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Please cite this publication as:
OECD (2017), *Systems Approaches to Public Sector Challenges: Working with Change*, OECD Publishing, Paris.
http://dx.doi.org/10.1787/9789264279865-en

ISBN 978-92-64-27985-8 (print)
ISBN 978-92-64-27986-5 (PDF)

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challenge the *modus operandi* of public sector institutions, thus creating the conditions for introducing experimentation in government.

Initiating and sustaining systems change over time also requires the involvement of senior management, especially when attempting to transform long-established and complex systems. However, leadership is not enough: the participation of a critical mass of actors representing different positions and roles – all of whom understand the need for change and are willing to act on it – is crucial for achieving results. In the Netherlands, the board of directors of the Amsterdam Child and Youth Protection Services supported a change process that lasted for over five years. In Iceland, the heads of police, social services and child protection had to work together to make domestic violence a priority.

Systems approaches require working across organisational boundaries and government levels. For example, in Canada there were concerted efforts at both the municipal and provincial level to help establish a sharing economy. In the Netherlands, although transforming the child protection system began with change in one organisation, it soon became clear that the rest of the supporting structures, from accompanying services to the legal framework, had to be reformed to achieve real results. Once systemic changes are institutionalised it becomes more difficult to return to the "old way of doing things".

Meaningful measurement and feedback mechanisms function as the cornerstones of successful systems change. In policy making there is often a gap between policy design and implementation, especially when addressing complex problems. The case studies highlighted the need for measures that link directly to the *purpose* of systems, such as the Netherlands' approach to child protection and Iceland's risk assessment framework for domestic violence.

Time is an essential resource in systems change: people need to live through and experience the change rather than hearing about it from a third party. The timing of change is thus crucial. In order to implement the Experimental Policy Design programme in Finland, for example, stakeholders had to accelerate their discussions and insert the topic of experimentation into the next government programme during national elections. Both the Dutch and the Icelandic cases illustrate the difficulties of rapidly scaling up change. In order for change to "stick", people need time to internalise the solutions.

Additionally, new, more agile and iterative financing measures must be created to support the use of systems approaches. In the cases of both Canada and Finland, dedicated non-government partners had to invest more time and energy into the projects than was initially planned. In the Dutch case, the initial investment needs exceeded the available resources of the organisation and had to be found elsewhere – though, ultimately, the change produced a 22% reduction in costs per service user. Better instruments are therefore needed to assess the initial return on investment and to track how benefits from systems change are realised and to whom they accrue.

While this report provides some initial insights into the theory and practice of system approaches in the public sector, further work is needed to gather information from relevant experiences and to draw lessons from cases studies in order to develop guidance for policy makers undertaking systems change.

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Created from aalto-ebooks on 2017-12-04 07:59:53.

Kaasa, A. (2013), "Culture as a possible factor of innovation: Evidence from the European Union and neighbouring countries", *SEARCH Working Paper*. European Commission, Brussels.

Kamensky, J.M. (2011), "Managing the complicated vs. the complex", *The Business of Government Magazine*, Fall/Winter/2011, pp. 66-70, www.businessofgovernment.org/sites/default/files/JohnKamensky.pdf.

Kapustina, V. et al. (2014), "System analysis of waste oil management in Finland", *Waste Management and Research*, Vol. 32/4, pp. 297-303.

Kattel, R. et al. (2014), "Can we measure public sector innovation? A literature review", *LIPSE Working Papers*, 2, 1-45.

Kay, R. and C. Goldspink (2012), What Public Sector Leaders Mean When They Say They Want to Innovate. Incept Labs, Sydney, Australia.

Kelly, J.M. (2005), "The dilemma of the unsatisfied customer in a market model of public administration", *Public Administration Review*, Vol. 65/1, pp. 76-84.

Kingdon, J.W. (1995), *Agendas, Alternatives, and Public Polocoes*. HarperCollins College Publishers, New York.

Lægreid, P., P.G. Roness and K. Verhoest (2011), "Explaining the innovative culture and activities of state agencies", *Organization Studies*, Vol. 32/10, pp. 1321-1347.

Lane, D.C., E. Munro and E. Husemann (2016), "Blending systems thinking approaches for organisational analysis: Reviewing child protection in England", *European Journal of Operational Research*, Vol. 251/2, pp. 613-623.

Lember, L., R. Kattel and P. Tõnurist (2016), "Public administration, technology and administrative capacity", *Working Papers in Technology Governance and Economic Dynamics*, Vol. 72, pp. 1−30.

Leonard, D.K. (2010), "Pockets of effective agencies in weak governance states: Where are they likely and why does it matter?", *Public Administration and Development*, Vol. 30/2, pp. 91–101.

Lundberg, K. (2011), "A systems thinking approach to environmental follow-up in a Swedish central public authority: Hindrances and possibilities for learning from experience", *Environmental Management*, Vol. 48/1, pp. 123-133.

Lusch, R. and S. Vargo (eds.) (2006), *The Service Dominant Logic of Marketing*. M.E. Sharpe, New York.

LVM (Ministry of Transport and Communications) (2016), *Rapporteurs to Explore the Future of the Transport and Communications System*, Press Release, 9 September 2016, LVM, Helsinki, www.lvm.fi/en/-/rapporteurs-to-explore-the-future-of-the-transport-and-communications-system.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2/1, pp. 71-87.

McCann, L. (2013), "Reforming public services after the crash: The roles of framing and hoping", *Public Administration*, Vol. 91/1, pp. 5–16.

Mulgan, G. (2005), Government, knowledge and the business of policy making: The potential and limits of evidence-based policy, *Evidence and Policy: A Journal of Research, Debate and Practice*, Vol. 1/2, pp. 215-226.

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Created from aalto-ebooks on 2017-12-04 08:00:37.

Munro, E. (2011a), Munro Review of Child Protection: Final Report, UK Department of Education, London, www.gov.uk/government/uploads/system/uploads/attachment_data/file/175391/Munro-Review.pdf.

Munro, E. (2011b), *Munro Review Of Child Protection: Interim Report – the Child's Journey*. UK Department of Education, London, www.gov.uk/government/uploads/system/uploads/attachment_data/file/206993/DFE-00010-2011.pdf.

Munro, E. (2010), *Munro Review of Child Protection: Part 1 – A Systems Analysis*. UK Department of Education, London, www.gov.uk/government/uploads/system/uploads/attachment_data/file/175407/TheMunroReview-Part_one.pdf.

Munro, E.R. and C. Lushey (2012), The impact of more flexible assessment practices in response to the Munro Review of Child Protection: Emerging findings from the trials. UK Department of Education, London, www.gov.uk/government/uploads/system/uploads/attachment_data/file/181503/CWRC-00088-2012.pdf.

National Accounting Office (NAO) (2006), *Achieving Innovation in Central Government Organizations*. National Accounting Office, London.

OECD (2017), *Embracing Innovation in Government – Global Trends 2017,* OECD, Paris, www.oecd.org/gov/innovative-government/embracing-innovation-in-government.pdf.

OECD (2016), "World Government Summit: Call for Public Innovations, Observatory of Public Information", OECD, Paris, www.oecd.org/governance/observatory-public-sector-innovation/blog/page/worldgovernmentsummitcallforpublicinnovations.htm.

OECD (2015), "Systems Innovation: Synthesis Report", OECD, Paris, www.innovationpolicyplatform.org/system-innovation-oecd-project.

Osborne, S.P. and L. Brown (2011), "Innovation, public policy and public services delivery in the UK: The word that would be king?", *Public Administration*, Vol. 89, pp. 1335-1350.

Osborne, S.P., Z. Radnor and G. Nasi (2013), "A new theory for public service management? Toward a (public) service-dominant approach", *American Review of Public Administration*, Vol. 43/2, pp. 135-158.

Overman, S. and S. Van Thiel (2016), "Agencification and Public Sector Performance: A systematic comparison in 20 countries", *Public Management Review*, Vol. 18/4, pp. 611-635.

Pärna, O and N. von Tunzelman (2007), "Innovation in the public sector: Key features influencing the development and implementation of technologically innovative public sector services in the UK, Denmark, Finland and Estonia", *Information Polity,* Vol. 12, pp. 109-125.

Pepper, M., A. Sense and K. Speare (2016), "Systems pluralism in infrastructure decision-making for socially connected greenfield communities", *Systemic Practice and Action Research*, Vol. 29/2, pp. 129-148.

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OECD, Publishing. Systems Approaches to Public Sector Challenges - Working with Change, OECD Publishing, 2017. ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/aalto-ebooks/detail.action?docID=4985635.
Created from aalto-ebooks on 2017-12-04 08:00:37.

Peters, B.G., J. Pierre and D.S. King (2005), "The politics of path dependency: Political conflict in historical institutionalism", *The Journal of Politics*, Vol. 67/4, pp. 1275-1300.

Pilli-Sihvola, E. et al. (2015), "Robots on land, in water and in the air. Promoting intelligent automation in transport services", *Publications of the Ministry of Transport and Communications*, 14/2015.

Potts, J. and T. Kastelle (2010), "Public sector innovation research: what's next?", *Innov.: Manage. Policy Pract.,* Vol. 12, 122-137.

Powell, M. et al. (2010), "Broadening the focus of public service consumerism", *Public Management Review*, Vol. 12, pp. 323-340.

Rittel, H.W. and M.M. Webber (1973), "Dilemmas in a general theory of planning", *Policy Sciences*, Vol. 4/2, pp. 155-169.

Scottish Government (2016), *Scotland's National Performance Framework (NPF)*, slides, June 2016, www.gov.scot/Resource/0049/00497339.pdf.

Seddon, J. (2008), Systems thinking in the public sector: The failure of the reform regime... and a manifesto for a better way. Triarchy Press Limited, Axminster, UK.

Seddon, J. (2003), *Freedom from Command and Control*. Vanguard Press, Buckingham, UK.

Snowden, D.J. and M.E. Boone (2007), "A leader's framework for decision making", *Harvard Business Review*, Vol. 85/11, p. 68.

Stanhope, V. and K. Dunn (2011), "The curious case of Housing First: The limits of evidence based policy", *International Journal of Law and Psychiatry*, Vol. 34/4, pp. 275-282.

Torugsa, N. and A. Arundel (2015), The nature and incidence of workgroup innovation in the Australian public sector: Evidence from the 2011 State of the Service survey", *Australian Journal of Public Administration*, Vol. 75, pp. 202-221.

Turner, V. (1997), *The Ritual Process*. Cornell University Press, Ithaca, NY.

van Acker, W. and Bouckaert, G. (2015), *Mapping and Analysing the Recommendations of Ombudsmen, Audit Offices and Emerging Accountability Mechanisms*, LIPSE: Learning from Innovation in Public Sector Environments (Work Package 3), European Policy Brief, LIPSE, Brussels, www.lipse.org/upload/publications/LIPSE%20WP3%20Policy%20Brief_20150324_ENG.pdf.

Verma, A. (2012), Skills for competitiveness: Country report for Canada. *OECD Local Economic and Employment Development (LEED) Working Papers*, 3, pp. 1-84.

Vittersø, G. and T. Tangeland (2015), "The role of consumers in transitions towards sustainable food consumption: The case of organic food in Norway", *Journal of Cleaner Production,* 92, pp. 91-99.

Walker, R.M. (2013), "Internal and external antecedents of process innovation: A review and extension", *Public Management Review*, 16, pp. 21-44.

Wauters, B. and M. Drinkgreve (2016), Improving the Quality of Public Service and Reducing Costs: Lessons from the Youth Protection Agency of Amsterdam

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OECD, Publishing. Systems Approaches to Public Sector Challenges - Working with Change, OECD Publishing, 2017. ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/aalto-ebooks/detail.action?docID=4985635.
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(Netherlands). Case study. Mortsel, Belgium, www.latitudeconsulting.eu/images/childprotect.docx.

WHO (2009), Systems Thinking for Health Systems Strengthening. WHO Press, Geneva.

Further reading

Arundel, A. and D. Huber (2013), "From too little to too much innovation? Issues in monitoring innovation in the public sector", *Structural Change and Economic Dynamics*, Vol. 27, pp. 146-149.

Bergen, P. and A. Reynolds (2005), "Blowback revisited: Today's Insurgents in Iraq Are tomorrow's terrorists", *Foreign Affairs*, Vol. 84, p. 2.

Betts, J. and R. Holden (2003), "Organisational learning in a public sector organisation: A case study of muddled thinking", *Journal of Workplace Learning*, Vol. 15, pp. 280-287.

Bloch, C. and M.M. Bugge (2013), "Public sector innovation – from theory to measurement. *Structural change and economic dynamics*", Vol. 27, pp. 133-145.

Jackson, M.C. et al. (2008), "Evaluating systems thinking in housing", *Journal of the Operational Research Society*, Vol. 59/2, pp. 186-197.

OECD (2011), "Innovation in Public Service Delivery: Context, Solutions and Challenges", OECD, Paris.

ODPM (Office of the Deputy Prime Minister) (2005), A Systematic Approach to Service Improvement Evaluating Systems Thinking in Housing. ODPM Publications, London.

Seadon, J.K. (2010), "Sustainable waste management systems", *Journal of Cleaner Production*, Vol. 18/16, pp. 1639-1651.

Vargo, S.L. and R.F. Lusch (2008), "Service-dominant logic: Continuing the evolution", *Journal of the Academy of Marketing Science*, Vol. 36/1, pp. 1-10.

Vargo, S.L. and R.F. Lusch (2004), "Evolving to a new dominant logic for marketing", *Journal of Marketing*, Vol. 68/1, pp. 1-17.

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Chapter 2.

Towards a framework for systems transformation

This chapter starts by highlighting the multi-method nature of new systems-based practices. It discusses how systems thinking differs and complements design thinking, and how design can be used in systemic change processes. It discusses how, under conditions of complexity and uncertainty, governments can reflect in action and work with relative precision. The chapter discusses how decision makers and public services managers can consider the kinds of challenges they face, the resources available to them and what they can expect while engaging in a rigorous problem-solving process using systems approaches. Following this discussion, the chapter identifies some key principles and tactics – people and place, dwelling, connecting, framing, designing, prototyping, stewarding and evaluating – involved in using systems approaches in the public sector. Specific practices are dependent on the context, institutional capacity, problem, timeframe and resources available to public administrations as they embark on systems change.

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New systems-based practices

Innovative approaches to problem solving and service delivery are proliferating across governments that are contending with complex problems for which there are few precedents or solutions. Front-line public servants are simultaneously dealing with "customers" who have come to expect tailored, responsive products and services similar to those they routinely experience in their interactions with business, especially the tech industry.

