82	127

Systems thinking	Per.	N
1. Systems mapping	0.89	111
2. Causal loop modelling	0.17	111
3. Dynamic modelling	0.16	111
4. Scenario planning and modelling	0.69	111
5. Strategy development and testing	0.69	111

SECTION IV. INTEREST IN LEARNING SKILLS AND LEARNING PREFERENCES

For each skill, we asked respondents about their interest in learning more. The proportion of people that can't explain the skill and expressed an interest in learning one of the six skills they were asked about, ranges from 50 per cent to 83 per cent. The skills with higher demand are Impact Evaluation (83 per cent), Systems Thinking (76 per cent) and Open Innovation (73 per cent). The skills with lower demand are Problem Definition, Data Analytical and Human Centred Design (see Figure 4.1).

The interest in learning is lower for those that already can explain the skill (16 per cent to 35 per cent) and the skills in demand differ from those that don't know the skill (see Figure 4.2). More people are interested in learning more about Human Centred Design (35 per cent), Open Innovation (34 per cent) and Behavioural Insights (29 per cent); and less interested in Evidence Synthesis (18 per cent), Impact Evaluation (21 per cent) and Problem Definition (22 per cent).

FIGURE 4.1 SHARE OF RESPONDENTS THAT CAN'T EXPLAIN THE SKILL AND WANT TO KNOW MORE.

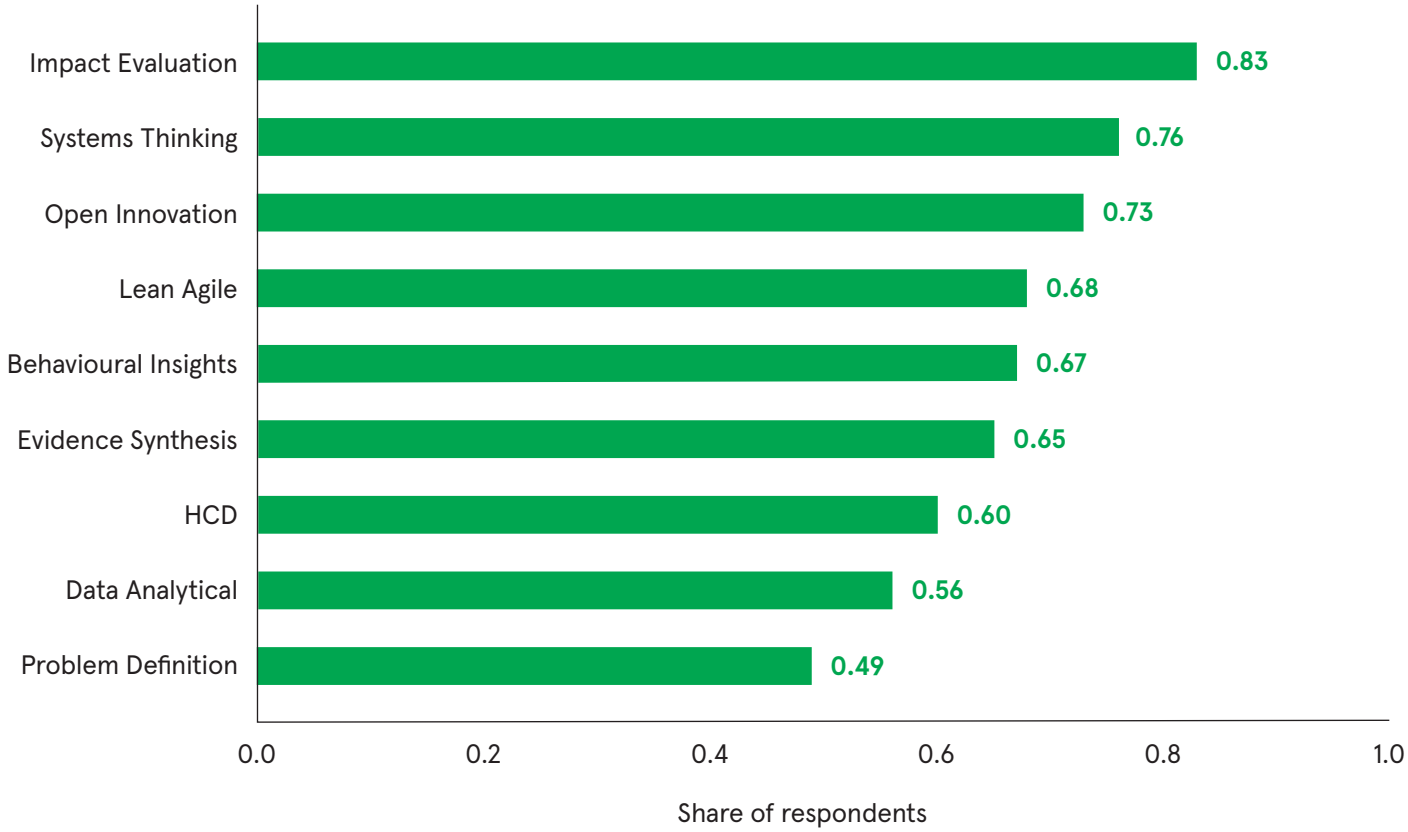
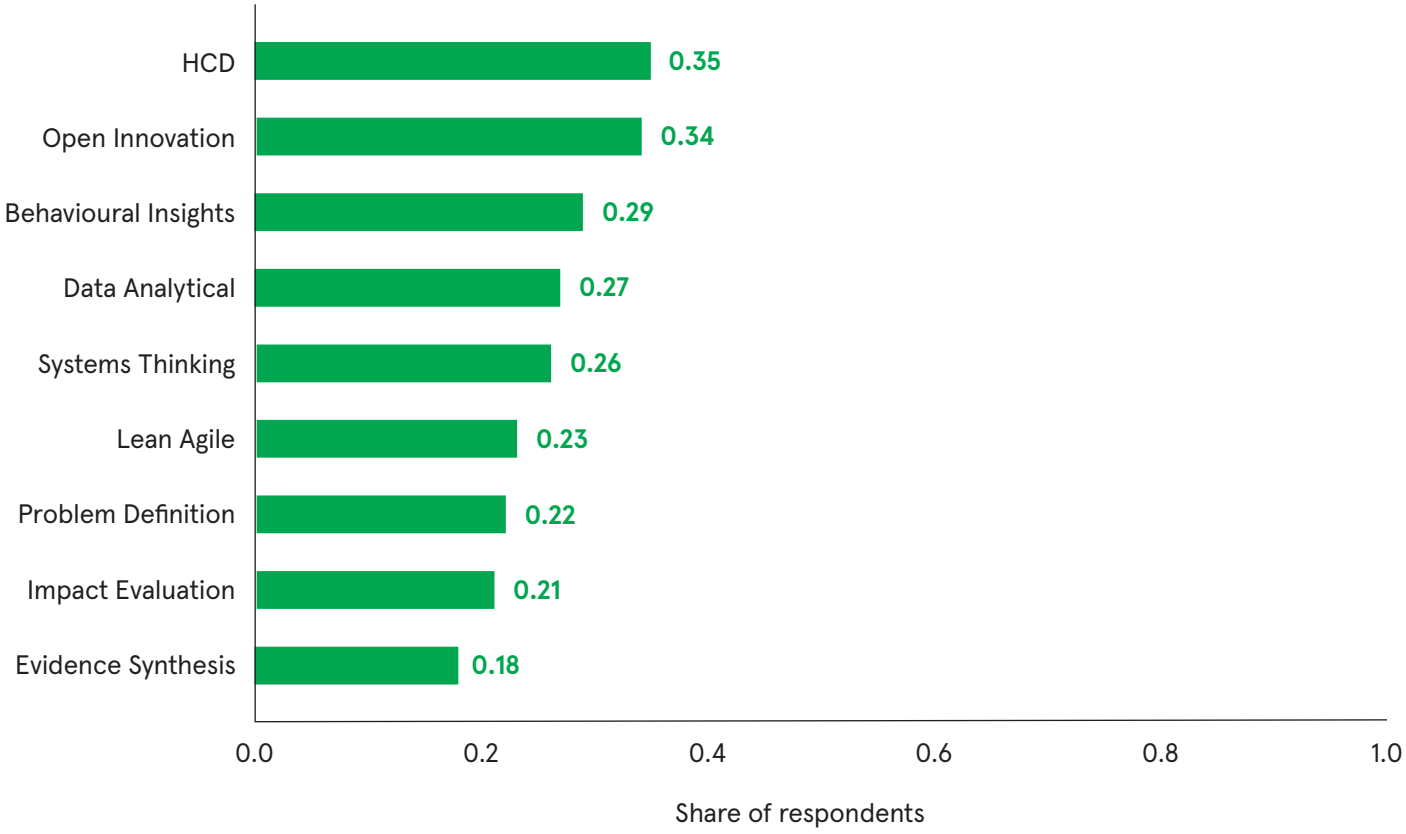
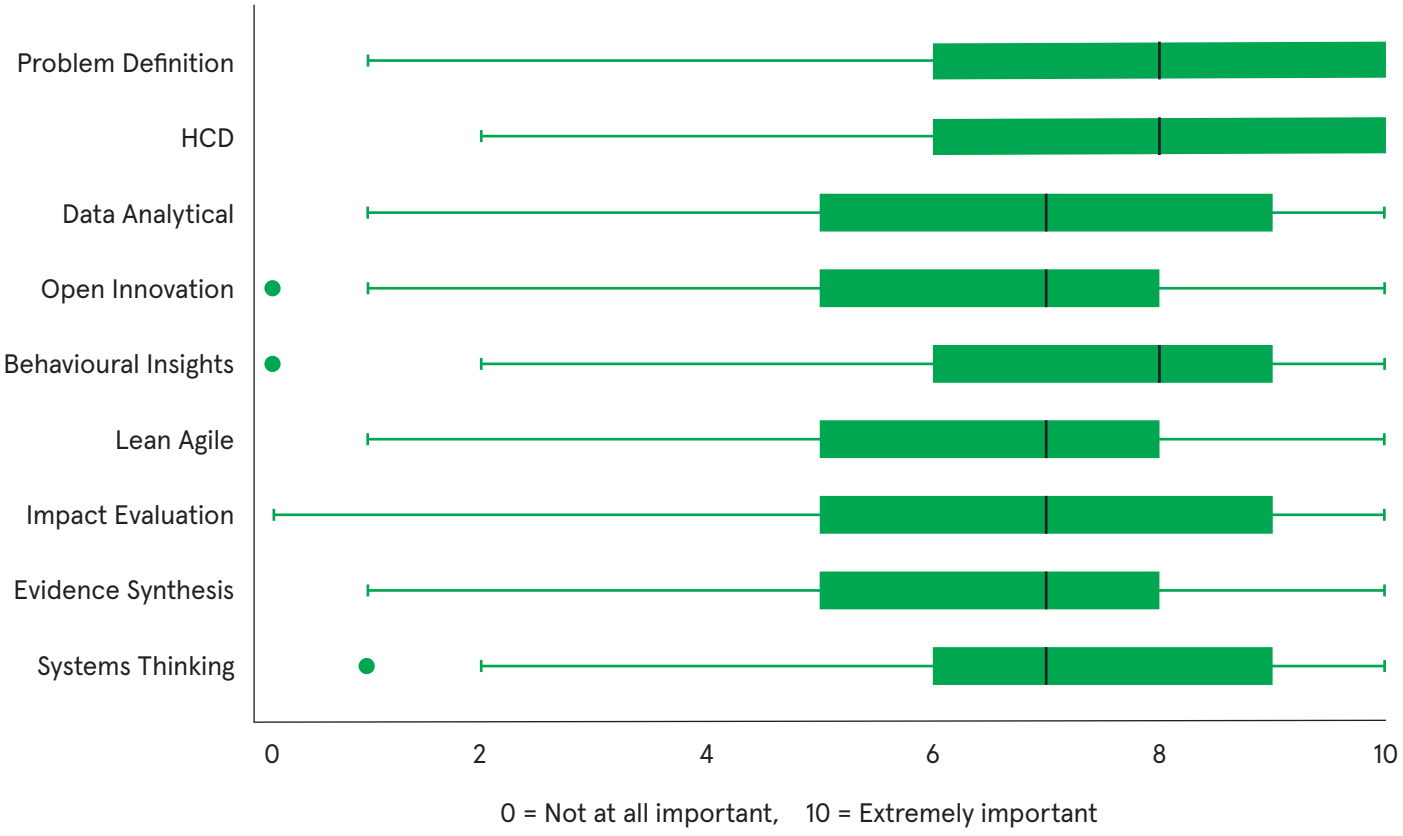