The inability of command and control systems to cope with these demands has created a vacuum into which new systems-based practices are stepping. However, many of these efforts remain at the margins, often organised into "labs" that have the space and mandate to innovate government processes. They have yet to move toward the centre of government or to tackle the norms and standards that dictate the behaviour of civil servants. The following include notable efforts to promote systems-based practices:

- In the United Kingdom, NESTA has worked to build an ecosystem of systems and design-based practices around government through its social innovation programmes, i-teams and Creative Councils, among others. The Centre for Aging Better also promotes systems-based practice (see Box 1.3).
- SITRA's Helsinki Design Lab, Strategy Unit and partnerships with organisations such as Demos Helsinki have deployed systems approaches on issues such as clean tech and urban decarbonisation. They have also worked to develop the theoretical and practical underpinnings of systems approaches and strategic design.
- The MaRS Discovery District in Toronto hosts organisations and businesses with the potential to be change agents, and helps to build their capacity and expertise. The MaRS Solutions Lab works at the intersection of design and systems thinking to develop solutions, policy and capacity around complex societal challenges such as health, work and food. Their *Periodic Table for Systems Change* (see Figure 3.14 in Chapter 3) provides a useful framework for understanding the different kinds of elements required to navigate and alter complex systems.
- In the United States, the Office of Personnel Management's Lab@OPM works to disseminate design and systems-based practices and tools across government through training programmes for government workers and contractors. It also provides a platform to bring together other federal agencies to address complex challenges.
- MindLab, Denmark's cross-government innovation group, emphasises the importance of citizen involvement, voice and co-creation, all of which necessitate systems approaches. Its staff includes designers, sociologists, ethnographers and other professionals who work in blended teams together with citizens.
- The Australian Centre for Social Innovation (TACSI), a not-for-profit funded by government, applies design and social research to co-creative processes in order to tackle difficult social, economic and environmental problems. They search for ways to crack "open the current system at crisis points" (Puttick, Baeck and Colligan, 2014) and develop new services to fulfil unmet or neglected needs. Their well-known "Family by Family" project is a good example of this approach. By working to address the seemingly intractable problem of dysfunctional

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families, TACSI aims to reduce the growing demands on social services by pairing families that have overcome crises with families currently in the midst of crisis. Their critical insight was not to ask how to mitigate chronic stress, but to imagine what might a successful family under difficult circumstances look like. Once they had established that the target was thriving families, not mitigation, they were able to design better, more impactful services.

Systems thinking and design thinking: different but complementary approaches

There is currently a surge of interest in *design thinking* in the public sector, especially in relation to co-designing public services with citizens through participatory processes.[1] (The proliferation of "sticky notes" in government offices is a strong sign of this shift – see the section in this chapter on *People and place*). However, the interlinkages between service design and systems thinking have to be made clear, especially as regards the emergence of "design thinking" (Rowe, 1987) and design management (e.g. see Cooper Junginger and Lockwood, 2009). The former denotes the use of design methods to match consumer needs and value, taking into consideration technological viability and business strategy (see Brown, 2008; Martin, 2009), while design management is geared more towards prototyping, although some approaches also include elements from systems thinking (e.g. understanding user experiences, ideation, rapid prototyping and systems visualisation) (Mulgan, 2014).

The increased popularity of "design thinking" in the policy realm has led to the proliferation of different toolboxes and guides on how to use design and design thinking in the public sector, some of which mention systems thinking in combination with design tools.[2] In general, these methodologies try to rationalise change processes within the public sector and are therefore reductionist to a degree. (By definition, tools and toolkits that are divorced from the underlying principles used to create them constitute a reductionist approach even when labelled "systemic".) There is friction between the context-specific nature of systems analysis and the latest push for a generic "toolbox" approach in the public sector. Nevertheless, designers working in the public sector also see themselves as craftsmen, designing for contextual demands and user needs in practice, and not for archetypical situations.

However, there are no clear-cut guidelines as to how systems thinking and design thinking approaches fit together. Some publications regard system thinking as a part of a larger design skill-set (Mulgan, 2014), while others apply design as a tool within a larger systems thinking approach (e.g. see Gharajedaghi, 2011). The origins of systems thinking and design thinking are clearly different – design thinking originated from product design approaches[3] and design emerged more broadly from architecture and product design – however, they are interlinked concepts. Systems thinkers were already using design as a concept in the 1980s, albeit largely as a "problem-solving tool" (e.g. Ackoff 1981; Argyris and Schön, 1978). What is important to note is that *systems thinking is not just systematic design*. Systems thinking at its core is oriented towards organisational learning – reflection in action. However, the practical application of systems thinking is often characterised by a narrow focus on systematic design (Li, 2002: 387).

Design is a useful bridge for integrating systems thinking into everyday organisational learning (ibid.: 392). Hence, some view the popular combination of design thinking with evidence-based policy making as a means to rejuvenate interest in systems thinking in the public sector (Wastell, 2010). However, design thinking tends to deal with events, problems and the application of tools. It concentrates on action, prototyping

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("thinking through doing") and is usually associated with Herbert Simon's rational-technical problem-solving logic (Dorst and Royakkers, 2006). In many cases, the feedback loop from an implementation phase is weak (which represents a clear break from traditional design practices). Furthermore, rational problem solving may not account for more complex changes in value distribution. This is particularly notable in cases where policy makers select a solution that is unsatisfactory overall but satisfies current conditions (ibid.), potentially resulting in piecemeal solutions that hide underlying structural policy problems. Accordingly, service designers that concentrate on second or third-order design problems directly connected to user needs may neglect fourth-order design problems[4] – systems integration – which are often linked to wicked problems (Junginger, 2014: 148-149).

For example, design methodologies employed by public sector innovation labs often use rapid prototyping; however, many of these solutions do not fit within the broader public service system (Tõnurist, Kattel and Lember, 2015). This makes it difficult to move beyond experimentation to long-term exploration.[5] A systemic design guide published by Alberta CoLab exemplifies this approach (Box 2.1). While Alberta CoLab use many systems thinking tools, they do not tackle implementation, which in the public policy context may constitute the most difficult part of the process due to feedback from traditional institutions, established bureaucratic procedures and short political lifecycles.

Box 2.1. CoLab's systemic design field guide (Canada)

In 2016, Alberta CoLab published the guide *Follow the Rabbit: A Field Guide to Systemic Design.* It was developed with staff of the Government of Alberta in mind, but can be applied to different public policy areas, sectors and intersections.

CoLab outlined five key characteristics of systemic designers – they are inquiring, open, integrative, collaborative and centred. Accordingly, they adopted a simple formula: playfulness + discipline = creativity.

The guide describes a systemic design project, introducing the following phases for systems design projects: planning, workshops and evaluation. The methods used include steps such as "look" (which includes tools such as interviewing for empathy, empathy maps, keep asking why and ethnography); "frame" (rich pictures, systems maps, iceberg diagrams, CLDs, concept maps, six thinking hats, speed dating, affinity diagrams, card sorts and world cafes); "generate" (participatory prototyping and dotmocracy) and "adapt" (reflection and action space).

According to the guide, the nature of the problem should be outlined during the planning phase. A systemic design approach should be used only if the problem is complex, otherwise, such an approach would be deemed "overkill". Additional important questions to consider include: Is the client open to change? Does the client have "top cover" (i.e. a senior-level champion)? Is the client committed (i.e. has adequate resources and willing to implement the project)? And, most critically: Has the client been identified?

"Sequencing" plays an important role during project workshops and involves: bringing in external perspectives, ideation, testing, integrating findings, evaluating processes, implementing and sharing results, and maintaining momentum during workshops. Certain specific roles need to be allocated including a facilitator (usually an outside designer), recorder, note taker and narrator. Each workshop is followed by an evaluation and, after a few months, a "check back" to take note of any progress or changes. The approach is design centred and focuses on workshops, but does not explore implementation.

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Systems thinking helps to place a managerial problem into context as a part of systems events (e.g. a discrete client-service interaction), and patterns and structures (rather than events alone for which design solutions are applied).[6] At the same time, systems thinking can over-emphasise analysis ("thinking it through") and neglect action, which may result in problems. In practice, the two approaches are complementary. The danger is that both approaches tend to become overly rigid when applying their specific methodologies, which can limit their use in broader policy-making circles.

Design has always been concerned with the interactions between people and things. For much of its history, these things have tended to be objects. But, increasingly, design is working at the intersection of people, processes and outcomes, making it particularly relevant for managing a transition towards human-centred policies and services. Human-centred design (HCD), strategic design, design thinking and other variations have gained traction in many administrations that are moving to re-orient processes around their citizens. Other systems approaches are also well positioned to better incorporate citizens' interests into public services as principal stakeholders.

Strategies to manage complexity: What are the options for the public sector?

Complexity arises when systems are not configured to respond to the challenges they face. Ashby's law states that any control system must be at least as complex as the system it is controlling, otherwise a complexity gap will arise from the mismatch.[7] For example, in a tax regime where legislators create increasingly complex regulations, constituents will always be able to develop more means of evading taxes than regulators can address. This situation results from the variety and quantity of avoidance schemes available to lawyers, accountants and tax advisors, which are then multiplied by the variety of individual circumstances. The solution to this complexity gap is not to make tax policy more complex, but to reduce the variety of options available to the public by simplifying the tax regime (Casti, 2012: 56). In essence, reduced variety on the regulatory side will result in a reduced number of responses on the part of those being regulated. Ashby's law may be the most important principle to consider when working on – and especially developing interventions for – complex systems.

Complexity scholars Max Boisot and Bill McKelvey have revived Ashby's law and applied it to the contemporary debate around managing organisations in increasingly complex environments. Their Law of Requisite Complexity holds that "to be efficaciously adaptive, the internal complexity of a system must match the external complexity it confronts" (McKelvey and Boisot, 2009). With respect to managing complexity, organisations have two principal adaptation strategies. The first is to simplify or reduce the complexity of incoming stimuli so as to minimise internal complexity. Such *complexity reduction* can be achieved through abstraction – for example, by creating theoretical models that make information more manageable or actionable. There are risks associated with this strategy that stem from oversimplification, such as in the banking sector where securitisation of residential mortgages shielded unaccounted risks, leading to the global financial crisis. Examples from the public sector abound, but at a systemic level, the organisation of domain authority into ministries is a form of simplification or complexity reduction. For instance, the housing sector is responsible for a significant portion of energy consumption, and people's behaviours within this context drive energy usage, yet governments have formed separate departments of housing, energy and human services. This artificial segmentation of problem spaces reduces complexity, but also limits the degree to which any single organisation can understand and take action to

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address systemic challenges. This results in a complexity gap between problems such as climate change and the government's ability to address these challenges holistically.

The second strategy is *complexity absorption* whereby organisations create internal complexity that is determined to be equal or greater than the external complexity it faces. Complexity absorption leads to requisite variety which in the best case permits an organisation to be adaptive, opening up new kinds of strategic options (Hämäläinen, 2015). But there are risks too: resources can be quickly depleted as the organisation grows in size or diversity (Boisot and McKelvey, 2011) and possibly becomes too complex to be effectively managed (e.g. multinational financial institutions). In the public sector, complexity absorption results in the proliferation of new internal agencies within departments or ministries. For instance, the US Department of State has as many as 71 internal Offices and Bureaus, each with its own remit, leadership, resourcing, cultural norms and legacies. This leads to the remarkable cultural phenomenon that physical proximity to the Secretary of State's office is indicative of the importance, priority or power of a Bureau or Office, as opposed to a more fluid resourcing scheme based on global affairs. On a much smaller scale, the push toward data capture and analytics is also a form of complexity absorption, as public administrations deploy tools that can potentially help them understand their environment more holistically. However, the persistent challenge of big data is the ability to understand and take action on vast amounts of new information; complexity begets complexity.

Boisot and McKelvey describe these interrelated strategies of complexity reduction and complexity absorption, and the trade-offs inherent between them, as the *Ashby Space* (ibid.). Figure 2.1 illustrates this conceptual framework and the potential of design and other systems approaches to manage complexity. The diagonal line represents requisite variety, or an ideal state of dynamic equilibrium where the variety of an organisation's responses (internal complexity) matches the incoming stimuli (external complexity). According to Ashby, equilibrium can be achieved through forms of regulation (Ashby, 1956).

It follows then that *regulation* is the key task of organisations operating in complex environments. The objective of regulation is to move toward requisite variety as complexity increases. As Boisot and McKelvey point out, "the variety that the system then has to respond to depends in part on its internal schema development and transmission capacities and in part on the operation of tuneable filters, controlled by the system's cognitive apparatus, and used by the system to separate out regularities from noise" (Boisot and McKelvey, 2011: 284).

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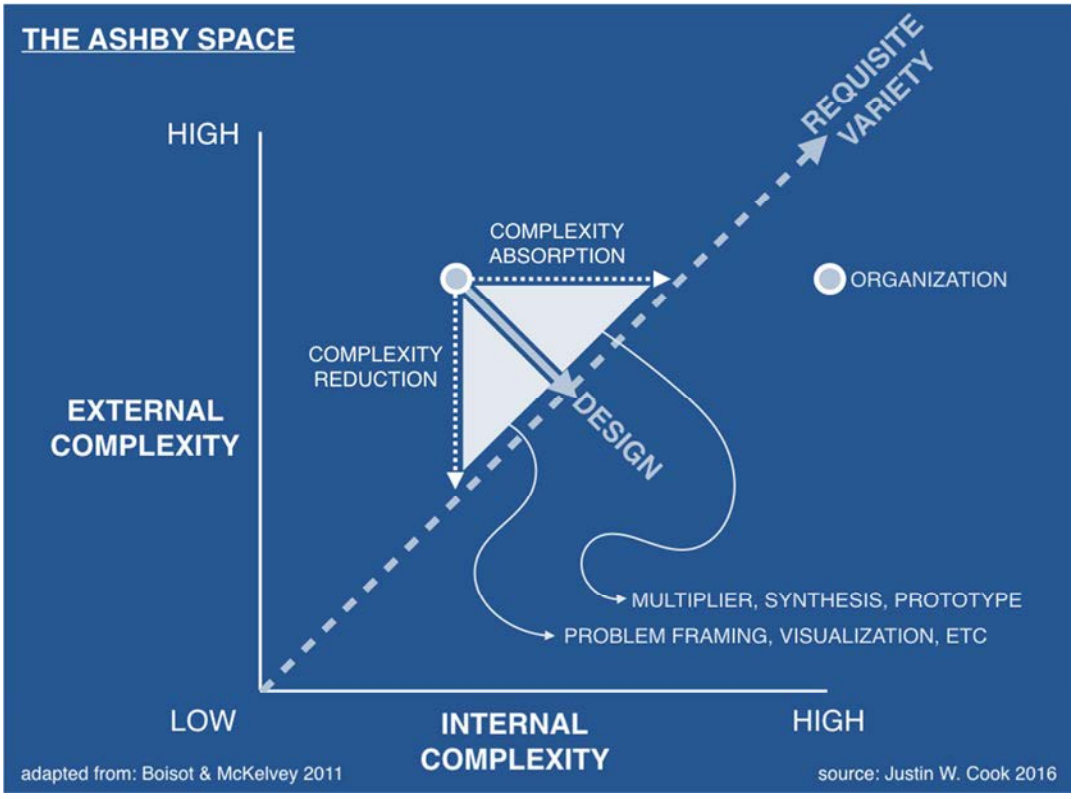
Figure 2.1. The Ashby Space



Source: Based on Boisot and McKelvey (2011).