FIGURE 4.2 SHARE OF RESPONDENTS THAT CAN EXPLAIN THE SKILL AND WANT TO KNOW MORE.



For those that indicated that haven't received formal training in a skill, we asked how important was it for them professionally to learn the skill. Respondents were asked to indicate in a scale of 0 to 10, where 0 represented "Not at all important" and 10 "Extremely important". Overall, respondents consider learning these skills as "somewhat important" for their work. Six skills have a median relevance score of 7: Data Analytical, Open Innovation, Lean Agile, Impact Evaluation, Evidence Synthesis and Systems Thinking. Three skills have a median score of 8: Problem Definition, Human Centred Design and Behavioural Insights (See Figure 4.3).

FIGURE 4.3 AVERAGE RELEVANCE OF LEARNING THE SKILL.



SECTION V. ENABLING ENVIRONMENT

The second section of our survey aimed to capture respondent's perception on the enabling environment for new ways of working. Respondents had the option to submit their responses or continue the survey to answer questions regarding the organisational environment. From the 381 that answered the survey, 284 (75 per cent), responded the enabling environment section.

For non-executive level public servants (267), we asked to express their agreement or disagreement level with the 14 statements below in a 5-point agreement scale (strongly agree-strongly disagree):

1. Staff have incentives to think of new ideas and take part in their development.
2. Managers give high priority to developing new ideas or new ways of working.
3. Senior management is willing to take risks to support new ideas.
4. My organisation provides funding to develop and test new ideas.
5. My organisation provides training to develop and test new ideas.
6. We take an evidence-based approach to most things in my organisation.
7. My organisation regularly evaluates its programs and activities.
8. My organisation values proven results.
9. We don't do much to track our organisation's outcomes.
10. Users/clients are systematically involved in the design or planning of new or improved services, products and/or policies.
11. We (branch) use technology to collect and analyse data for decision making.
12. We (branch) share information, discuss problems and find solutions together with other branches within my organisation.
13. We (branch) share information, discuss problems and find solutions together with other public sector organisations.
14. We (branch) share information, discuss problems and find solutions together with other sectors such as NGO, academia/business.

On average, 50 per cent of respondents agree that managers prioritise on new ideas and 54 per cent agree that they have incentives to think of new ideas, although a lower share agrees that managers are willing to take risks to support these (40 per cent).

Resources available for innovation are limited, according to respondents. Only 34 per cent agrees that their organisation provides funding to develop and test new ideas and 38 per cent indicated that it provides training (see Figure 5.1-Panel A).

More than 60 per cent agree that their organisation takes an evidence-based approach and 76 per cent considers that their organisation values results. 25 per cent agrees that the organisation don't do much to track outcomes and 50 per cent agrees that the organisation regularly evaluates its programs and activities. At the branch level, 68 per cent agreed that they use technology to collect and analyse data for decision making (see Panel B).

Panel C shows that collaboration in the agency decreases with distance: collaboration within the organisation is relatively higher (64 per cent) than collaboration with other government agencies (49 per cent) and with other sectors (31 per cent). 50 per cent agreed that their branch use participatory approaches to design an introduce innovations (see Panel C).

FIGURE 5.1 SHARE OF PARTICIPANTS BY LEVEL OF AGREEMENT

Using factor analysis, we examined the correlations among the 14 environmental statements. Table 5.2 shows that each of the factors have high weights for a subset of the variables. The first factor heavily weights variables related to openness and resources (we call this innovation strategy), the second weights variables related to use of evidence and data (evidence-based approach), and the third weights variables related to collaboration (collaboration). We use these three clusters in subsequent analysis to assess relationships between environment and use of skills (see Section VI).

TABLE 5.2 ROTATED FACTOR LOADINGS.

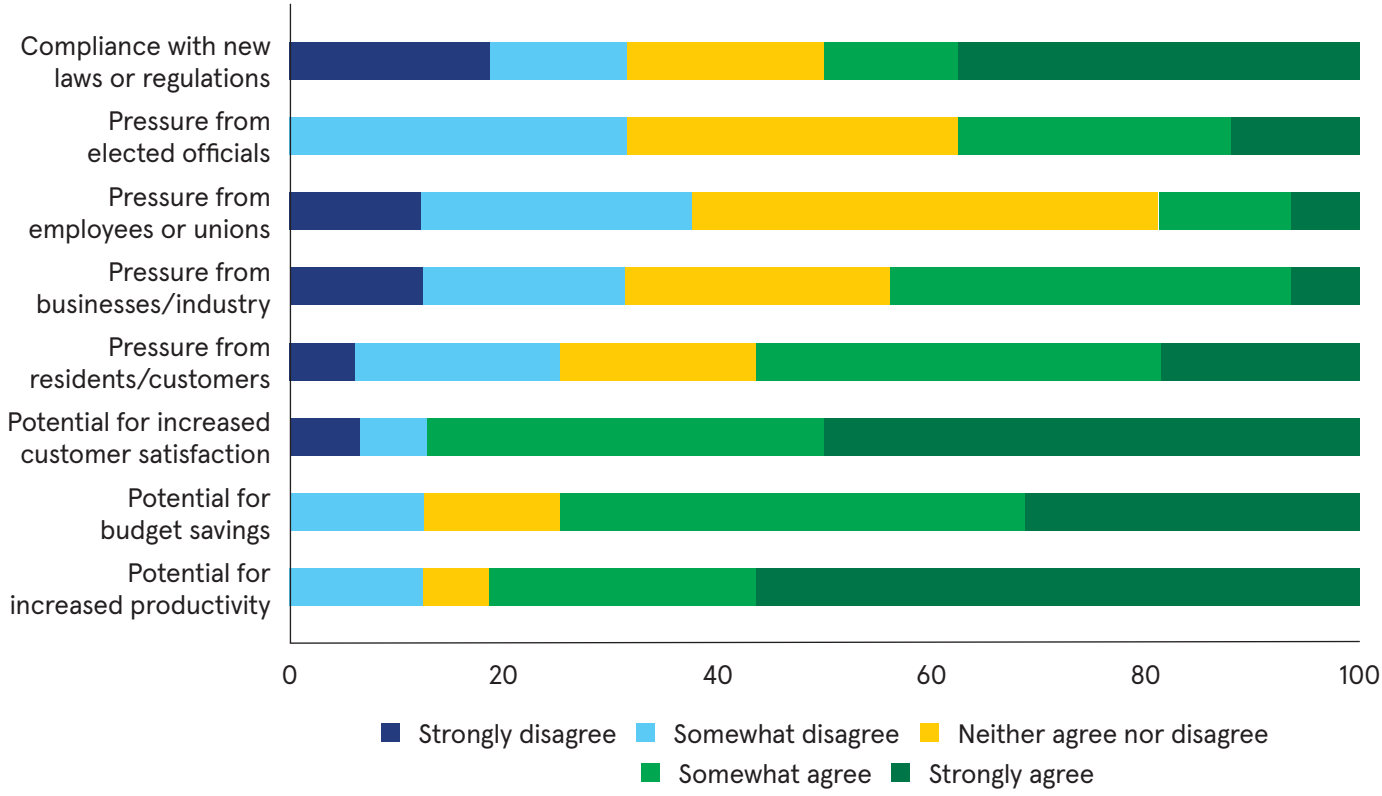
	Factor 1 (Strategy)	Factor 2 (Evidence)	Factor 3 (collaboration)
Incentives new ideas	0.79	0.22	0.14
Funding for development	0.75	0.26	0.11
Training for innovation	0.73	0.21	0.16
Mgr prior new ideas	0.72	0.19	0.17
Mgr take risk	0.71	0.09	0.30
Org evaluates programs	0.18	0.80	0.26
Org evidence based	0.31	0.76	0.17
Org values results	0.23	0.72	0.21
Org don't track out	-0.13	-0.60	-0.22
Br. technology/data	0.14	0.57	0.46
Br. collab other gov	0.19	0.19	0.83
Br. collab other sectors	0.11	0.18	0.81
Br. collab internally	0.18	0.32	0.77
Br. part approaches	0.33	0.12	0.53

For executive level respondents (17), we asked about their level of agreement on potential hindrances and drivers of innovation in their organisation. We considered the following drivers:

1. Potential for increased productivity.
2. Potential for budget savings.
3. Potential for increased customer satisfaction.
4. Pressure from residents/customers.
5. Pressure from businesses/industry.
6. Pressure from employees or unions.
7. Pressure from elected officials.
8. Compliance with new laws or regulations.

Figure 5.3 shows the level of agreement with each statement in a 5-point scale of importance. At least 80 per cent agreed that potential to increase productivity, budget savings and customer satisfaction are drivers for productivity.

FIGURE 5.3 DRIVERS FOR INNOVATION, SHARE OF RESPONDENTS.

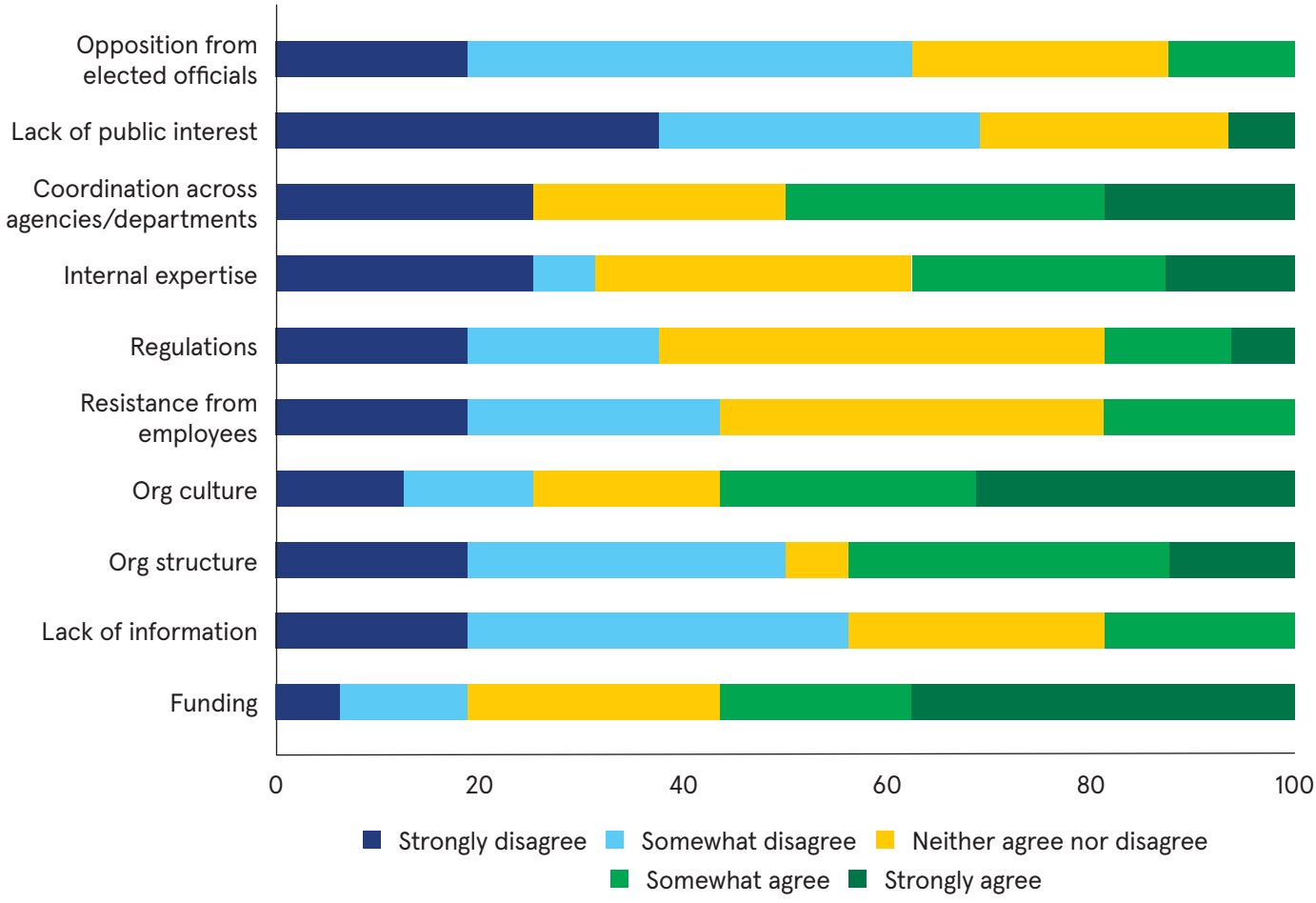


We also asked about the main hindrances:

1. Availability of funding.
2. Lack of information on how to proceed.
3. Current organisational structure.
4. Current organisational culture.
5. Resistance from employees or unions.
6. State or federal policies or regulations.
7. Lack of internal expertise.
8. Challenges coordinating across agencies/ departments.
9. Lack of public interest.
10. Opposition from elected officials.