The organisation depicted in Figure 2.2 is experiencing high levels of external complexity and facing a need for regulation to move it toward requisite variety (stability). As discussed above, there are two strategies to move toward stability within the Ashby Space: become more complex internally or reduce complexity by simplifying variety. An alternate complexity reduction strategy could be to retreat and focus only on core competencies, but this is unusual among most organisations not facing crisis and may be altogether impossible due to the interconnectedness of today's challenges.

However, a third strategy exists for working toward requisite variety that can achieve a more stable position than either complexity absorption or complexity reduction on their own. Design processes and some systems approaches are very effective tools for managing complexity and generating productive outcomes. Employing design principles and methodologies enables an organisation to transit the Ashby Space more efficiently toward requisite variety. The field's growing adoption across multiple sectors where normative tools are no longer achieving results is indicative of its success. While design methodologies still remain largely marginal to more firmly established strategy processes, a shift is underway that is pushing designers deep into organisations and making them part of the system itself. This is enabling designers to move beyond "innovation" teams responsible for novelty to participants engaged in implementation and, therefore, the evolution of the system itself. This shift provides designers with the opportunity to engage self-adaptive systems directly (Ito, 2016).

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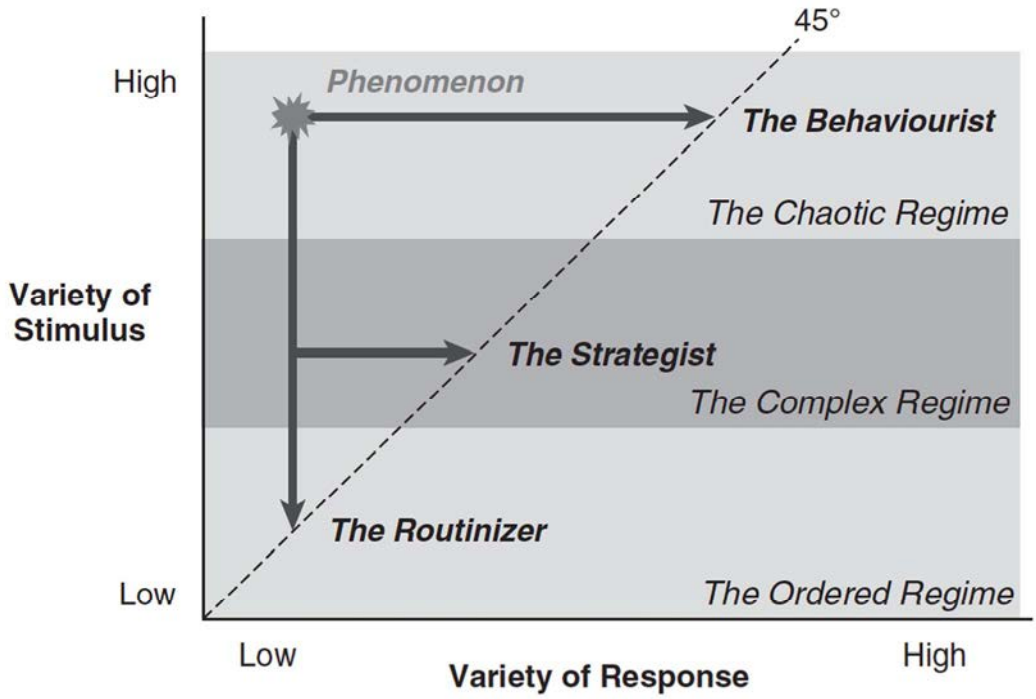
Design has traditionally worked to make sense of complexity through problem framing, visualisation, ethnographic practices, working with relative precision and across disciplinary cultures, and so on. These methodologies do not artificially simplify complexity, but aim to contextualise and order information and then make it actionable. Crucially, design processes that include implementation also create a feedback loop between information, ideas, people and action through prototyping and iteration. Rather than loading more complexity into the structure of an organisation (complexity absorption), design allows for variety to be explored and exploited (and thus reduced) *within the process itself*. By optimising reduction and absorption strategies, design and systems approaches transit the Ashby Space more productively towards requisite variety, enabling what Boisot and McKelvey term the *complex regime* (Figure 2.2), where complexity can be embraced and successful schema can be developed. The following sections explore in greater detail systems approaches and design methodologies that have proven effective within the Ashby Space.

Figure 2.2. Three complexity regimes



Source: Boisot and McKelvey (2011).

Returning to the question of systems change in crisis versus static conditions, what can be learned from the Ashby Space framework? In the face of crisis, organisations tend to adopt a complexity reduction strategy in order to make a situation manageable. This is understandable, and in some cases appropriate. However, experience shows that this approach carries significant risks associated with decisions that can worsen outcomes. For instance, in the aftermath of Hurricane Katrina, which devastated New Orleans in 2005, the Federal Emergency Management Agency (FEMA) supplied thousands of what came to be known as FEMA Trailers, mobile units intended to provide temporary housing. While this quick reaction provided housing relief for those who had lost their homes, many of the trailers contained dangerous levels of formaldehyde, which caused

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significant health issues. Worse still, as of 2015 – a decade after the crisis – people continue to occupy FEMA trailers (Smith, 2015), suggesting an inherent conflict or error in what was designed to be a short-term solution. However, alternative examples of progressive, productive reactions to crisis also exist. As Helsinki Design Lab explored in their 2013 case study *Rebuilding Constitución*, the response to the devastating tsunami that destroyed the city of Constitución, Chile, shows that a systemic, inclusive, co-created solution to redesigning and rebuilding an entire city can be done both efficiently and successfully (Boyer, Cook and Steinberg 2013: 25).

Under static conditions, both complexity absorption and complexity reduction can occur. Returning to the example of the US State Department, the proliferation of Bureaus and Offices suggests a high level of complexity absorption for an administrative body charged with managing global affairs for the US Government. However, just as departmentalisation of large segments of public sector problem spaces is a form of complexity reduction, the same holds true for the internal structure of a single department or ministry. When conditions are fairly static (e.g. the absence of a large-scale conflict such as the Second World War or the rise of polarising adversaries during the Cold War), organisations like the State Department find themselves attempting to both reduce and absorb complexity, which moves them no closer to requisite variety. The key question in a static condition is: How does an organisation create an opportunity to transit the Ashby space toward requisite variety when there is no external stimulus to force action?

Working with relative precision

For many in the public sector, the fiduciary responsibilities that come with public office require a conservative approach to risk: with authority comes responsibility. This responsibility can be realised either through strict regulations on policy design and implementation, or tacitly through behavioural norms within institutions. In most areas, precision and certainty of evidence are understood to be a fundamental precursor to decision making. This is especially true for domains such as health care and education where the public expect positive outcomes, not experimentation and risk of failure. While it is certain that governments use evidence in their decision making, it is unclear whether the evidence fully informs policy or whether decision makers are able to comprehend evidence due to time, expertise, complexity or other constraints. The capture, analysis and transmission of evidence can also be a very time-consuming process. Political cycles and research cycles operate by very different clock speeds. Policy problems, especially certain social or environmental challenges, can be resistant to the formulation of comparable data. Moreover, evidence itself can be politicised – accepted by some as science and derided by others as fiction. These factors lead to a conflicted state: on the one hand, evidence is necessary; on the other, evidence may not be useful in a decision-making process.[8]

Enter then, wicked problems. As discussed above, wicked problems are emergent, meaning that they result from the interaction of smaller subsystems. Typically, science and evidence creation are most effective and precise at the level of the subsystem. For instance, the cognitive development of children can be well explained by neuroscience and psychology, but it is difficult to understand how learning emerges from the confluence of social, cultural, economic, environmental and biological factors. The problem that should concern policy makers the most – in this example, learning – is out of reach of the more narrowly defined domains of scientific inquiry. While some have begun calling for a second-order science approach to policy making, much work must be

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done to develop the field before it can be widely applied (see Hodgson and Leicester, 2016).

So, what can be done when facing a problem with no "definitive definition"? For designers and systems thinkers, the answer lies in their ability to work with relative precision. To overcome barriers stemming from uncertainty, it is necessary to comparatively appraise knowledge about a wicked problem. In practice, this means treating qualitative and quantitative data with equal rigour and by actively searching for – or inventing bridges between – the two. This process usually requires intuition and testing. The former, while perhaps an uncomfortable topic for many disciplines because of its apparent lack of seriousness, is in actuality a critical skill honed by experience and central to many designers' practice. In the context of strategy, intuition requires full investment of time and thought, so as to acquire a sense about how things fit together (Boyer, Cook and Steinberg 2011: 37). The latter, testing, is also dependent on intuition to the extent that it requires experience to know how to test ideas efficiently and productively.

Visualisation is also an effective tool for working with relative precision. In its most common form, visualisation is a sketch. Sketching allows the rapid transposition of ideas to paper, recording concepts while still allowing for addition, subtraction and interpretation. Precision can be increased or decreased in several ways. For instance, Figure 2.3 shows a collection of Picasso's famous "Bull" lithographs. On the left, he begins with fully developed drawings based upon a visually accurate portrait of a bull. On the right are rapid sketches that distil the essence of the bull to a few lines. Each lithograph effectively communicates the idea of a bull, but some allow for more interpretation than others. This interpretative space serves a purpose when confronting wicked problems. It allows for differing perspectives to enter a representation of an idea or analysis without relying on narrative, which itself can become so complex and circular so as to be disabling. Sketches and other forms of visualisation also preserve ideas so that they may be easily returned to over the course of work. Words on the other hand, unless carefully recorded, can be fleeting and lost during the process. Narrative can be difficult to re-contextualise, as anyone who has thought, "that seemed like such a good idea at the time" can attest.

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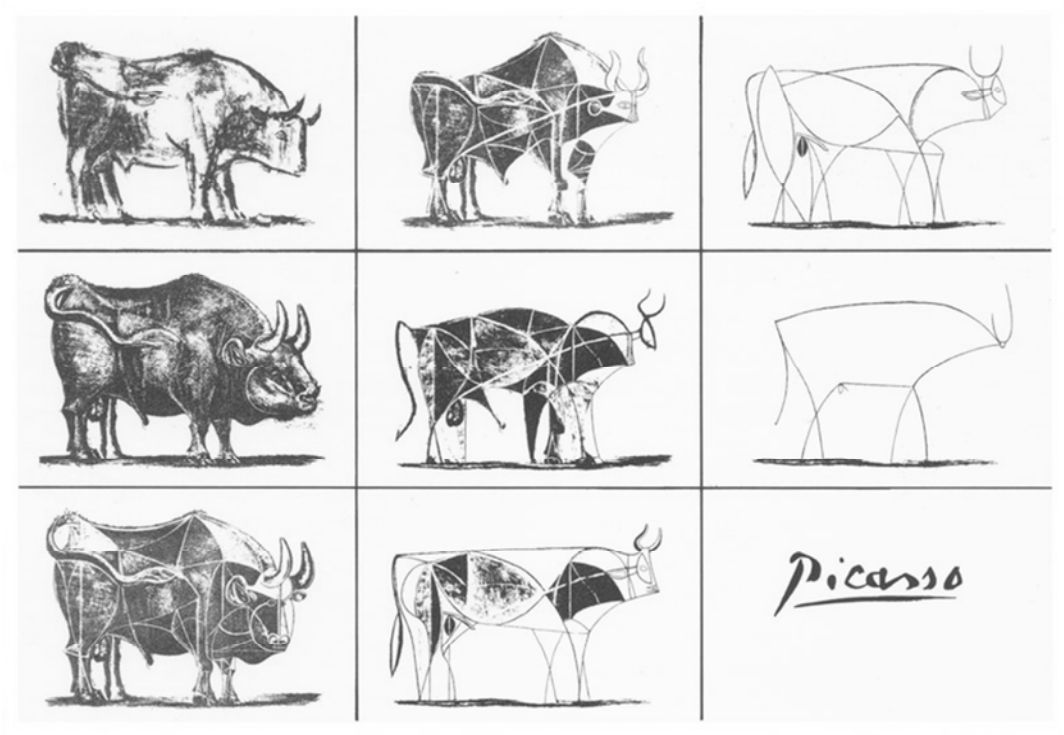
Figure 2.3. Picasso's "Bull" lithographs, 1945



Source: Picasso www.flickr.com/photos/sorarium/8578925321.

Working with relative precision also allows designers to propose solutions before all the facts are known. This pre-factual process is familiar to the practice of architecture, where designs for whole or parts of buildings, landscapes, infrastructures and so on are proposed well in advance of having fundamental information such as budget, location, occupancy and other constraints. In other disciplines, such as engineering, it is critical to have the most complete information possible before developing a solution in order to manage the risk of failure. This approach is productive when variables are known, but virtually impossible when working with wicked problems.

A pre-factual process enables an *open-ended solution* to be developed yielding at least two principal benefits. First, developing a solution early in the process creates a test case based in part on the unique problem being tackled rather than a generic theory. From this early prototype, greater understanding of the problem itself may be assembled. Second, because a solution was developed early and with the expectation that it will change, it can evolve radically as more information is gathered. Ideally, this results in solutions that are more robust and better tailored to their specific context.

Toward a systems transformation process

This section outlines a systems transformation process and draws on the authors' experience and case study research. Each subsection outlines in general terms the key elements of success. Greater specificity is highly dependent on the context, institutional capacity, problem, timeframe and resources available to public administrations as they embark on systems change. As discussed above, each wicked problem is essentially

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Chapter 1.

Systems approaches in the public sector: From theory to practice

This chapter discusses how systems approaches can deliver value to governments. It starts by discussing why systems approaches are needed in the public sector and why they have not so far been disseminated throughout the sector. The rate of change is continuously increasing and policy makers are confronted with various complex and wicked problems. Systems approaches can be very useful for addressing these problems. Applying a systemic lens to complex problems can help map the dynamics of the surrounding system, explore the ways in which the relationships between system components affect its functioning, and ascertain which interventions can lead to better results. Systems approaches help to demonstrate how systems are structured and how they operate. However, it is not easy to transform public systems. This chapter highlights the main challenges for systems approaches within the public sector: why it is difficult to act under uncertainty, learn from systems adjustments, turn systems off and account for the speed of change in the public sector. The chapter concludes with an overview of the emerging systems thinking practice in the public sector, and explores the question of how systemic approaches have been applied to the transformation of public service delivery.