Lack of funding and organisational culture are the issues most respondents agreed with (56 per cent and 55 per cent respectively) followed by organisational structure and coordination challenges (44 per cent and 49 per cent).

FIGURE 5.4 HINDRANCES FOR INNOVATION, SHARE OF RESPONDENTS.



SECTION VI. RELATIONSHIP BETWEEN SKILL PRACTICE, TRAINING AND ENVIRONMENT

We explored what factors are correlated with the practice of the skills. We first assessed the relationship between awareness and practice. We ran a logistic regression with practice of skill as the dependent variable and skill awareness as the independent variable. Both take a value of 0 if the skill is not practiced/known, and 1 if the skill is practiced/known. The level of observation is the knowledge and practice of each skill at the individual level. Column 1 of Table 6.1 shows that, on average, there is a statistically significant and positive relationship between awareness and practice. Column 2 & 3 shows that the relationship continues to be significant even when controlling for the type of skill and individual effects. Being aware of the skill increases the odds ratio of practicing the skill by 52 per cent.

TABLE 6.1 RELATIONSHIP BETWEEN SKILL PRACTICE & SKILL AWARENESS.

Variables	(1) Odd ratio Skill practice	(2) Odd ratio Skill practice	(3) Odd ratio Skill practice
Skill awareness	1.724*** (0.153)	1.759*** (0.160)	1.520*** (0.245)
Constant	0.733*** (0.048)	1.091 (0.154)	3.323 (3.014)
Observations	2098	2098	1642
Skill fixed effect	NO	YES	YES
Ind fixed effect	NO	NO	YES

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
NOTE: Level of observation: skill practice at the individual level.

Even though there is a positive relationship between awareness and practice, some of the skills present large disparities between awareness and practice. The skills that present the largest gaps are Behavioural Insights, Human Centred Design, Open Innovation and Impact Evaluation.

Interviews with innovation leaders suggest that hands on training plays a key role in putting these skills into practice. We assessed this relationship controlling for skill effects and found a positive and significant relationship between training and practice (see Table 6.2). Column 2 indicates, that on average, people with training have almost three times higher odds (180 per cent higher) of practicing the skill compared to the odds of practicing the skill without training.

TABLE 6.2 RELATIONSHIP BETWEEN TRAINING AND PRACTICE OF THE SKILL.

Variables	(1) Odd ratio Skill practice	(2) Odd ratio Skill practice	(3) Odd ratio Skill practice
Skill training	2.862*** (0.315)	2.800*** (0.315)	4.089*** (0.761)
Constant	0.763*** (0.039)	1.116 (0.154)	2.997 (2.615)
Observations	2077	2077	1632
Skill fixed effect	NO	YES	YES
Ind fixed effect	NO	NO	YES

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
NOTE: Level of observation: skill practice at the individual level.

The exercise of innovation skills not only depend on the capability of the individuals, but also on the environment in which they work. We tested this hypothesis using a logistic regression to assess the relationship between the practice gap and the environment. An individual has a practice gap — value 1 — in a skill if the person is aware of the skill but doesn't practice it and 0 if the person is aware and practice the skill. We used the factor scores of the three environmental clusters identified in section V to assess the relationship between the practice gap and the environment and included skill fixed effects. The statistically significant coefficients, smaller than 1, indicate that on average there is a negative correlation between the gap and the perception of the strategy/openness of the organisation (columns 2 – 5 of Table 6.3). We found also a statistically significant negative relationship between the perception of the collaborative environment and the practice gap (columns 3 – 5). This supports the hypothesis that a more conducive environment — in this case estimated by the perception of respondents — reduces the practice gap of skills. The evidence-based cluster is not statistically significant (see columns 4 and 5 of Table 6.3).

We obtained similar results, when testing the relationship between environment and practice of the skill. In this case we can observe a positive relationship between practice and the perception on innovation strategy and collaboration. Table 6.4 shows coefficients larger than 1 and statistically significant for skill training, strategy and collaboration.

TABLE 6.3 RELATIONSHIP BETWEEN PRACTICE GAP AND ENVIRONMENT PERCEPTION.

Variables	(1) Odd ratio Gap	(2) Odd ratio Gap	(3) Odd ratio Gap	(4) Odd ratio Gap	(5) Odd ratio Gap
Skill training	0.572***	0.566***	0.566***	0.567***	0.585***
	(0.073)	(0.093)	(0.093)	(0.094)	(0.101)
Strategy		0.848**	0.849**	0.849**	0.846**
		(0.064)	(0.066)	(0.066)	(0.068)
Collaboration			0.663***	0.663***	0.658***
			(0.055)	(0.055)	(0.056)
Evidence				1.021	0.998
				(0.077)	(0.077)
Constant	0.973	0.890	0.902	0.091	0.562**
	(0.071)	(0.084)	(0.088)	(0.088)	(0.139
Observations	1141	708	708	708	708
Skill fixed effect	NO	NO	NO	NO	YES

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
NOTE: Level of observation: skill practice at the individual level.

TABLE 6.4 RELATIONSHIP BETWEEN PRACTICE OF SKILL, AND ENVIRONMENT PERCEPTION.

Variables	(1) Odd ratio skill practice	(2) Odd ratio skill practice	(3) Odd ratio skill practice	(4) Odd ratio skill practice	(5) Odd ratio skill practice
Skill training	2.862***	2.772***	2.734***	2.733***	2.734***
	(0.315)	(0.395)	(0.387)	(0.386)	(0.400)
Strategy		1.132**	1.139**	1.139**	1.144**
		(0.065)	(0.067)	(0.067)	(0.068)
Collaboration			1.329***	1.329***	1.335***
			(0.079)	(0.079)	(0.080)
Evidence				1.029	1.037
				(0.060)	(0.061)
Constant	0.763***	0.847***	0.849**	0.849**	1.596**
	(0.039)	(0.055)	(0.056)	(0.056)	(0.297)
Observations	2077	1272	1272	1272	1272
Skill fixed effect	NO	NO	NO	NO	YES

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
NOTE: Level of observation: skill practice at the individual level.

ANNEX II

AUSTRALIA AND NEW ZEALAND INNOVATION SKILLS SURVEY INSTRUMENT

Welcome to this Australia New Zealand School of Government (ANZSOG) Innovation Skills Survey developed by Monash Sustainable Development Institute (MSDI) and The NYU Governance Lab (GovLab) (IRB-FY2019-2893)

These questions for public servants in Australia and New Zealand are designed to help us understand your knowledge of new ways of working and solving problems, such as human-centred design and open innovation. To ensure that we share a common understanding of these skills, we offer a brief definition and an example of each skill in action before asking you about them.

Please note that you may be using these skills in your work but call them something different (i.e. open innovation is also known as ideation or brainstorming or crowdsourcing). We are interested in how you work regardless of the terminology.

Your voluntary answers to this brief questionnaire will enable us to design better training programs for you, your peers and the next generation of public leaders. This will only take 10 – 15 minutes to complete. You can suspend the survey and finish it another time by simply closing your browser. To complete the survey at a later stage, click on the original link to re-start where you left off.

We're going to start with a few short questions about who you are and your professional focus.

If you have any questions, please contact:
E: public-entrepreneur@thegovlab.org

About you and your work

Q1.1 Are you a state or federal public servant working in Australia or New Zealand?

- ○ Yes
- ○ No

Q1.2 Where do you work? (Organisation name)

_____

Q1.3 What is your organisation's jurisdiction?

- ○ Federal-Australia
- ○ ACT
- ○ New South Wales
- ○ Northern Territory
- ○ Queensland
- ○ South Australia
- ○ Tasmania
- ○ Victoria
- ○ Western Australia
- ○ New Zealand
- ○ None of the above

Q1.4 What is your work classification level?

_____

Q1.5 In your current role are you directly managing five or more people?

- ○ Yes
- ○ No

Q1.6 Which one of the following best describes the type of work you do (select one)?

- ○ Accounting and finance
- ○ Administration (e.g. administrative support)
- ○ Communications and marketing
- ○ Compliance and regulation
- ○ Digital (e.g. designer, developer, web operations, performance analyst, etc.)
- ○ Engineering and technical
- ○ Human resources
- ○ Information and communications technology
- ○ Information and knowledge management
- ○ Legal and parliamentary
- ○ Managerial/Leadership
- ○ Monitoring and audit
- ○ Project and programme (e.g. programme/ project management)
- ○ Research (e.g. economic/actuary/data analysis)
- ○ Service delivery (e.g. customer advice and support, program delivery)
- ○ Strategic policy (e.g. strategic policy, policy development, policy advice)

Q1.7 To help us better understand what you do, briefly tell us about a recent or upcoming professional project (e.g. developing an app to predict recidivism or reducing cost of procuring sanitation services) (Optional, no more than 25 words)

_____

Q1.8 What is your age?