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Introduction

Today, complexity and uncertainty are the norm – they are *contexts*, not just risks. The world seems to operate by a new set of rules are difficult to observe directly. The defence and intelligence communities refer to this state as "VUCA", a reference to the Volatility, Uncertainty, Complexity and Ambiguity characterising geopolitics after the end of the Cold War period. Today, technology, decentralisation, the rise of non-state actors and other factors have accelerated the rise of VUCA in every domain. Labour markets and financial systems are more and more interconnected, making it increasingly difficult to identify the causes and effects of complex problems. For example, a transformative referendum on Brexit seemed unlikely even three years ago; and its cumulative impact on both the United Kingdom and Europe (and indeed the rest of the world) is all but impossible to predict, but will certainly be profound. The public sector as a whole is contending with VUCA, even if administrations do not understand how, where or why.

One key concern is *how best to account for uncertainty while managing greater complexity and still deliver effective services.* To a degree, the answer lies in a policy-making approach that leads to robust systems and adaptive structures. The effectiveness of the decisions made will depend on how completely the problem and its context are understood and how well the dynamic relationship between interventions and context is tolerated. This requires a new mind-set – one that acknowledges uncertainty as part of everyday decision making and encourages working in iterative ways. It also requires an understanding that path dependency[1] exists in all public sector institutions and policy interventions, which may not serve them well, or worse, may lead to predictable outcomes.

Changing the dynamics of a well-established and complicated administrative system is not easy. A new and necessarily complex process of seeing, understanding and deciding is fundamentally challenging our institutions. It has the makings – the foundational conditions – of a *governance crisis*. 19th-century institutions are currently being outmoded by 21st-century problems stemming from interconnectivity, cyber threats, climate change, changing demographic profiles and migration. Public policy makers have traditionally dealt with social problems through discrete interventions layered on top of one another. However, such interventions may shift consequences from one part of the system to another or continually address symptoms while ignoring causes. Recognition of the *complexity gap* (the disconnect between institutional capacity and the problems they face) has therefore led to growing interest in systems thinking and other systems approaches such as design thinking.

Design, systems engineering, systems innovation, systems thinking and design thinking have interlinked philosophical foundations and share, in some cases, methodologies.[2] For this analysis, the umbrella phrase *systems approaches* is used to describe a set of processes, methods and practices that aim to affect systemic change. Using systems approaches in public service delivery can prove challenging due to siloed structures and narrow remits, but can also effect change here too. Public interventions need to move beyond a narrow input-output line of relationships. Of course, the ease or difficulty with which public service delivery systems can be changed depends on the maturity of the system, however new developments are already on the way. These include novel urban transportation systems, e-healthcare systems, learning ecosystems and so on. OECD has drawn attention to this topic in its *Systems Innovation: Synthesis Report* (2015), which discussed public sector challenges through a systems innovation lens.

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While the 2015 report relied on specific systems approaches – systems dynamics and socio-technical systems often used in sustainability analyses to explore the role of systems thinking in innovation policy – this report focuses on the ways that public policy makers can use a multitude of systems approaches across different policy areas. OECD (Burns, T. and F. Köster (eds.), 2016; Burns, T., F. Köster and M. Fuster, 2016) has also analysed complexity in the education system with a focus on the importance of different types of learning/building capacity, stakeholder involvement, a "whole of system" vision and trust. Specifically, these publications drew attention to systemic weaknesses in capacity that contribute to today's governance challenges.

System thinking has a long history, but is far from an established field. There are no systematic overviews on the use of systems approaches in the public sector, and the process used in practice is not formalised. Furthermore, little empirical research has been done on the strategies policy makers use to deal with uncertainty in practice. The initial research for this report found only a few well-documented cases of systems approaches in the public sector. The small number may indicate that governments in-source systems capabilities and, thus, tend to rely heavily on outside consultants and designers to lead and instigate systems level changes. Only in recent years has there been renewed interest in applying system approaches, such as design, more rigorously in the public sector.

This report looks at how systems approaches can be used when dealing with complex problems in the public sector. It explores whether, when and why system approaches can deliver value to governments (Chapter 1) and identifies the key principles and tactics involved (Chapter 2). The report aims to provide a platform for discussion to enable decision makers and public services managers to consider the kinds of challenges they face, the resources available to them and what they can expect while engaging in a rigorous problem-solving process using systems approaches. It must be emphasised that no one-size-fits-all solution or systems methodology exists for complex challenges. Solutions – or, more accurately, interventions – and methodologies are highly contextually dependent. The case studies in Chapter 3 shed light on the types of specific preconditions that have enabled some public sector actors to engage with systems approaches.

This report aims to address the following questions: How can I evaluate my own system to see if we require a systems approach? What are the necessary conditions? What variables should be considered when developing a systems approach? As indicated above, there are no simple answers to these questions because each situation is different. However, the following conditions indicate a need for systems approach:

- An "innovation" agenda has taken root in government or a department.
- The inclusion of citizens in decision making has become a priority.
- Citizen orientation is overtaking an institutional orientation.
- There is trust (or demand) in government for experimentation.
- Problems are no longer solved by traditional means (i.e. the line between external stakeholder and government must be blurred to achieve impact).

Important variables include: having a champion committed to change, capacity to experiment, the ability to engage with internal and external stakeholders, and sufficient resources to delay business as usual (time, capital, etc.).

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The report examines the use of systems approaches work in two very different contexts typical for governments: first, *a static condition of near paralysis* or a predominantly administrative mode managing well-defined objectives where a change mandate does not exist; and second, *a crisis event* where a change mandate exists, but an understanding of the architecture of the resultant challenge may be fleeting and a transformation process may be unclear. The report encourages the public sector to acknowledge that systems change is necessary and possible in nearly every domain. But, in both static and crisis conditions, administrations need to move away from a procurement-driven policy of using external consultants and contractors to occasionally employ systems approaches, towards allocating resources to make systems approaches an integral part of the public organisations' everyday practice.

Managing complexity in the public sector: The case for systems approaches

Governments have spent decades perfecting systems that can successfully manage *complicated* problems (e.g. banking regulation, trade treaties and healthcare systems), but now find themselves immersed in a world of *complex* problems. A complicated problem is one that is ultimately predictable with sufficient analysis and modelling. Such problems are linear with an identifiable beginning, middle and end; and while they may have many parts it is possible to understand how these collectively create a whole. Management systems such as Six Sigma[3] have demonstrated their value as tools to tackle complicated problems (Kamensky, 2011). Complex problems, on the other hand, are inherently unpredictable. They are frequently referred to as *wicked* or *messy* because it is difficult to assess the true nature of the problem and therefore how to manage it (see Box 1.1). Rather than having discrete parts bound together in linear relationships, complex problems are emergent: they are greater than the sum of their parts.

Box 1.1. Characteristics of wicked problems

The idea of wicked problems emerged in the 1970s from systems theory, and is based on the understanding that problems cannot be understood and addressed in isolation (Head and Alford, 2015; Rittel and Webber, 1973). Wicked problems have many characteristics, but their principal challenge to governments stems from the fact that they cannot be solved by partial or transactional solutions, but instead require concerted, adaptive and carefully stewarded approaches. While there may be different classes of wicked problems (e.g. those arising from path dependencies, incumbent interests and structural lock-ins or accelerated change), each problem has unique traits that stem from its context, history, stakeholders and so on.

The key aspects of wicked problems include the following:

- There are multiple stakeholders, each acting to a certain extent within their own norms.
- Complete diagnosis or understanding is not possible. "There are no definitive definitions" (Hämäläinen, 2015a: 33) because each perspective from which the problem is viewed provides a different understanding of its nature.
- There are no optimum solutions to wicked problems. Nevertheless, long-term options are often discounted in favour of short-term agreements.
- Liminality is inherent in analysis of and intervention in wicked problems. "Liminality" denotes a condition that is "betwixt and between the original positions arrayed by law, custom, convention and ceremony" (Turner, 1977: 95). It refers to a space where regular routines are suspended.
- Because wicked problems are impossible to observe directly, they are unpredictable and their behaviour is uncertain.

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Box 1.1. Characteristics of wicked problems *(continued)*

- The efficacy of solutions is difficult to determine because of knock-on effects, self-adaptation and inherent complexity. Attempts have been made with randomised control trials (RCTs) and other evidence-based instruments, but these are fundamentally challenged by the fact that they must be artificially bounded in order to manage complexity and make them feasible (Hämäläinen, 2015b).

Each characteristic on its own would pose significant challenges to traditional governance approaches. But when taken together, they form a disarmingly complex set of obstacles – so much so, that the standard approach for rigid institutions and bureaucracies is to avoid big problems in favour of achievable solutions to proximal issues. Wicked problems require coordinated action on the part of stakeholders (both public and private), adaptability, long-term planning, sustained commitment and active management among other actions. In some cases, these actions are antithetical to administrations, who by design have limited their instruments to work in a linear, unidirectional relationship between problem and solution. However, in an interconnected world where system boundaries are difficult to define, it may no longer be possible to treat any problem as discrete.

Traditional management tools have limited capabilities when applied to complex problems. For the sake of expediency, manageability and clarity, traditional approaches simplify complex problems into what are considered to be their constituent parts and manage them through discrete interventions, layered one on top of another. However, approaches that look at actors and interventions in isolation or disconnected from past efforts may fail to capture and address complex policy legacies. Qualitative case studies have been used to analyse complex problems, as they can treat quantitative and qualitative data comparatively in a narrative structure. However, case studies or more sophisticated methods, such as agent-based simulations, tend to be specific to the problem and context being analysed, and therefore provide little guidance for decision makers seeking to take broader action (ibid.).

As wicked problems continue to multiply, the digital revolution is delivering more power and voice to individual citizens than ever before. Citizens increasingly expect more personalised services that focus on individual needs, while countries now have diverse populations that call for tailor-made approaches. For example, the requirements of elderly care for migrant populations can be vastly different from standard care services.[4] Consequently, standardised, large-scale public service solutions delivered via command and control administrative systems[5] no longer function, forcing government to rethink service delivery boundaries and to design solutions that take into account a broader set of actors and their relationships.

As a result, stakeholder maps have been redrawn. Citizens are now located at or near the centre, not as a contingency but by necessity. Processes that are unable to contend with or adapt to citizen participation will need to be fundamentally reworked (e.g. the Food Standards Agency in the UK reworked its food safety supervisory model based on consumer reports) (OECD, 2016). Public services that are not meaningful or relevant to citizens may struggle to build coalitions of support.

Policy makers must also contend with complex policy legacies. Traditionally reductionist approaches applied to social systems have proven limited in their ability to take into account complex social problems and their web of legacies.

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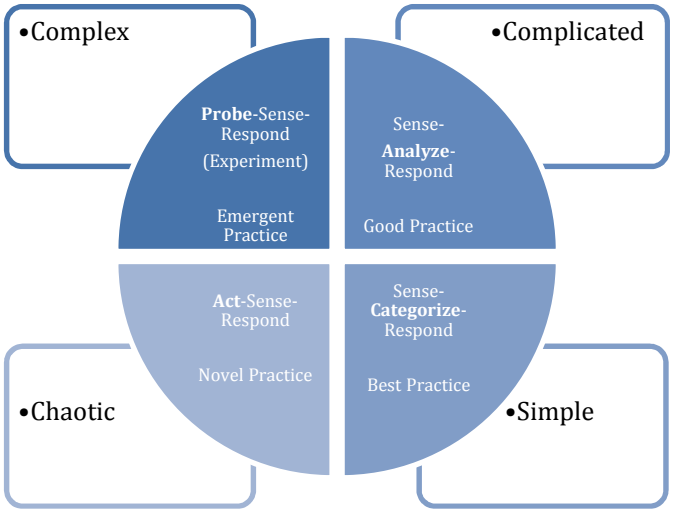
Policy problems have evolved into systemic, interdependent challenges, and their understanding and analysis needs to change accordingly. In highly complex problems, the relationships between cause and effect are neither linear nor simplistic. For example, it might be hard to establish whether reduced waste is a result of improved industrial packaging, changing consumer habits or stricter controls. In this context of boundless complexity, solutions can have serious unintended consequences. For example, the construction of a simple road overpass in Somerville, Massachusetts – which was much needed from an infrastructure development perspective – led to a rise in childhood obesity rates due to part of the community being cut off from leisure and sporting facilities (Curtatone and Esposito, 2014). In complex contexts, cause and effect may only be obvious in hindsight, highlighting the need for different analytical tools.

The Cynefin Framework, developed in the early 2000s by IBM for decision makers, identifies four different contexts: simple, chaotic, complex and complicated (Figure 1.1). In a complicated system there is at least one right answer, as it is possible to identify casual relationships, even if these are not initially visible. However, a complex system is in constant flux. The framework shows that different analytical methods need to be employed to address different policy situations. At the same time, systems in reality are increasingly complex – and not just complicated – and, in expert-driven domains, the mental bias produced by knowing what the right answers should be (seeing systems as complicated and not complex) can produce adverse effects. This means that it is important to understand policy systems better in a public sector context and not overestimate the available knowledge in an increasingly complex world.

Figure 1.1. The Cynefin Framework



Source: Based on Snowden and Boone (2007).

In essence, systems consist of elements joined together by dynamics that produce an effect, create a whole or influence other elements and systems (see Box 1.2). Systems exist on a spectrum of comprehensibility from the easily observed and analysed (e.g. the food chain) to those that are highly complex or novel requiring postulation (e.g. global climate systems). Systems share some common features: they are usually self-organising meaning that system dynamics grow out of a system's internal structures, they are connected and their parts affect each other, and they are constantly changing and

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adjusting. They can also be counterintuitive meaning that cause and effect may be distant in time and space. They are governed by feedback and are path-dependent, resistant to change and characterised by non-linear relationships.[6]

Box 1.2. Defining systems

The application of systems approaches depends significantly on how systems are defined (i.e. which relationships are considered important). There are many ways to define systems – geographical proximity (local, regional, national and international), production or markets (e.g. a sectoral system including all upstream and downstream producers and the characteristics of the markets they serve) or technological affinity (technological systems). OECD (2015: 18) has defined systems as "the set of stakeholders who have to interact so that the system as a whole fulfils a specific function (or purpose)". However, this definition may be somewhat misleading, as public policy systems include not only stakeholders, but also regulations, organisational routines, cultural norms and so on. As public policy systems are generally outcome oriented, the present report applies the purposeful systems definition produced by Ackoff and Emery (1972), where the system is bounded and created to achieve its goal(s) and its purpose. Hence, elements of the system are operationalised based on their connection to the goal of the system.