- ○ Under 20 years
- ○ 20–29 years
- ○ 30–39 years
- ○ 40–49 years
- ○ 50–59 years
- ○ 60 years or older

End of Block: About You and Your Work

Start of Block: Intro Skills

Innovation skills

Next, we're going to randomly present you with 6 of 9 innovative "public entrepreneur" skills, enabled by new technology, that foster more informed ways of working. We want to know more about your current interest in and knowledge of these skills. In each of the following sections, we will: 1) define a skill and why it is important to make sure we share a common understanding, 2) provide an example, again, to make sure what we are asking about is clear, and 3) ask you to answer 3 questions about your use of that skill.

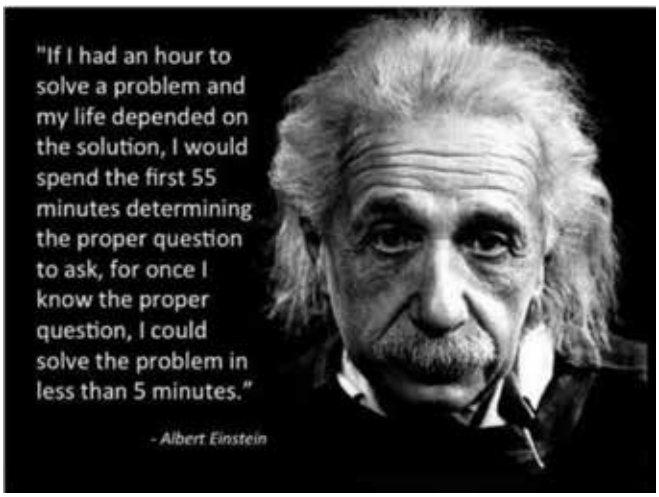
The 9 Public Entrepreneur Skills:

1. **Problem definition**
2. **Human-centred design**
3. **Data analytical thinking**
4. **Open innovation**
5. **Behavioural insights**
6. **Lean-agile methods**
7. **Impact evaluation methods**
8. **Evidence synthesis methods**
9. **Systems thinking**

Again, answer with regard to the substance of the question even if you know the skill by another name.

Start of Block: Skill 1

Q2.1 Problem definition



Source: IdeaChampions Retrieved from: http://www.ideachampions.com/weblogs/archives/quotes/index.shtml

What is it?

Problem definition is the process of narrowing an issue down to a more readily actionable smaller problem by hypothesising why a problem is occurring and identifying its root causes. The process involves a multi-step process of defining and re-framing the problem to arrive at either a narrower or a new understanding of an actionable challenge that you can tackle. Problem definition skills include developing a hypothesis, defining and re-defining root causes.

Q2.2 Why does it matter?

One cannot come up with workable solutions until one has defined, as concretely as possible, the problem to be solved. Show me an example:

Watch the video here.

In the 1978 *Art of Problem Solving*, Russell Ackoff illustrates the example of the "slow elevator problem." Hotel guests complain to the manager that the elevator is too slow. The Manager consults an engineer who defines the problem mechanically and proposes the obvious solution of replacing the elevator engine at great expense. But the manager digs deeper and hires a psychologist who reframes the problem as "the wait is annoying." Then it suddenly becomes obvious that hanging a mirror outside of the elevator for people to gaze in will reduce frustration more cheaply. By framing the problem differently, suddenly you discover a more actionable opportunity to solve it.

If you're interested in learning more about Problem Definition, here are a few suggestions for further reading and watching:

- HBR Article, Are You Defining the Right Problem?
- Alph Bingham, Problem Definition Video
- Defining a Problem, Crash Course Kids
- Positive Deviance Field Guide

Now, please answer the following questions...

Q2.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Problem Definition to others.
- ○ I (or my team) have used the skill of Problem Definition in our work previously.
- ○ I want to know more.
- ○ None of the above.

Q2.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

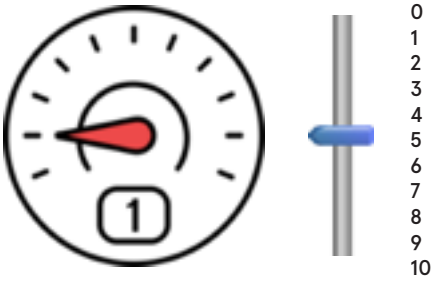
Q2.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q2.6 Where did you receive the training?

_____

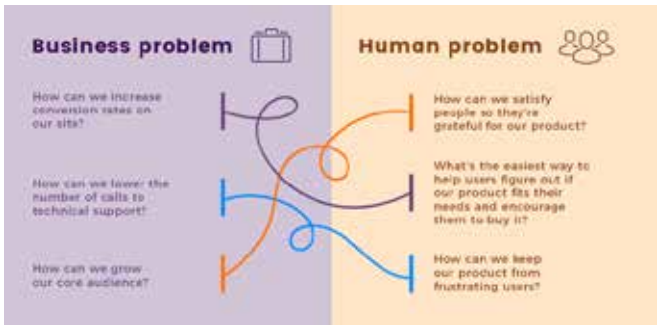
Q2.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q2.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills have you also used:

- ○ Develop a hypothesis
- ○ Define root causes
- ○ Describe the problem specifically
- ○ Reframe the problem
- ○ Describe a problem my organisation can impact
- ○ Engage others in defining the problem

Q3.1 Human-centred design



Source: RubyGarage. Retrieved from: https://rubygarage.org/blog/human-centered-design

What is it?

Human-centred design is an iterative process that starts with the people you're designing for and ends with new solutions that are tailor made to suit their needs (IDEO). It consists of ethnographic practices that involve observing or talking to those affected by a policy or service to understand their needs, desires and experiences. Human-centred design engages and involves users from start to finish — from the initial research into defining a problem, to creating solutions and then testing and implementing them (Bloomberg Cities). This qualitative research skill can involve such sub-skills as interviewing, prototyping and journey mapping.

Q3.2 Why does it matter?

Government solves problems faster and more effectively when it understands the environment, wants, and needs of those affected. Show me an example:

Watch the video here.

The San Francisco Unified School District used human-centred design to increase student participation in the free school lunch program. By interviewing students, staff, family and community members and running a workshop with students to design their own fruit stand, the District's Director of Innovation and Strategy used student input to reimagine and redesign the school dining experience in order to make it more equitable and enjoyable and increase participation among all students.

If you're interested in learning more about Human-Centred Design, here are some suggestions for further reading and watching:

- IDEO Human Centred Design Toolkit
- DIY Toolkit
- NESTA Designing Public Services
- Service Innovation Toolkit

Now, please answer the following questions...

Q3.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Human-Centred Design to others.
- ○ I (or my team) have used the skill of Human-Centred Design in our work previously.
- ○ I want to know more.
- ○ None of the above.

Q3.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

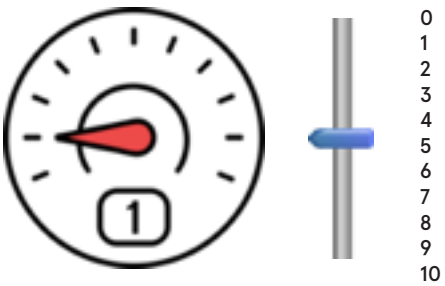
Q3.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q3.6 Where did you receive the training?

_____

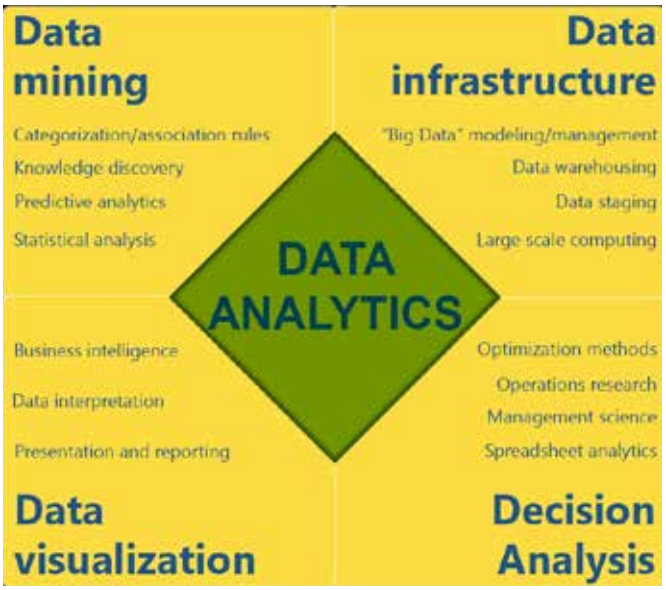
Q3.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q3.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Select target group to engage
- ○ Interview target group about needs
- ○ Observe target group to understand context
- ○ Sketch and mocking up drafts of ideas, policies and services
- ○ Test concepts with target group for feedback
- ○ Draft journey maps

Q4.1 Data analytical thinking



Source: Digital Vidhya. Retrieved from: https://www.digitalvidya.com/blog/data-analytics-skills/

What is it?