Systems approaches have developed over the last 75 years (see Figure 1.2). Increasing computing power is providing a growing number of tools to trace and visualise causal relationships and simulate complex problems (from causal loop diagrams, stock flows to dynamic simulations, group and mediated modelling). However, modelling comes with a cost: predefined assumptions simplify complex problems and can lead to incorrect assumptions. Qualitative systems approaches have also emerged (soft systems modelling) that concentrate more on identifying the objectives of the system, rather than modelling the system backwards from the predefined goal. Both broad approaches have benefits that can be applied in different policy situations (either as a sense-making tool in a situation where there is an over-abundance of data or to gain insight into decision-making and planning processes). In practice, most systems approaches use a multitude of methods and the origins of the respective approaches are often no longer distinguishable (a more detailed discussion of the theoretical background and limitations of systems thinking can be found in Annex 2).

Applying a systemic lens to complex problems can help map the dynamics of the surrounding system, explore the ways in which the relationships between system components affect its functioning, and ascertain which interventions can lead to better results. Systems thinking helps to demonstrate how systems are structured and how they operate. This requires an understanding of what lies between the different parts, their relationships and the gaps between the knowns. It also means reflecting on how best to use this knowledge to take action (i.e. design and design thinking) by devising proposals to be tested and implemented as system interventions.

A PowerPoint diagram illustrating the US military strategy in Afghanistan from 2009 (Figure 1.3) underscores the fact that visualisation of the system alone does not increase understanding of what needs to be changed in practice. It also emphasises the point that design thinking can help to move from visualising systems to actionable knowledge that allows public managers to make decisions.

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Figure 1.2. Development of systems thinking: towards methodological pluralism

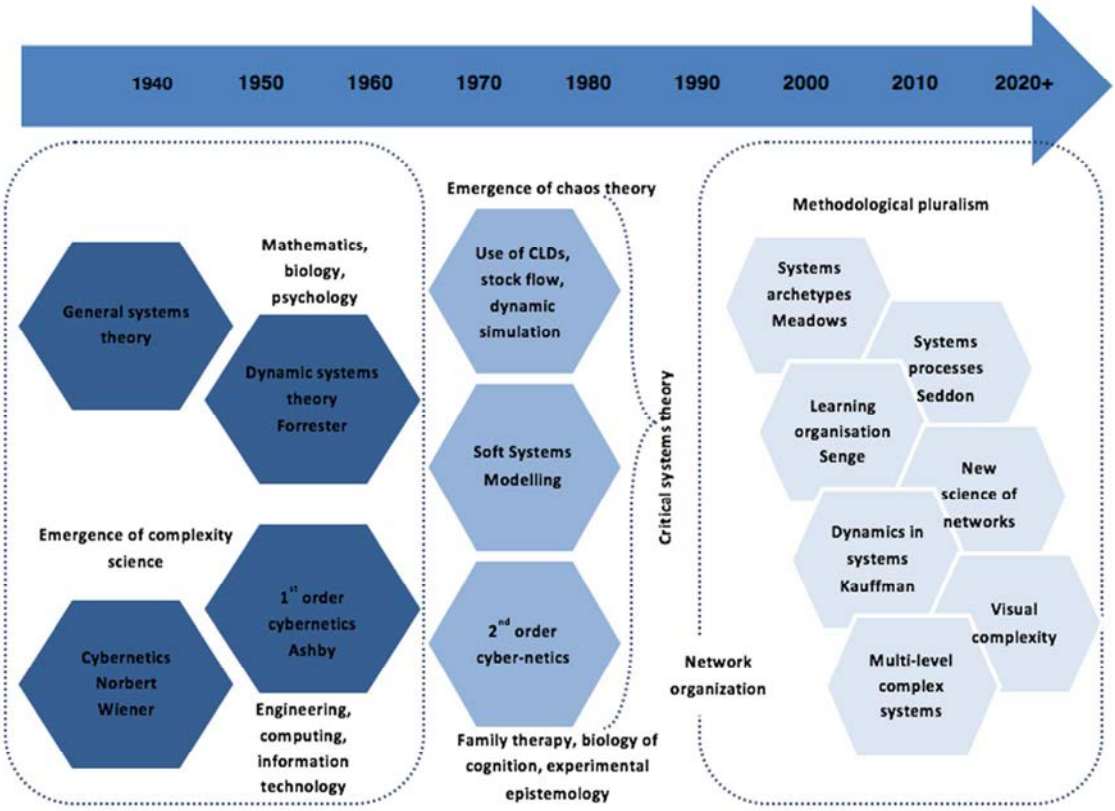
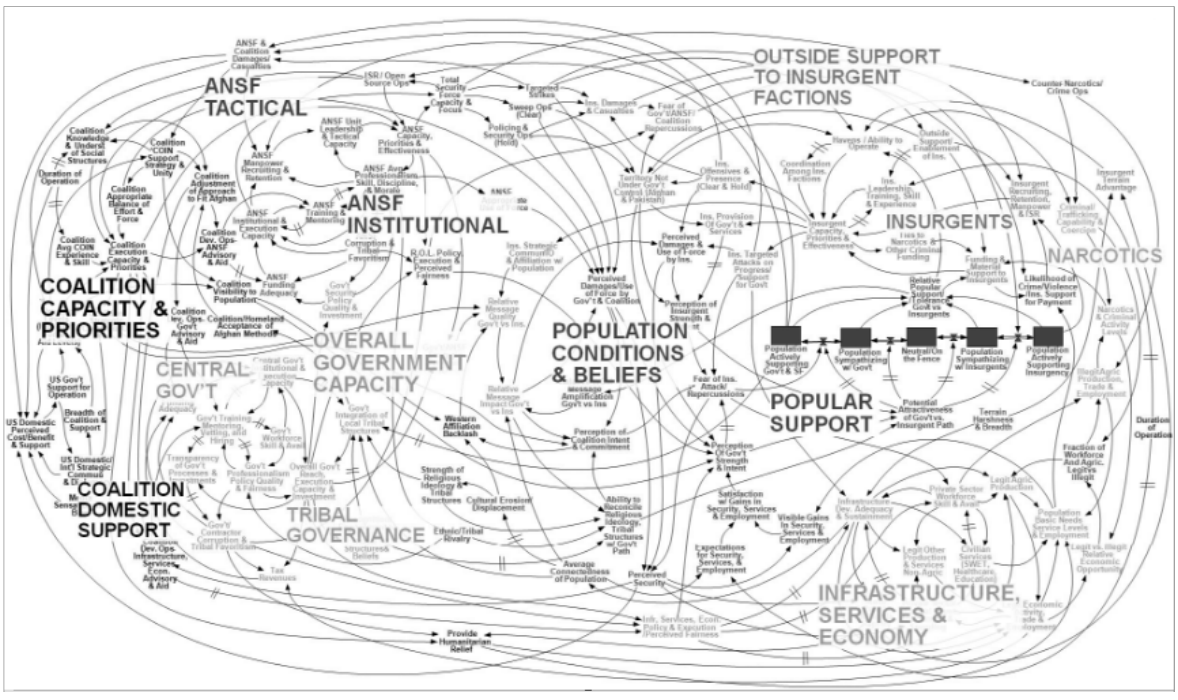


Figure 1.3. Complexity of the American strategy in Afghanistan



Source: PA Consulting Group, reproduced in Bumiller (2010).

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While it is tempting to assume that front-line public services and administrations are distant from or not implicated in large-scale complex problems – let alone wicked problems – careful observation suggests otherwise. For example, responding to the challenge of an aging population requires interventions at the system level to balance social transfer reform and the transformation of service delivery in line with the needs of senior populations (Box 1.3).

Box 1.3. The case for system approaches: Ageing populations

Aging populations are a rich territory for systems approaches. Senior housing, ongoing medical care, nutrition, socialisation and wellbeing services, lifelong learning, mobility and independence are all challenges that benefit from systems approaches, because they sit at the intersection of multiple professional fields, governmental agencies and human needs.

Aging populations in countries like Finland and Japan present a significant challenge for the provision of public services. The pension systems that have guaranteed benefits for decades were designed at a time of an inverted population pyramid, as compared to today. Financial fixes that fall under the clear remit of social service administrations have delayed the failure of pensions, but their future is uncertain as dependency ratios continue to increase in both countries. Tinkering at the system's edges with pension reform, in addition to squeezing additional efficiency out of social services with technology and better management, may continue to preserve the system for some time. However, large-scale systems transformation will be required to prevent the collapse of public budgets. Societies will need to redesign institutions and other structures to meet the demands of a majority senior population. This represents a significant departure from the current state of things which favours the young and economically productive.

This transformation cannot occur overnight. Governments will need to set the stage by working at a systems level to introduce interventions aimed at producing a new societal model that is inclusive of seniors. In other words, a problem that is typically managed at the level of public service delivery now requires administrations to work to transform large-scale systems, in order to avoid further governance crises.

For example, the Centre for Ageing Better (Ageing Better) in the United Kingdom is an independent charitable foundation set up in 2015 to create "a society where everyone can enjoy a good later life" (Centre for Ageing Better, 2017). As one of the UK's What Works Centres, it drives better decision making by generating, sharing and using evidence. Its approach to change is to deliver a whole-system, societal level response to an ageing population. Ageing Better develops, synthesises and applies evidence of what works to enable a good later life, and utilises systems and design thinking to develop and test innovative solutions. The organisation uses its independence to influence both national and local decision makers by communicating information regarding needed changes and working alongside implementation partners to improve later life. Examples of current areas of work include a collaboration with Public Health England to increase awareness and uptake of strength and balance activity, and a partnership with the Greater Manchester Combined Authority to realise their commitment to becoming an age-friendly city region. Ageing Better is currently delivering a programme of insight and co-design work across five localities in Greater Manchester. This work will develop local, regional and national-level interventions to reform the employment support system to better meet the needs of individuals aged over 50 who are unemployed or in low-paid work.

The aging population is not the only domain where system approaches can be applied. Systems approaches can help solve a variety of other public service problems:

- *Mobility*, in general, is a very appropriate field for systems thinking and design, not least because the complex, interdependent systems manifest in physical ways (e.g. in interconnected highway and road networks), but also because the

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landscape of mobility is shifting away from a need for large-scale infrastructure towards smaller individual or medium-scale solutions that go the "last mile". These represent more complicated problem sets because they are fractal in nature and must correspond very closely with the needs of individual users and their contexts. For example, the City of Warsaw in Poland is developing an urban information system based on micro-transmitters in smartphones for the visually impaired. The system allows smartphone owners to receive written or verbal information, for example, on the location of bus stops, the numbers of arriving trams or the location of a museum entrance (OECD, 2016).

- *Education* is also appropriate for systems approaches due to its contextual variance. Nearly every transaction in education is unique, and the objectives of each participant in the transaction are also unique (e.g. school leader with teacher, teacher with student, student with parent). This makes the system especially resistant to scaling solutions, or those that attempt to apply the same logic to every scenario. Education systems also have compounding and contradictory objectives, such as the inculcation of shared identity versus agency and independence for students. Systems approaches help to navigate this space where the optimal is often impossible.
- *The machinery of government* (i.e. changing the organisational behaviour of agencies) is another space where systems approaches can achieve desired impacts. Design represents a way to organise processes, and bureaucracies, in particular, are repetitive processes. Systems approaches, including design, can function as a neutral broker/arbiter to evaluate processed and work to optimise or, even better, redesign them to enhance their transformative capability.
- *Policing, human services, environmental protection, planning, housing, waste and energy* are all domains in which systems approaches have shown an emerging efficacy. The common denominator is that these services directly interface with the needs and lives of citizens whose expectations and realities have changed under the weight of technological, economic and global change. Societal models formed from institutions, civic practices and expectations, among myriad other factors that served these constituents, are largely outmoded and must be renewed.

Interconnectivity, wicked problems and empowered citizens are all driving governments to change the way in which they work. The systemic nature of today's challenges makes this task much more complex than the government reforms of previous generations. Linear, rigid processes will still have a role in public administration, but the number of transactional processes that these manage will continue to decline. To address the vastly more complex problem sets of this century, systems approaches will have to supplant traditional capabilities. The alternative is waning relevance and a crisis of governance, as citizens look to alternative means to improve their lives.

Challenges of using systems approaches in the public sector

This section explores the following core challenges of using systems approaches in the public sector:

- Balancing the need for evidence with taking action.
- Creating room for open-ended processes and synergistic feedback.

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- Changing a system that cannot be turned off, redesigned and restarted because of the need for continuous service provision (e.g. healthcare, education).
- Working amid rapidly changing conditions.

Use of information in highly complex environments: evidence versus action

In the past, decision makers benefited from two forms of complexity reduction: first, a lack of interest, necessity or ability to forecast externalities; and second, simplified classification of information into abstractions or well-delineated silos. This made diagnosis of problems much easier. The availability of less information, especially contradictory information, enabled decision making to proceed unencumbered by uncertainty or complexity.

Today, collecting "enough" data – when full diagnosis of a problem may be too resource intensive or even impossible – is a significant challenge. Sufficiency of information could forever be out of reach. In this context, how do teams proceed with confidence? When working on problems related to broader systems or wicked problems, there is often no definitive answer.

Nevertheless, the wave of evidence-based policy making seems to assume that policy makers are able to wait until a sufficient amount of data is available before acting (Head, 2010: 13). This does not correspond with everyday policy practice, where reforms and "decisive" action are undertaken on a daily basis. This means that, in many cases, policy makers are concentrating on tangible, specific aspects of the puzzle rather than approaching complex problems with a comprehensive, holistic lens. It is indeed unrealistic to hope that every decision in the public sector will be based on robust evidence; however, the associated danger has to be acknowledged as well, as it is difficult to change practices that become commonplace following fast-track decision making.

Conversely, evidence-based methods or rational diagnosis to policy making tend to emphasise positivism and, thus, may become overly technocratic, overlooking the fact that many competing policy solutions are ideological and value based (Stanhope and Dunn, 2011). Thus, information is used not only to diagnose problems, but also to legitimise value-based decisions.

To decrease uncertainty in public sector environments, a variety of methods (e.g. scenario planning, horizon scanning, integrated thinking, etc.) have been used. Nevertheless, uncertainty cannot be reduced in its entirety. Furthermore, governments have become exceedingly dependent on externally produced knowledge; and, yet, there are unavoidable limits to the relevance and usability of knowledge (Mulgan, 2005). In cases where there is an overabundance of information, it may be more important to know which knowledge is not needed for decision making, rather than having information (Feldman and March, 1981: 176).

Learning and adjusting the system: The feedback loop dilemma

Feedback is the core principle in cybernetics: correcting system errors is only possible when systems are capable of obtaining information about the effectiveness of their actions. A feedback loop provides information about the functioning of the systems and may later result in a change in the policy intervention or its effects. Feedback reinforces existing information acquired by the organisation and guides future learning processes both at the individual and organisational levels. Thus, feedback is essential to learning, and most systems approaches talk about single and double-loop learning or even triple-

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loop learning (Agryris and Schön, 1978; Flood and Romm, 1996). The former describes learning connected directly towards the policy at hand, while the latter refers to a process of reflecting that enables change in the broader management component behind the policy intervention. Another, broader, form of learning is "deutero learning" (learning about learning), which denotes the institutional capacity of organisations to learn (ibid.).

Feedback loops that lead to meaningful insights – and thus, learning – can only be created with open-ended processes. These imply that the system is receptive to alternative ways of doing things, alternative opinions, and has a tolerance for risks and risk-taking (see more in Van Acker and Bouckaert, 2015). Both organisational and individual factors influence these processes. For example, the work of the UK Cross-Government Trial Advice Panel, which supports experimental design in order to understand whether programmes and policies are effective, reflects this need to create feedback loops.

However, such open-ended feedback loops have become more difficult to implement in the public sector, due to the "purchaser-provider split" in public service delivery that emerged with agencification[7] in the public sector and the prevalence of traditional procurement procedures. Procurement practices in the public sector, in general, limit open-ended processes, which also makes the use of iterative, agile methodologies very difficult.[8] There are, however, efforts to counter this: for example, the federal government in the United States has developed a marketplace for agile service delivery by making companies prove their skills with working prototypes on open data, rather than providing lengthy overviews of their qualifications. This minimises "bid and proposal" high-quality vendors, but also diminishes the risks of government entering into open-ended development processes.[9] In many cases, these practices cut the feedback loop to the policy maker and substitute the former with increased accountability. Simple input-output metrics are used as success measures, although these measurement systems assume that accountability equals performance (Kelly, 2005). One drawback is that linear accountability frameworks only work well in predictable environments (Head, 2010: 14).

Static measurement systems that are supposed to supply feedback to dynamic processes in the public sector tend not to work.[10] Most evaluation systems in the public sector do not account for long lead times or complex feedback loops permeating processes surrounding wicked problems. In these cases, where measurement is difficult, feedback starts to depend on stakeholders and their value-based judgements. Consequently, feedback related to complex issues needs to also incorporate the dynamic nature of processes – continually "learning by doing" – as well as systems knowledge and the ability to place value-based information into context. This is essential in order to quickly address ripple effects in the system and unintended consequences – such as recognising that building a road overpass has had a serious effect on children's health (Curtatone and Esposito, 2014).

Turning a system off

New systems models can be designed in the abstract, but ultimately need to be built within existing systems. This is because large-scale systems providing services such as education or healthcare cannot be turned off, redesigned and restarted as a company might shut down an underperforming vehicle plant to replace outdated equipment. This problem recalls March's (1991) dilemma of exploring and exploiting: how to introduce systemic change while at the same time providing services described by laws and regulations (see also the discussion in Lember, Kattel and Tõnurist, 2016).

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Most public services must be continuously available. For public sector innovators this makes for a particularly perplexing class of problem. Inherent complexity and interconnectedness form part of the state's basic function, which means that the shape of such public services must be preserved. While Buckminster Fuller's instruction to "build a new model that makes the existing model obsolete" is empowering, many public services cannot be made obsolete in the face of this kind of "wicked" problem. They can and should be renewed, but their core function must remain constant. This structural dilemma requires a non-standard approach, because any intervention aimed at transformation must be at once sympathetic *and* disruptive to the old system; incrementalism must be married to a whole systems framework.

Take education, for example – perhaps the most reform-intensive domain in the public sector portfolio. Nearly every corner of most education systems is targeted for reform, yet little systematic improvement is being realised. Why? How can the United States, for example, spend on average USD 600 billion per year on public education and nearly the same sum on reform of that system, and still see student performance stagnant or declining?

There are at least two reasons for education's resistance to large-scale change beyond the fundamental issue of its character as an enterprise highly determined by its multivalent context (location, parents, teachers, students, curriculum, etc.). First, the system cannot be turned off and rebuilt. Every day, students show up in classrooms with real demands for learning and, increasingly, emergent needs for additional social services. Their needs must be met. Moreover, most students and parents are unwilling to be a test case for reform. Change must happen in an incremental, step-wise fashion that gives administrators and other stakeholders' confidence that the effort will lead to improvement. In Finland, for instance, the national curriculum is renewed on a ten-year cycle and, in the last round (2016), was organised to include the opinions of as many stakeholders as possible. While Finland's curriculum is the product of an exemplary education policy and development process, it is also the product of a system that is continuously operative and resistant to change. A decade-long multi-stakeholder process would seem glacial compared to systems change in the tech sector, for example. Second, authority in most education systems is largely concentrated in central offices and other administrative bodies. In most cases, the system is designed around the people that run the system itself, rather than the "clients" (i.e. students). This means that those who are responsible for maintenance and continuity of the system must also manage its reform and foster innovative new practices. However, their interests tend to run contrary to their own needs. Debate about education's purpose and shape in the future is unusual if not altogether absent in this administrative format. Without a clear idea about what the future should be and why, it is difficult to organise reform efforts around common goals. In other words, change cannot be systemic; it is always piecemeal and therefore unable to achieve the synergistic effects promised and demonstrated by systems approaches. Attempts are being made at rendering the "existing model obsolete", such as with the charter school movement in the United States, but these remain marginal and have not achieved the promised transfer of innovation to traditional education settings.

Designers and systems thinkers, and those responsible for improving public services, should ask themselves critical questions about how to keep core services running while reforming the underlying system. They should work to uncover what is working well in a system and should be preserved and, similarly, what rigidities and frictions exist that work against change, but are important to preserving the public interest. Furthermore, it is important to know whether it is possible to work within the system to achieve reform or

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whether it is necessary to approach change from the outside as well. Transformative change may also require the spark of a crisis in order to significantly redesign an entrenched system.

All of this, of course, takes time and is akin to changing the tyres while driving a car. In government, time is a scarce resource principally because of the instability caused by political life cycles. This perennial challenge cannot be fully addressed here, but suffice it to say that a widely shared vision for the future of a system born out of a co-creative process – as opposed to a set of administrative priorities – will go a long way to providing a durable platform for systems change.

Speed of change

Established institutions promote their own stability; they are by-and-large path-dependent and can be highly resistant to change. Any ministry whose origins date back a century or more will likely combine remits that no longer make sense today. For example, in Finland, the Ministry of Transport and Communications (LVM) exemplified a combinatory logic compatible with a time when transportation and communications infrastructure were developed simultaneously. But today, transportation and communications (ICT) are moving closer to each other. Nevertheless, the concept of "transportation as a service" with a well-functioning communication infrastructure is emerging (LVM, 2016). Robotisation and self-driving vehicles are also transforming the transportation ecosystem in this direction (Pilli-Sihvola et al., 2015). While the problems the public sector faces today have changed considerably, established public institutions still struggle to change. This is one of the core challenges of systems thinking in the public sector. It is critical to understand this issue, as prior analyses have shown that changing the architecture of the system can have a more profound impact than discrete policy interventions following an ad hoc diagnosis of policy failures (see OECD, 2015: 43 for references).

Systems approaches to public service delivery: Approaches and emerging evidence

The introduction to this chapter discussed the application of system lenses to complex challenges faced by the public sector. Here, the report explores the question of how systemic approaches have been applied to the transformation of public service delivery.

There have been several proponents of system thinking in the public sector,[11] as well as in connection with the development and application of management theories to public service delivery. The shift in interest to system approaches is linked to the understanding of citizens as an integral part of service delivery as "co-producers" or "co-creators", who possess important information on the performance of the system.

While no discrete list of characteristics exists for good service delivery in the public sector, some elements have been outlined in the literature. These include: knowing the service users (their requirements, expectations, etc.), having a user-focused mind-set, designing services according to service users' needs and measuring success from the viewpoint of end-users (Osborne, Radnor and Nasi, 2013: 139). However, a focus on reforming discrete elements of public service delivery systems (in connection to the service-dominant logic)[12] has also been critiqued, as more profound system-level problems are not brought to light (Jung, 2010; Powell et al., 2010). This is especially important in the public sector, due to the increasingly fragmented and inter-organisational context of public service delivery, where systems have become more complex and

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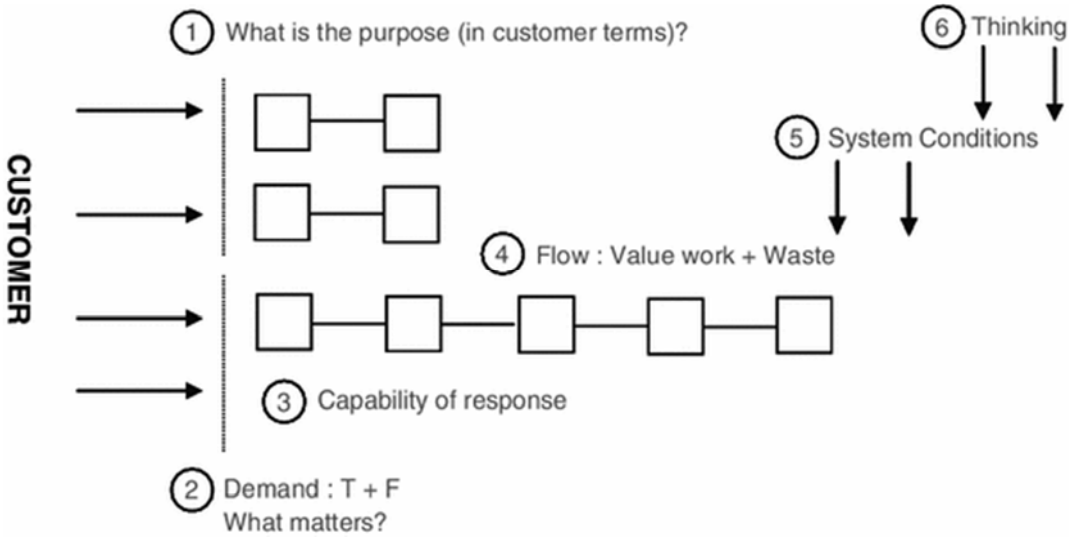
problems more difficult to deal with (Osborne, Radnor and Nasi, 2013: 135). This means that changing the service delivery system for a single public sector organisation or an agency may not deliver the desired effect.

One example of systems thinking applied to service delivery is the Vanguard Method (following Seddon's "Check-Plan-Do" cycle) developed for use in service organisations. This method identifies two different types of demand in service organisations: *value demand* (what the organisation is asked to do or provide/which problems to solve) and *failure demand* (demand caused by failure to provide the right service or product to the customer). This model starts by identifying the purpose in user terms and quality demand. It then moves to checking capabilities and rebuilds the system in ways to eliminate redundancies and "waste" and focuses on the processes that generate value for the user (see Figure 1.4).

Figure 1.4. The Vanguard Method



Source: Seddon (2003: 112).

The Vanguard Method has been applied to public sector organisations. For example, the case study in Chapter 3 dealing with child protection in the Netherlands shows that implementing systematic change in the public sector takes time, but can have very positive outcomes (see Box 1.4). The Vanguard Method, in particular, gives practitioners a chance to undergo individual learning processes that are necessary in order to change their institutional processes.

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Box 1.4. Child protection in Greater Amsterdam

Jeugdbescherming Regio Amsterdam (Child and Youth Protection Services in the Amsterdam area, CYPSA) is the public youth protection agency of Amsterdam. Each year, it looks after 10 000 at-risk children with the help of 600 staff. In 2008, the agency was placed under heightened supervision by the inspection services and the Amsterdam alderman because it was unable to fulfil its core mission: assessing risks posed to vulnerable children and providing timely help. In 2011, a large-scale redesign of the organisation was initiated with the designated aim of keeping "Every child safe". A core group of ten caseworkers, two team managers, two psychologists and a consultant trained in the Vanguard Method were given the authority to redesign internal processes.

Over a period of three months, the group conducted the "check", "plan" and "do" phases of the Vanguard Method and delivered a working approach ("doing" what was "planned"). The check showed that CYPSA was split organisationally across different roles: social workers working with parents on a voluntary basis, guardians who had legal responsibility over children and parole officers working together with convicted juvenile offenders. As a result, there was no one single contact point for families. Case workers were therefore unsure who should act on signals of risk to children. Instead, they worked with established protocols and forms of reporting that were not central to the mission at hand – keeping children safe. The planning phase established new principles of action and outlined phases of engagement. Case workers would deal with the whole family system and communicate directly with families (the "Functional Family Parole Services"). Previous silos were to be abolished and replaced with teams organised around potential cases. A focus was placed on early intervention and holistic care of the entire family.

After the initial analysis, three teams of volunteers were given three weeks to complete the process and simultaneously undergo their own learning process. This was followed by a "rolling-in" stage during which 40 teams were taken through the process to experience their own "check", "plan" and "do" phases. This lasted a full year and required additional changes to supporting services such as IT, facilities and so on.

The whole process exceeded initial expectations: it improved both the quality of the public service and diminished the associated costs. The number of cases where children had to be forcibly removed from families decreased by 50%. The changes reportedly resulted in annual cost savings of EUR 30 million. In 2015, CYPSA was elected the Best Public Sector Organisation in the Netherlands (see Chapter 3 for more details of this case study).

Source: Wauters and Drinkgreve (2016).

While there is case-specific evidence that systems approaches (including the Vanguard Method) have been applied in the public sector, there are no systematic reviews of their success or failure. Public sector organisations tend not to make available the specificities of reform processes. Consequently, there is also a lack of research regarding which specific systems approaches fit a specific context. Nevertheless, systems approaches have been applied across a variety of fields in social research and action research. For example, systems thinking has been applied to address issues including:

- Childhood obesity and social policy in Australia (Allender et al., 2015; Canty-Waldron, 2014).
- Child protection in England (Lane, Munro and Husemann, 2016).

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- Design/management of children's services in England and Wales (Gibson and O'Donovan, 2014).
- Health prevention including obesity and tobacco,[13] mental health services in North Wales (Evans et al., 2013) and public health more generally[14] (WHO has applied systems thinking to health systems reform) (WHO, 2009).
- Higher education in the United Kingdom (Dunnion and O'Donovan, 2014).
- Environmental follow-up in Sweden (Lundberg, 2011), waste oil management in Finland (Kapustina et al., 2014.) and sustainable food consumption in Norway (Vittersø and Tangeland, 2015).
- Infrastructure planning in Australia (Pepper, Sense and Speare, 2016).
- Military and political affairs in the United States (de Czege, 2009).