Data analytical thinking emphasises the value of data to achieve improved outcomes and equities, reduced cost and increased efficiency in how public policies and services are created. Data analytical skills include formulating a hypothesis, identifying data to test a hypothesis, spotting patterns and predicting trends from data and sharing data responsibly.

Q4.2 Why does it matter?

By making it possible to measure past successes, spot present disparities, and predict future performance, data is becoming a key tool for making decisions and tackling problems in every arena. Show me an example:

Watch the video here.

Lincoln, NE developed 132 performance indicators to measure the City's progress toward 39 goals in eight outcome areas. On its Taking Charge website, the city displays justification and support for each performance measure and describes the strategy to achieve each goal. (GovEx)

If you're interested in learning more outside of this survey, please see the following resources:

- The GovLab's Solving Public Problems with Data Online Course
- Open Data Institute Skills Framework
- Data Collaboratives Canvas

Now, please answer the following questions...

Q4.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Data Analytical Thinking to others.
- ○ I (or my team) have used the skill of Data Analytical Thinking in our work previously.
- ○ I want to know more.
- ○ None of the above.

Q4.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

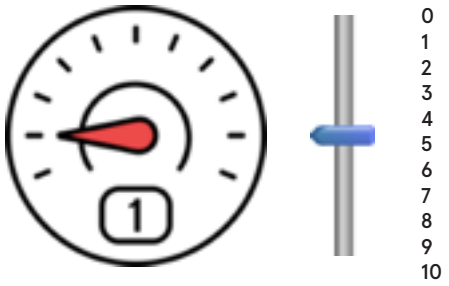
Q4.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q4.6 Where did you receive the training?

_____

Q4.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q4.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Formulate a hypothesis
- ○ Identify data to test a hypothesis
- ○ Make sure that data is timely, accurate and clean
- ○ Spot patterns from data
- ○ Predict trends from data
- ○ Store data securely
- ○ Share data responsibly
- ○ Communicate what data says

Q5.1 Open innovation

Source: Government Accountability Office. Retrieved from: https://www.gao.gov/products/GAO-17-14

What is it?

Open innovation describes the collaborative process of working across organisational boundaries to accelerate innovation by asking others for help defining or solving a problem. While originally used to describe how firms innovate using the external ideas of employees, suppliers and customers, open innovation has become commonplace in public institutions. It is sometimes called crowdsourcing, co-creation, ideation, brainstorming or public engagement. Open innovation skills include the ability to define a clear and compelling goal, determine appropriate incentives for participation, define the task for people to do and decide how to use their contributions.

Q5.2 Why does it matter?

Open innovation enhances both the effectiveness and legitimacy of policymaking. As we know from restaurant reviews on Yelp and medical discussions on WebMD or from reading entries on Wikipedia, productive knowledge is widely distributed. People have diverse forms of expertise, from lived experience to professional know-how. The value of more open innovation is that it leverages this collective intelligence to accelerate the solving of public problems. Show me an example:

Watch the video here.

In 2014, Mayor Eric Garcetti launched the new $1 Million City of Los Angeles Innovation Fund, which invites city employees to submit ideas on how to make the city more efficient and able to provide better service to residents. From 2014 – 2016, participants were encouraged to propose innovative ideas to improve a process, save time, increase collaboration among departments, provide the potential for long-term benefits, or generate revenue and/or cost savings. Hundreds of ideas were submitted, and 25 cost-saving ideas received funding and were implemented.

If you're interested in learning more about Open Innovation, here are some suggestions for further reading and watching:

- MIT Sloan, Using Open Innovation to Identify the Best Ideas
- Mozilla, Open Innovation Toolkit
- HHS Idea Lab, Open Innovation Toolkit

Now, please answer the following questions...

Q5.3 Select all that apply. Before this survey:

- ○ I could explain the skill of Open Innovation to others.
- ○ I (or my team) have used the skill of Open Innovation in our work previously.
- ○ I want to know more.
- ○ None of the above.

Q5.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

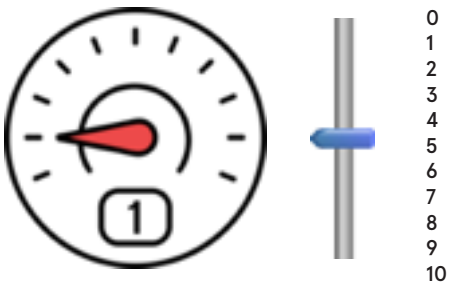
Q5.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q5.6 Where did you receive the training?

_____

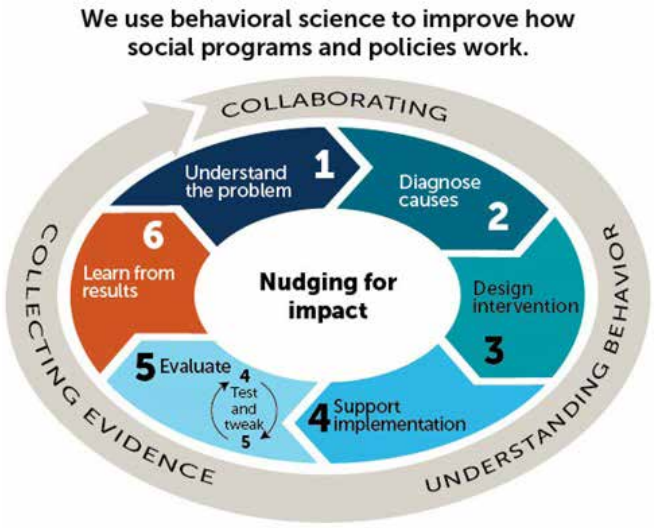
Q5.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q5.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Define a clear and compelling goal
- ○ Identify participants
- ○ Determine appropriate incentives
- ○ Define the task for people to do
- ○ Decide on assessment criteria
- ○ Decide how to use participants' contributions

Q6.1 Behavioural insights



Source: Mathematica Policy Research

What is it?

Using insights about human behaviour from psychology, cognitive science, and social science to develop and test policies and services that encourage individuals to make better decisions. Behavioural insights involve understanding behaviours related to an issue, prioritising key behaviours to change in order to achieve an outcome, and empirically testing the effectiveness of behaviour change strategies.

Q6.2 Why does it matter?

Behavioural insights aim at improving the welfare of citizens and consumers through policies and services that are formed based on empirically-tested results. It has been used across public services to generate low cost interventions to improve outcomes. Behaviour change can also make a big contribution to solving complex social, environmental and organisational problems. Show me an example:

Watch the video here.

In 2013 the Environment Protection Authority Victoria (EPA) was facing a decline in the payment of litter fines even though the fines for litter thrown out of cars were increasing. The EPA tested behaviour change approaches such as personalisation and loss aversion on the information that was presented to the offenders in order to encourage on-time payment. In addition, it modified the process for submitting statutory declarations to reduce the number of people avoiding payment. The trial showed an average increase of 13 per cent on the people who were avoiding late fines by paying on time, and an 18 per cent reduction in the number of people submitting statutory declarations.

- EAST: Four Simple Ways to Apply Behavioural Insights Toolkit
- OECD Behavioural Insights Toolkit
- Behaviour Works Method

Now please, answer the following questions...

Q6.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Behavioural Insights to others.
- ○ I (or my team) have used the skill of Behavioural Insights in our work.
- ○ I want to know more.
- ○ None of the above.

Q6.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

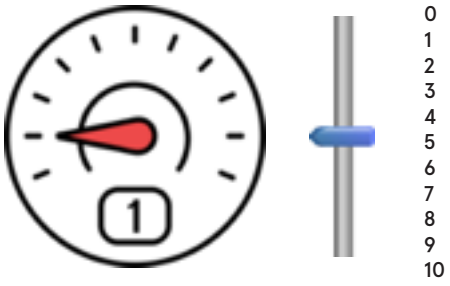
Q6.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q6.6 Where did you receive the training?