One of the most well-known systems exercises in the public sector is the Munro Review of Child Protection (see Box 1.5). It utilised a multitude of systems approaches without devising a concrete methodology (in comparison to the Vanguard Method), with the aim of showing how different reforms interact and the effects on the system's objectives before developing a narrative account to explain what needs to be changed. While the review received broad coverage in the media and positive reactions from practitioners, implementing the recommendations was not straightforward. The process was time-consuming and complex, as the involvement of many actors was necessary to change public policy systems. For example, during the process of organisational redesign it may be necessary to transfer authority from one organisation to another. In the public sector context, this often requires legislative changes (as was the case with the Munro Review). These issues can become magnified if problems fall between municipal and state mandates. For example, it can be very difficult to plan working transportation systems across municipal boundaries to take into account desired moving patterns.

Box 1.5. The Munro Review of Child Protection

One of the most well-known examples of systems thinking in the public sector is the Munro Review of Child Protection in England. In 2010, the Department of Education commissioned Professor Eileen Munro to perform an independent review with a view to reforming the child protection system. The goals were to understand why policies were not yielding the desired results (protecting children from abuse and neglect) and to design a system of child protection based upon the new insights.

The central question in the analysis was: "What elements can help professionals make the best possible judgements to protect vulnerable children?" The analysis demonstrated that the system had become overly bureaucratic and focused on compliance rather than the welfare and safety of children. In other words, the system was working in service of itself rather than its "clients".

The Munro Review was published in several stages. In 2010, a "Systems Analysis" of the current child protection system was published. This was purposely analytical and aimed at policy makers. It showed how reforms interact and the effect these interactions were having on institutional practices. In 2011, a second report entitled "The Child's Journey" traced children's experience in the system from needing to receiving help. The report also underlined the need to work with children and families who have not yet met the threshold for child protection. Following extensive consultation, a final report detailed how to develop a more child-centred system of child protection together with a flexible assessment system.

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Box 1.5. The Munro Review of Child Protection *(continued)*

The review used causal loop diagrams (CLDs) to communicate how causal relationships in the child protection system worked, and to visualise how the "compliance culture" had evolved. Several other concepts from systems theory were also used in the review including single and double-loop learning, ripple effects, requisite variety and socio-technical systems, among others.

Following publication of the review, the Secretary of State for Education issued eight trials based on its recommendations. These resulted in unintended consequences due to exogenous factors including rocketing caseloads and public sector cuts (Munro and Lushey, 2012). Further roll-out of the system was postponed due to government delays in changing statutory guidance.

Sources: Munro 2010, 2011a, 2011b.

Research shows that without proper training and clear guidelines, practitioners return to previous delivery models, even if systems approaches are used to re-evaluate public service conditions (see Carey et al., 2015: 4). Although this is essentially human nature, such unwillingness to embrace new ways of working continues to be one of the biggest barriers to change in the public sector (NAO, 2006). Active resistance to change and political lobbying against reform also comes from powerful incumbents, as has been noted in the case of the energy sector.

The broader public sector change and innovation literature highlight several factors that can inhibit systems change in the public sector. These include: unwillingness among managers to take risks (e.g. Osborne and Brown, 2011; Torugsa and Arundel, 2015), possible political scrutiny from opposing parties (Potts and Kastelle, 2010), short-term delivery pressures, organisational culture in the public sector and low levels of management autonomy (Bysted and Jespersen, 2014; Lægreid, Roness and Verhoest, 2011). Prominent systems thinker, Jake Chapman, has outlined some of the characteristics linked to systems failure in policy making (Chapman 2002: 13):

- aversion to failure
- pressure for uniformity of public services
- perception that command and control is the best way to exercise power
- lack of evaluation of previous policies
- lack of time
- tradition of secrecy
- siloed systems and dominance of turf wars
- complicated procurement systems that limit experimentation
- loss of professional integrity and autonomy under the knife of efficiency.

Not all of these factors are uniformly applicable across the public sector. For example, some countries exhibit a higher level of discretionary learning (staff taking responsibility and exercising agency to solve problems), which helps to introduce bottom-up systems-level change (Arundel, Casali and Hollanders, 2015; Kaasa 2013). Likewise, institutions that are not mature or still developing are more receptive to change, making fundamental systems-level change more likely in administrative contexts with less path

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dependencies. Practitioners and public sector managers usually have little control over organisational culture after it has segmented or become institutionalised, so existing systems or even policy capacity can be a pre-determining factor for instigating systems-level change. In addition, different government functions divided into a "silo system" can have large path dependencies, which become a large barrier to changing public service delivery systems (Bason, 2010). Hence, many public sector organisations are ill equipped to deal with new, complex and wicked problems.

Such contextual problems raise key questions: Is there room for systems approaches in the public sector? How can systems change be introduced into the public sector? Only a handful of surveys have explored these questions. In 2001, a US survey showed that 50% of innovations were initiated by front-line staff and middle managers, 70% arose in response to a crisis and 60% resulted specifically from austerity measures (Borins, 2001). In many cases, political opportunities to create momentum for systems-level change result from crises (McCann, 2013), which in turn drives innovation and change in the public sector (Kay and Goldspink, 2012). Both the physical emergence of crises and the perceived threat or public uproar can function as a window of opportunity to use systems approaches to reconfigure public service systems and policy on a larger scale. Crises tend to suspend the rules and norms that limit experimentation. Most importantly, a crisis can be an opportunity to step back and ask questions about the core purposes of programmes or services. By questioning and reasserting purpose, an administration creates an opportunity to redesign not only services, but how those services are resourced, managed and renewed if and when the crisis recedes.

Box 1.6. Outcome-based approach to public service reform in Scotland

In 2007, the Scottish National Party won the Scottish Parliamentary election for the first time. The party gained 47 seats and decided to form a minority government. This meant that the government had to find a larger consensus base to implement policy reforms. The government decided to reform its structure and adopt an outcome-based approach, later termed the Scottish Approach to Public Service Reform. While the process cannot be described as a systems approach, it had the characteristics of a broader systems-level change.

The reform effort started by identifying universal goals across government. These discussions were held among the top leadership comprising a small circle of senior civil servants and politicians. This process led to agreement on 14 vision statements describing the Scotland the leadership wanted to build. By necessity, these statements were broad and all-embracing and, as such, were difficult to dispute. The statements were transformed into formal national outcomes, which form the backbone of the National Performance Framework (NPF). There are currently 16 national outcomes which are widely accepted in Scotland:

- We live in a Scotland that is the most attractive place for doing business in Europe.
- We realise our full economic potential with more and better employment opportunities for our people.
- We are better educated, more skilled and more successful, renowned for our research and innovation.
- Our young people are successful learners, confident individuals, effective contributors and responsible citizens.
- Our children have the best start in life and are ready to succeed.
- We live longer, healthier lives.

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Box 1.6. Outcome-based approach to public service reform in Scotland *(continued)*

- We have tackled the significant inequalities in Scottish society.
- We have improved the life chances for children, young people and families at risk.
- We live our lives safe from crime, disorder and danger.
- We live in well-designed, sustainable places where we are able to access the amenities and services we need.
- We have strong, resilient and supportive communities where people take responsibility for their own actions and how they affect others.
- We value and enjoy our built and natural environment and protect it and enhance it for future generations.
- We take pride in a strong, fair and inclusive national identity.
- We reduce the local and global environmental impact of our consumption and production.
- Our people are able to maintain their independence as they get older and are able to access appropriate support when they need it.
- Our public services are high quality, continually improving, efficient and responsive to local people's needs.

These broad outcomes made it necessary to work across government silos. It soon became clear that success depended on changing the structure of government administration. This led to the abolition of department structures in the Scottish Government. Ministries were reformed in line with the responsibility areas of the national outcomes.

Following the leadership-focused start of the reform process, the government took a partnership-centred approach across central and local government and public services. Specific goals and key stakeholders were identified for each policy area under the national outcomes. Three main elements were emphasised to achieve the goals: (i) assets and strengths of individuals and communities; (ii) co-production of policies with people; and (iii) improvement in the local ownership of data to drive change. This signified a move within public services from top-down, service-led, reactive delivery towards more personalised, preventative and collaborative ways of working. Broader-based workshops followed to identify more concrete outcomes and measurement indicators under different national outcomes. Thus, the overarching NPF is strengthened by a list of detailed outcomes frameworks operating at local and national levels. To promote the change process at the local level, the government adopted a 3-Step Improvement Framework for Scotland's Public Services outlining the guiding principles to help achieve improvements in different outcome areas.

The reform process was successful in creating a common vision at the national level and inspiring new initiatives at the local level. It recognised complexity and the necessity of change and innovation. Nevertheless, the interviewed experts noted that much of the reform effort was guided by measurement efforts. Initially, 45 indicators were set to accompany the national outcomes in the NPF. These were supposed to enable the government and the public to track progress towards the national outcomes. While the government tried to move away from targets, inputs and outputs, this proved difficult. Many outcomes (e.g. community engagement, cohesion, trust, social connectedness/capital, etc.) were difficult to measure, which necessitated a reliance on proxies and led to problems with establishing the effect policy activities had on changes in indicators.

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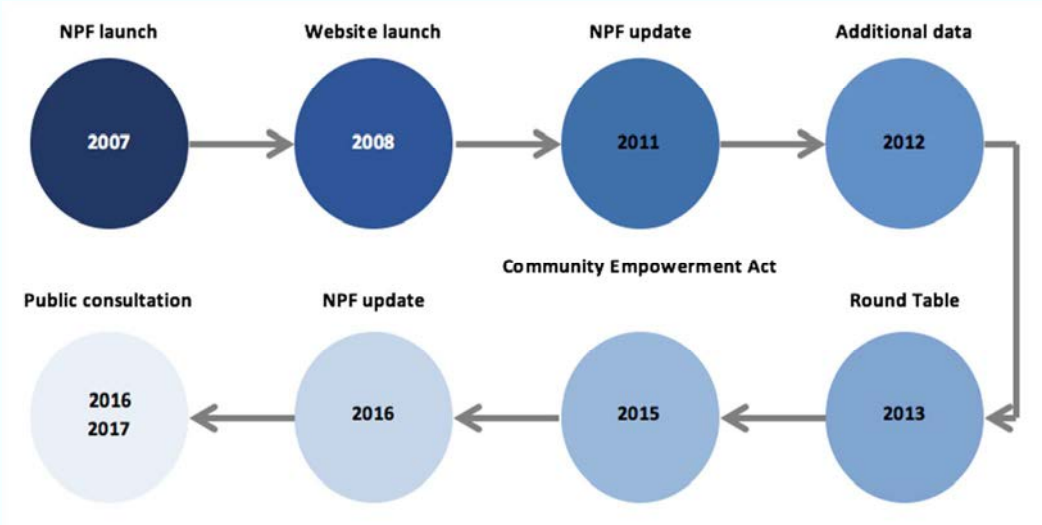
Box 1.6. Outcome-based approach to public service reform in Scotland *(continued)*

For example, the government wanted to measure "how well families were nurturing their children". In the absence of specifically developed indicators, the reform process used dental checks of children (which have been linked to more nurturing families). However, this indicator does not measure the domain the government actually wanted to influence. Meaningful measurement and the ways in which it supports outcome-oriented activities (and not only accountability) has been the main area of critique regarding this approach. The recent What Works position paper (Cook, 2017) noted – among other suggestions – that the approach needs to maximise not only the learning from outcomes, but also the method by which these outcomes are delivered. The approach needs to be tailored to the context of the purpose, which means that the collected data have to be meaningful and measurable for the purpose and use multiple forms of evidence.

With that said, the Scottish Government has been continuously improving the NPF. It was revised in 2011 to reflect lessons learned during the previous government and the priorities outlined in different review documents (e.g. Manifesto Commitments, the Government Economic Strategy, Programme for Government and Spending Review documents). A key change was the expansion of indicator sets to 50 indicators. In 2015, a broader engagement process was initiated with 15 indicator workshops involving external stakeholders from sectors including health and social care, the built environment, justice and communities, children and families, economy and skills, culture and external affairs. As of 2017, there are 55 national outcome indicators and greater attention is being paid to review of the framework.

Figure 1.5. The development of Scotland's National Performance Framework



Sources: Cook. (2017); Scottish Government (2016).

However, systems approaches should function as a continuous, dialogic process. Policy makers should not wait for political crisis to implement change. Business-as-usual conditions should provide opportunities to implement systems approaches in the public sector. Regardless of the different types of public sector organisations and context, there is evidence that policy entrepreneurs – committed leaders – can create space for change in any institutional context (Leonard, 2010). It has also proven possible to overcome budget

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and temporal uncertainty and restrictions if practitioners have the will to work towards the transformation of a system (Torugsa and Arundel, 2015). Personal leadership and commitment on the part of key individuals is an important factor in supporting successful change in the public sector (Pärna and von Tunzelmann, 2007), even if this occurs in a piecemeal fashion. What matters is that work towards systems change is initiated and sustained as fully as possible. Strategies that open up organisations and support outside collaboration with enterprises and citizens also enforce organisational learning, and help speed up and spread the adoption of change (Walker, 2013). Nevertheless, broader engagement with systems approaches may require a substantive shift in the culture and operations of public organisations.

Notes

1 Path dependency is a concept of historical institutionalism conveying an extended time period of considerable stability in public policymaking – persistence of policy trajectory – that may be punctuated by turbulent, formative moments (Peters et al., 2005).

2 A useful shorthand is to think of the phrase "systems thinking" as describing the ability to understand the properties and dynamics of complex systems. Its increasingly popular twin, "design thinking", generally describes the process of ordering information in complex systems in such a way that leads to action.

3 "Six Sigma is a technique for improving process quality originally developed by Motorola in the U.S. in 1986 and later adopted on a large scale and popularized by firms such as General Electric. The name Six Sigma derives from the statistical probability of an error rate (or a defect rate in the case of manufacturing) outside of six standard deviations from the mean … Motorola and others firms have developed certification procedures for training people in Six Sigma techniques that result in various levels of certification such as black belt, green belt, etc. Currently, Six Sigma is used in many firms and different sectors of industry" (Verma, 2012: 7-8).

4 Draulans and De Tavernier (2016) analysed the care needs of older people in Turkish communities in Belgium. They showed that traditional public service delivery systems do not work for individuals from a different cultural background, who tend to be ignored by the system. New policy networks and approaches are needed to reach people from different communities.

5 "Command and control administration" refers to a traditional, hierarchical planning model (see Seddon, 2008).

6 See WHO (2009) in the case of health systems.

7 Agencification describes the process of creating semi-autonomous agencies operating at arm's length from the government administration within the public sector, as part of the New Public Management (NPM) reforms since the 1980s (Overman and Van Thiel, 2016).

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8 Public sector organizations normally use some form of fixed price contracts in which time, cost and scope of activity are fixed in the procurement process. This usually means that the supplier takes the brunt of the risk at the forefront, and changing activities based on feedback and "learning by doing" becomes very difficult later on. This is easily exemplified in software development processes (Book, Gruhn and Striemer, 2012).