_____

Q6.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q6.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Identify problem, stakeholders and behaviours that need to change
- ○ Engage and consult stakeholders
- ○ Identify priority behaviours
- ○ Review and collect evidence of behavioural interventions
- ○ Design policy intervention based on behavioural insights (e.g. psychology, cognitive science)
- ○ Trial behavioural interventions
- ○ Adapt and scale-up interventions

Q7.1 Lean-agile methods

What is it?

Agile describes a new way of working that is dynamic, evolutionary and iterative and emphasises breaking down larger projects into smaller chunks. Instead of researching and planning a final product, policy or service from start to finish, practitioners of agile "think small," develop projects incrementally and assess progress frequently. Borrowed from the domain of software development, agile describes a new way of working in policy and service delivery as well. Agile methodology includes the skills of defining a "minimum viable product," testing and iterating in ongoing feedback loops.

Q7.2 Why does it matter?

An agile workflow that is both faster and smaller makes it possible to try out ideas before committing excessive time and money. By testing with real people early and often, instead of waiting to complete the final, comprehensive policy or service, practitioners increase the likelihood of delivering a solution that meets people's needs and reduce the risk of failure.

Show me an example:

Watch the video here.

Previously stalled, Denmark switched to re-developing its online business registration system using an agile approach. That is to say, they developed the project in modular bursts with frequent testing of prototypes on real users, and within three years were able to reduce the average time needed to resolve a customer's problems over the phone from 16 minutes to 5 minutes and dropped the number of customers needing phone support from 70 per cent of applications in 2009 to only 30 per cent today. (McKinsey).

If you're interested in learning more about Lean-Agile, here are some suggestions for further reading and watching:

- US Government Digital Services Playbook
- Harvard Kennedy School, The Path to Agile Policymaking
- Futurice, Lean Service Creation Handbook
- WEF, Agile Governance Whitepaper

Now, please answer the following questions...

Q7.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Lean-Agile to others.
- ○ I (or my team) have used the skill of Lean-Agile in our work.
- ○ I want to know more.
- ○ None of the above.

Q7.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

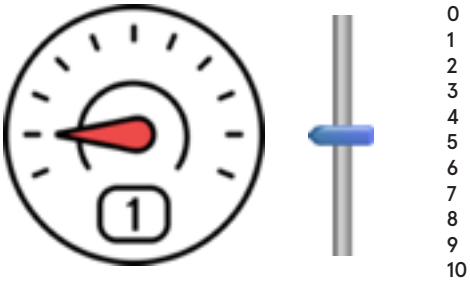
Q7.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q7.6 Where did you receive the training?

_____

Q7.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q7.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Define an overall vision for the project, policy or service
- ○ Define a "minimum viable product"
- ○ Collaborate across the team working on different pieces of the project
- ○ Determine how to test results of the MVP
- ○ Decide what to do next based on the results
- ○ Develop an agile project management plan

Q8.1 Impact evaluation methods

What is it?

Impact evaluation assesses the causal relationship between the program, policy or intervention and the outcomes of interest. The key characteristic of an impact evaluation is the identification of a counterfactual (what would have happened without the program) or control group. Impact evaluation involves the definition of a theory of change and outcome indicators, the identification of a counterfactual, knowing how to design randomised controlled trials, interpret results and scale learnings.

Q8.2 Why does it matter?

Impact Evaluation is central to public accountability as it provides a credible assessment on whether programs or policies achieved its intended impacts. The ultimate objective is to improve outcomes rather than just assessing outputs. It can also be used to test innovations and inform policy decision making on what works and what doesn't. Show me an example:

The Sacred Heart Mission in Victoria conducted in 2009 a randomised controlled trial to test the impact of the program "Journey to Social Inclusion" on chronic homelessness and social inclusion. The program consisted on providing intensive support to long-term homeless. Beneficiaries of the program were randomly selected and compared to a 'control group' (similar group that did not receive the program). After two years, results showed that the program had a positive impact on housing retention, physical well-being and savings for government of up to $32,080 per participant. The program had no impact on drug use and jobs. Learnings from the pilot were used to refine and expand the second phase of the project which is currently being tested.

- World Bank, Impact Evaluation in Practice Handbook
- MIT Open Courseware, JPAL Executive Training: Evaluating Social Programs

Now, please answer the following questions...

Q8.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Impact Evaluation to others.
- ○ I (or my team) have used the skill of Impact Evaluation in our work.
- ○ I want to know more.
- ○ None of the above.

Q8.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

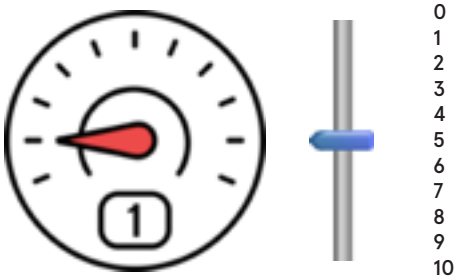
Q8.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q8.6 Where did you receive the training?

_____

Q8.7 How important is it to you professionally to learn this skill? (from 0-10, with 0 being "not at all important" to 10 being "extremely important")



Q8.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Define theory of change
- ○ Define outcome indicators
- ○ Identify a testable question
- ○ Design an experiment within a program/ project
- ○ Use randomisation
- ○ Use non-experimental methods (e.g. propensity score matching)
- ○ Analyse the results
- ○ Make strategic decisions based on the learnings (e.g. scale-up/modify/shut-down program)

Q9.1 Evidence synthesis

What is it?

Evidence synthesis is the process of assessing what is already known about a policy or practice issue from academic and grey literature to inform policy-making. It involves a systematic review process of identifying and critically evaluating research from various sources and disciplines. Evidence synthesis involves the development of a research question, the selection of criteria to search and select the research to be considered systematically, appraisal of the evidence and applicability of findings.

Q9.2 Why does it matter?

It informs decision making with recommendations for practice of what worked and what didn't in a specific context, what remains unknown and uncertain. Show me an example:

In 2017 New South Wales adopted a container deposit recycling scheme (CDR) with the objective of reducing waste from drink containers. The decision was informed by systematically collected evidence and analysis of 47 examples of CDR schemes or trials around the world. The evidence synthesis informed NSW policy makers on the impact of CDR schemes on waste reduction, under which conditions they work best and operational feasibility. See full article.

If you're interested in learning more:

- Selecting Approaches for Rapid Review Starr

Now, please answer the following questions...

Q9.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Evidence Synthesis to others.
- ○ I (or my team) have used the skill of Evidence Synthesis in our work.
- ○ I want to know more.
- ○ None of the above.

Q9.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

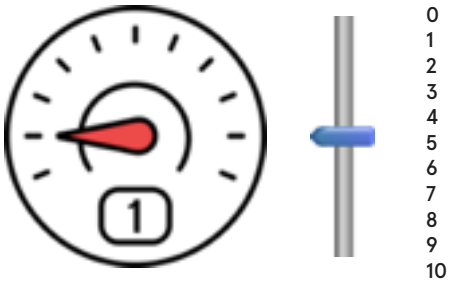
Q9.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q9.6 Where did you receive the training?

_____

Q9.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q9.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Frame research question
- ○ Define search criteria
- ○ Search for evidence and selection of studies according to criteria
- ○ Assess the quality of studies
- ○ Summarise findings
- ○ Determine applicability of findings
- ○ Make strategic decisions based on learnings

Q10.1Systems thinking

What is it?

Is a broad analytical approach that aims to uncover the dynamic relationships and correlations between the elements of a system. It consists of identifying and understanding the relevant stakeholders, regulations, norms, structures and patterns that interact in a system (OECD 2015). Systems thinking leverages quantitative and participatory approaches to model the systems or subsystems of interest.

Q10.2 Why does it matter?

Complex policy problems are frequently presented as interdependent challenges where there is no linear relationship between causes and effects. Systems thinking methods enable decision makers to understand the links within a system, identify drivers of change and avoid unintended consequences. Show me an example:

The Australian National Outlook project, led by CSIRO and the National Australia Bank, brings together leaders from more than 20 organisations across business, research and civil society to produce integrated economic, social and environmental modelling that paints the big picture for a national conversation about Australia's future to 2060. The project combines CSIRO's research methodology in integrated modelling with social, environmental and economic data and expert perspectives, to consider where Australia might be in decades to come. This systems modelling is used as the basis for proposing five major system shifts — in industry, energy, urban, land and culture.

Now, please answer the following questions..

Q10.3 Select all that apply. Prior to this survey:

- ○ I could explain the skill of Systems Thinking to others.
- ○ I (or my team) have used the skill of Systems Thinking in our work.
- ○ I want to know more.
- ○ None of the above.

Q10.4 How often have you (or your team) used this skill in the last year?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

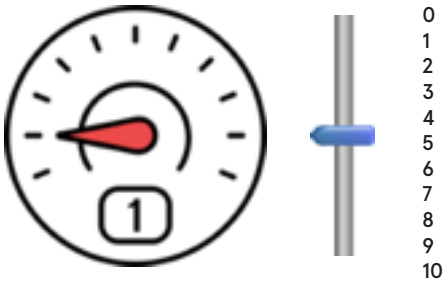
Q10.5 Have you had any formal training in this skill? If so, please tell us where.

- ○ Yes
- ○ No

Q10.6 Where did you receive the training?

_____

Q10.7 How important is it to you professionally to learn this skill? (from 0–10, with 0 being "not at all important" to 10 being "extremely important")



Q10.8 You indicated that you (or your team) have used this skill in your work previously, briefly tell us which of these sub-skills you have also used:

- ○ Participatory problem definition and stakeholder identification (systems mapping)
- ○ Causal loop modelling
- ○ Dynamic modelling
- ○ Scenario planning and modelling
- ○ Strategy development and testing

Q11.1 How you want to learn

For those innovation skills you indicated the desire to learn more about, please tell us where you prefer to learn and obtain training (check all that apply):

- ○ At home
- ○ At work
- ○ On my commute
- ○ At a training/education site

Q11.2 For those innovation skills you indicated the desire to learn more about, please tell us more about how you prefer to learn and obtain training (check all that apply):

- ○ Face to face (e.g. classroom-based education)
- ○ Online (e.g. online course)
- ○ Self-paced (e.g. give me a reading list/toolkit)

Learning Preferences

Q11.3 What face to face formats would you prefer (choose one)?

- ○ One-day intensive workshop
- ○ Multiple-days in a row
- ○ Multiple-days spread out (e.g. every other weekend or once a month)

Q11.4 What online formats would you prefer? (choose one)

- ○ Short and more often (e.g. a series of many short videos or podcasts)
- ○ Longer and less often (e.g. a series of a few long lectures)

Q11.5 Would you be interested in coaching/mentoring by subject-matter experts to help you advance your own work?

- ○ Yes
- ○ No

Q11.6 Please indicate features of innovation skills training programs that are important to you (check all that apply)

- ○ Ability to receive credit
- ○ Ability to receive a degree
- ○ Ability to work on project of my choosing
- ○ Accommodation for disabilities
- ○ Clear understanding of skills I will obtain/ what I will learn
- ○ Clear communication to employers of skills I obtain
- ○ Cost/affordability
- ○ Convenient face-to-face locations
- ○ Domestically-renowned instructors
- ○ Diverse instructors
- ○ Flexible start and end dates
- ○ Flexible, self-paced schedule
- ○ Getting credit at work for taking the program
- ○ Hands-on problem-based learning
- ○ High-quality peers/classmates
- ○ High quality content
- ○ Internationally-renowned instructors
- ○ Instructors with a strong theoretical grounding
- ○ Instructors with a successful track record in practice
- ○ Learning with people from my own organisation
- ○ Learning with people across organisations
- ○ Online learning options
- ○ Understanding outcomes for those who take the program
- ○ Other

End of Block: How I Learn

Start of Block: Environment — SES

Innovation Environment — (Executive level)

Q12.1 How significant is each of the following factors in motivating the implementation of new practices or initiatives in your organisation?

	Extremely Important	Very important	Moderately important	Slightly important	Not at all important
Potential for increased productivity	○	○	○	○	○
Potential for budget savings	○	○	○	○	○
Potential for increased customer satisfaction	○	○	○	○	○
Pressure from residents/customers	○	○	○	○	○
Pressure from businesses/industry	○	○	○	○	○
Pressure from employees or unions	○	○	○	○	○
Pressure from elected officials	○	○	○	○	○
Compliance with new laws or regulations	○	○	○	○	○

Q12.2 How significant is each of the following factors in *hindering* the implementation of new practices or initiatives in your organisation?

	Extremely Important	Very important	Moderately important	Slightly important	Not at all important
Availability of funding	○	○	○	○	○
Lack of information on how to proceed	○	○	○	○	○
Current organisational structure	○	○	○	○	○
Current organisational culture	○	○	○	○	○
Resistance from employees or unions	○	○	○	○	○
State or federal policies or regulations	○	○	○	○	○
Lack of internal expertise	○	○	○	○	○
Challenges coordinating across agencies/ departments	○	○	○	○	○
Lack of public interest	○	○	○	○	○
Opposition from elected officials	○	○	○	○	○

Innovation Environment — (Non-Executive level)

Q13.1 How well do the following apply to your organisation?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
Staff have incentives to think of new ideas and take part in their development	○	○	○	○	○	○
Managers give high priority to developing new ideas or new ways of working	○	○	○	○	○	○
Senior management is willing to take risks to support new ideas	○	○	○	○	○	○
My organisation provides funding to develop and test new ideas	○	○	○	○	○	○
My organisation provides training to develop and test new ideas	○	○	○	○	○	○
We take an evidence-based approach to most things in my organisation	○	○	○	○	○	○
My organisation regularly evaluates its programs and activities	○	○	○	○	○	○
My organisation values proven results	○	○	○	○	○	○
We don't do much to track our organisation's outcomes	○	○	○	○	○	○
Users/clients are systematically involved in the design or planning of new or improved services, products and/or policies	○	○	○	○	○	○
We use technology to collect and analyse data for decision making	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other branches within my organisation	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other public sector organisations	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other sectors such as NGO, academia/business	○	○	○	○	○	○

Q13.2 How well do the following apply to your branch?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know
Users/clients are systematically involved in the design or planning of new or improved services, products and/or policies	○	○	○	○	○	○
We use technology to collect and analyse data for decision making	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other branches within my organisation	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other public sector organisations	○	○	○	○	○	○
We share information, discuss problems and find solutions together with other sectors such as NGO, academia/business	○	○	○	○	○	○

Q13.3 In the last year, did your branch introduce new or significantly improved: (tick all that apply)

- ○ Services
- ○ Methods of producing services or goods (techniques, equipment, software)
- ○ Delivery methods (logistics or delivery for inputs, services or goods)
- ○ Supporting activities for your processes and/or management systems (e.g. Maintenance systems, operations, lean management)
- ○ Systems for gathering new knowledge and building capacity (knowledge management systems, education/training systems)
- ○ Systems to engage with external organisations, businesses and other stakeholders
- ○ Methods of promoting the organisation or its services and goods (e.g. branding, non-functional design, campaigns, media)
- ○ Methods of influencing the behaviour of users, citizens or others (e.g. campaigns, media)
- ○ Strategy for meeting the policy goals of your department, agency or other government organisation
- ○ None
- ○ Don't Know

Q13.4 What was the impact of the most important new or significantly improved services, processes or methods indicated above (choose the most relevant):

- ○ Improved Efficiency (e.g. reduced costs, simplifying administrative procedures)
- ○ Improved Quality (e.g. improved health outcomes)
- ○ Improved Reach (e.g. improved targeting, new beneficiaries).
- ○ Faster Delivery time
- ○ Improved user satisfaction/perception.
- ○ Improved employee satisfaction/working conditions
- ○ No impact

ANNEX III

LIST OF INTERVIEWEES

The authors would like to acknowledge the following interviewees for their input to this report. While their contributions are welcomed, the authors assume all responsibility for any interpretations made or implied in this report.

Mary Wiley-Smith
Deputy Public Service Commissioner (Federal)

Emma Hogan
NSW Public Service Commissioner

Paul Grimes
Victorian Public Service Commissioner

Sarah Pearson
Chief Scientist and Chief Innovation Officer, Department of Foreign Affairs and Trade

Janna McCann
General Manager, BizLab, Department of Industry, Innovation and Science

William Murphy
Acting Deputy Secretary, Customer Deliver and Transformation,
NSW Department of Finance, Services and Innovation

Jane King
Deputy Commissioner, Machinery of Government Transition, Australian Taxation Office

Blair Comley
Director, Port Jackson Partners

Gill Callister
ANZSOG, Associate Dean

Jude Barling
ANZSOG, Director, Government Relations

Michael Mintrom
Monash University, Professor of Public Sector Management

David Ireland
Principal and Global Innovation Lead, ThinkPlace

Liam Smith
Director, BehaviourWorks Australia, Monash Sustainable Development Institute

Robyn Mildon
CEO, Centre for Evidence and Implementation

ENDNOTES

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