9 See the case study on Micro-purchase Platform in OECD (2017: 99).

10 In the context of public sector innovation measurement, see Kattel et al. (2015).

11 These include Jake Chapman at Demos in the United Kingdom, and John Seddon with lean systems (under Vanguard Consulting) and the more detailed Vanguard Method. Recently, NESTA and other think tanks/policy labs have discussed the use of systems thinking within the public sector in the context of public sector innovation. Donella Meadows' work has also been used in the public sector context, but her perspective on systems theory and, in particular, leverage points was not specifically developed with public service delivery in mind.

12 Osborne, Radnor and Nasi (2013) argue that public management theory is changing towards a "fit-for-purpose" approach, which sees public services as services, with a distinctive service-dominant logic and managerial challenges. This implies a rejection of previously applied product-dominant public management theory. A service-dominant approach places "activities driven by specialized knowledge and skills, rather than units of output, at the centre of exchange processes" (Lusch and Vargo, 2006: 55).

13 See the overview of obesity policy in Bures et al. (2014), and Johnston, Matteson and Finegood (2014).

14 See the review of relevant papers in Carey et al. (2015).

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References

Ackoff, R.L. and F.E. Emery (1972), On Purposeful Systems: An Interdisciplinary Analysis of Individual and Social Behaviour as a System of Purposeful Events. Tavistock, London, UK.

Allender, S. et al. (2015), "A community based systems diagram of obesity causes", *PloS one*, Vol. 10/7, pp. 1-12.

Arundel, A., L. Casali and H. Hollanders (2015), "How European public sector agencies innovate: The use of bottom-up, policy-dependent and knowledge-scanning innovation methods", *Research Policy*, Vol. 44, pp. 1271-1282.

Bason, C. (2010), Leading Public Sector Innovation: Co-creating for a Better Society. Policy Press, Bristol, UK.

Book, M., V. Gruhn and R. Striemer (2012), "adVANTAGE: A fair pricing model for agile software development contracting", *Agile Processes in Software Engineering and Extreme Programming*, 111, pp. 193-200.

Borins, S. (2001), *The Challenge of Innovating in Government.* PricewaterhouseCoopers Endowment for the Business of Government, Arlington, VA, www.strategie-cdi.ro/spice/admin/UserFiles/File/CA%20The%20Challenge%20of%20innovating%20in%20government.pdf.

Bures, R.M. et al. (2014), "Systems science: A tool for understanding obesity", *American Journal of Public Health*, Vol. 104, p. 1156.

Burns, T. and F. Köster (eds.) (2016), *Governing Education in a Complex World*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264255364-en

Burns, T., F. Köster and M. Fuster (2016), *Education Governance in Action: Lessons from Case Studies*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264262829-en

Bysted, R. and K.R. Jespersen (2014), "Exploring managerial mechanisms that influence innovative work behaviour: Comparing private and public employees", *Public Management Review*, Vol. 16/2, pp. 217-241.

Canty-Waldron, J. (2014), "Using systems thinking to create more impactful social policy", *Journal of Futures Studies*, Vol. 19/2, pp. 61-86.

Carey, G. et al. (2015), "Systems science and systems thinking for public health: A systematic review of the field", *BMJ Open*, Vol. 5/12, p. e009002.

Centre for Ageing Better (2017), Case Study Submission for OECD Paper "Working with Change: Systems Approaches to Public Sector Challenges".

Chapman, J. (2002), System Failure: Why Governments Must Learn to Think Differently (2nd edn). Demos, London.

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Created from aalto-ebooks on 2017-12-04 07:59:53.

Cook, A. (2017), *Outcome Based Approaches in Public Service Reform*. Position Paper. What Works Scotland, Glasgow, Scotland, http://whatworksscotland.ac.uk/wp-content/uploads/2017/04/OutcomeBasedApproachesinPublicServiceReform.pdf.

Curtatone, J.A. and M. Esposito (2014), "Systems thinking: A better way to make public policy", *Governing*, 18 August 2014, www.governing.com/gov-institute/voices/col-systems-thinking-public-policy-programs.html.

de Czege, H.W.U.A. (2009), "Systemic operational design: Learning and adapting in complex missions", *Military Review*, Vol. 89/1, p. 2.

Draulans, V. and W. De Tavernier (2016), "Vanaf mijn tiende een sandwichkind. Intergenerationele zorg en samenwonen in de Genkse Turkse gemeenschap" [Intergenerational care and cohabitation in the Genk Turkish community], in D. Luyten, K. Emmery, E. Mechels (eds.), *Gezinnen, Relaties en Opvoeding, Vol. 1, Zoals het klokje thuis tikt. Samenhuizen van volwassen kinderen met hun ouders*. Garant, Antwerp, Belgium, pp. 83-99.

Dunnion, J. and B. O'Donovan (2014), "Systems thinking and higher education: The Vanguard Method", *Systemic Practice and Action Research*, Vol. 27/1, pp. 23-37.

Evans, S. et al. (2013), "System-level change in mental health services in North Wales: An observational study using systems thinking", *International Journal of Social Psychiatry*, pp. 337-351.

Feldman, M.S. and J.G. March (1981), "Information in organizations as signal and symbol", *Administrative Science Quarterly*, Vol. 26/2, pp. 171-186.

Flood, R.L. and N.R. Romm (1996), "Contours of diversity management and triple loop learning", *Kybernetes*, Vol. 25/7/8, pp. 154-163.

Gibson, J. and B. O'Donovan (2014), "The Vanguard Method as applied to the design and management of English and Welsh Children's Services departments", *Systemic Practice and Action Research*, Vol. 27/1, pp. 39-55.

Hämäläinen, T.J. (2015a), "Governance solutions for wicked problems: Metropolitan innovation ecosystems as frontrunners to sustainable well-being", *Technology Innovation Management Review*, Vol. 5/10, pp. 31-41.

Hämäläinen, T. (2015b), How to Deal with Growing Complexity and Uncertainty? How can Decision-makers Deal with Increasingly Complex and Uncertain Systems? 14 August 2015. SITRA, Helsinki, www.sitra.fi/en/blogs/weekly-notes-week-33-how-deal-growin-complexity-and-uncertainty-0.

Head, B.W. (2010), "How can the public sector resolve complex issues? Strategies for steering, administering and coping", *Asia-Pacific Journal of Business Administration*, Vol. 2/1, pp. 8-16.

Head, B.W. and J. Alford (2015), "Wicked problems implications for public policy and management", *Administration & Society*, Vol. 47/6, pp. 711-739.

Johnston, L.M., C.L. Matteson and D.T. Finegood, (2014), "Systems science and obesity policy: A novel framework for analyzing and rethinking population-level planning", *American Journal of Public Health*, Vol. 104/7, pp. 1270-1278.

Jung, T. (2010), "Citizens, co-producers, customers, clients, captives? A critical review of consumerism and public services", *Public Management Review*, Vol. 12, 439-446.

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Chapter 2.

Towards a framework for systems transformation

This chapter starts by highlighting the multi-method nature of new systems-based practices. It discusses how systems thinking differs and complements design thinking, and how design can be used in systemic change processes. It discusses how, under conditions of complexity and uncertainty, governments can reflect in action and work with relative precision. The chapter discusses how decision makers and public services managers can consider the kinds of challenges they face, the resources available to them and what they can expect while engaging in a rigorous problem-solving process using systems approaches. Following this discussion, the chapter identifies some key principles and tactics – people and place, dwelling, connecting, framing, designing, prototyping, stewarding and evaluating – involved in using systems approaches in the public sector. Specific practices are dependent on the context, institutional capacity, problem, timeframe and resources available to public administrations as they embark on systems change.

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New systems-based practices

Innovative approaches to problem solving and service delivery are proliferating across governments that are contending with complex problems for which there are few precedents or solutions. Front-line public servants are simultaneously dealing with "customers" who have come to expect tailored, responsive products and services similar to those they routinely experience in their interactions with business, especially the tech industry.

The inability of command and control systems to cope with these demands has created a vacuum into which new systems-based practices are stepping. However, many of these efforts remain at the margins, often organised into "labs" that have the space and mandate to innovate government processes. They have yet to move toward the centre of government or to tackle the norms and standards that dictate the behaviour of civil servants. The following include notable efforts to promote systems-based practices:

- In the United Kingdom, NESTA has worked to build an ecosystem of systems and design-based practices around government through its social innovation programmes, i-teams and Creative Councils, among others. The Centre for Aging Better also promotes systems-based practice (see Box 1.3).
- SITRA's Helsinki Design Lab, Strategy Unit and partnerships with organisations such as Demos Helsinki have deployed systems approaches on issues such as clean tech and urban decarbonisation. They have also worked to develop the theoretical and practical underpinnings of systems approaches and strategic design.
- The MaRS Discovery District in Toronto hosts organisations and businesses with the potential to be change agents, and helps to build their capacity and expertise. The MaRS Solutions Lab works at the intersection of design and systems thinking to develop solutions, policy and capacity around complex societal challenges such as health, work and food. Their *Periodic Table for Systems Change* (see Figure 3.14 in Chapter 3) provides a useful framework for understanding the different kinds of elements required to navigate and alter complex systems.
- In the United States, the Office of Personnel Management's Lab@OPM works to disseminate design and systems-based practices and tools across government through training programmes for government workers and contractors. It also provides a platform to bring together other federal agencies to address complex challenges.
- MindLab, Denmark's cross-government innovation group, emphasises the importance of citizen involvement, voice and co-creation, all of which necessitate systems approaches. Its staff includes designers, sociologists, ethnographers and other professionals who work in blended teams together with citizens.
- The Australian Centre for Social Innovation (TACSI), a not-for-profit funded by government, applies design and social research to co-creative processes in order to tackle difficult social, economic and environmental problems. They search for ways to crack "open the current system at crisis points" (Puttick, Baeck and Colligan, 2014) and develop new services to fulfil unmet or neglected needs. Their well-known "Family by Family" project is a good example of this approach. By working to address the seemingly intractable problem of dysfunctional

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families, TACSI aims to reduce the growing demands on social services by pairing families that have overcome crises with families currently in the midst of crisis. Their critical insight was not to ask how to mitigate chronic stress, but to imagine what might a successful family under difficult circumstances look like. Once they had established that the target was thriving families, not mitigation, they were able to design better, more impactful services.

Systems thinking and design thinking: different but complementary approaches

There is currently a surge of interest in *design thinking* in the public sector, especially in relation to co-designing public services with citizens through participatory processes.[1] (The proliferation of "sticky notes" in government offices is a strong sign of this shift – see the section in this chapter on *People and place*). However, the interlinkages between service design and systems thinking have to be made clear, especially as regards the emergence of "design thinking" (Rowe, 1987) and design management (e.g. see Cooper Junginger and Lockwood, 2009). The former denotes the use of design methods to match consumer needs and value, taking into consideration technological viability and business strategy (see Brown, 2008; Martin, 2009), while design management is geared more towards prototyping, although some approaches also include elements from systems thinking (e.g. understanding user experiences, ideation, rapid prototyping and systems visualisation) (Mulgan, 2014).

The increased popularity of "design thinking" in the policy realm has led to the proliferation of different toolboxes and guides on how to use design and design thinking in the public sector, some of which mention systems thinking in combination with design tools.[2] In general, these methodologies try to rationalise change processes within the public sector and are therefore reductionist to a degree. (By definition, tools and toolkits that are divorced from the underlying principles used to create them constitute a reductionist approach even when labelled "systemic".) There is friction between the context-specific nature of systems analysis and the latest push for a generic "toolbox" approach in the public sector. Nevertheless, designers working in the public sector also see themselves as craftsmen, designing for contextual demands and user needs in practice, and not for archetypical situations.

However, there are no clear-cut guidelines as to how systems thinking and design thinking approaches fit together. Some publications regard system thinking as a part of a larger design skill-set (Mulgan, 2014), while others apply design as a tool within a larger systems thinking approach (e.g. see Gharajedaghi, 2011). The origins of systems thinking and design thinking are clearly different – design thinking originated from product design approaches[3] and design emerged more broadly from architecture and product design – however, they are interlinked concepts. Systems thinkers were already using design as a concept in the 1980s, albeit largely as a "problem-solving tool" (e.g. Ackoff 1981; Argyris and Schön, 1978). What is important to note is that *systems thinking is not just systematic design*. Systems thinking at its core is oriented towards organisational learning – reflection in action. However, the practical application of systems thinking is often characterised by a narrow focus on systematic design (Li, 2002: 387).

Design is a useful bridge for integrating systems thinking into everyday organisational learning (ibid.: 392). Hence, some view the popular combination of design thinking with evidence-based policy making as a means to rejuvenate interest in systems thinking in the public sector (Wastell, 2010). However, design thinking tends to deal with events, problems and the application of tools. It concentrates on action, prototyping

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("thinking through doing") and is usually associated with Herbert Simon's rational-technical problem-solving logic (Dorst and Royakkers, 2006). In many cases, the feedback loop from an implementation phase is weak (which represents a clear break from traditional design practices). Furthermore, rational problem solving may not account for more complex changes in value distribution. This is particularly notable in cases where policy makers select a solution that is unsatisfactory overall but satisfies current conditions (ibid.), potentially resulting in piecemeal solutions that hide underlying structural policy problems. Accordingly, service designers that concentrate on second or third-order design problems directly connected to user needs may neglect fourth-order design problems[4] – systems integration – which are often linked to wicked problems (Junginger, 2014: 148-149).

For example, design methodologies employed by public sector innovation labs often use rapid prototyping; however, many of these solutions do not fit within the broader public service system (Tõnurist, Kattel and Lember, 2015). This makes it difficult to move beyond experimentation to long-term exploration.[5] A systemic design guide published by Alberta CoLab exemplifies this approach (Box 2.1). While Alberta CoLab use many systems thinking tools, they do not tackle implementation, which in the public policy context may constitute the most difficult part of the process due to feedback from traditional institutions, established bureaucratic procedures and short political lifecycles.

Box 2.1. CoLab's systemic design field guide (Canada)

In 2016, Alberta CoLab published the guide *Follow the Rabbit: A Field Guide to Systemic Design.* It was developed with staff of the Government of Alberta in mind, but can be applied to different public policy areas, sectors and intersections.

CoLab outlined five key characteristics of systemic designers – they are inquiring, open, integrative, collaborative and centred. Accordingly, they adopted a simple formula: playfulness + discipline = creativity.

The guide describes a systemic design project, introducing the following phases for systems design projects: planning, workshops and evaluation. The methods used include steps such as "look" (which includes tools such as interviewing for empathy, empathy maps, keep asking why and ethnography); "frame" (rich pictures, systems maps, iceberg diagrams, CLDs, concept maps, six thinking hats, speed dating, affinity diagrams, card sorts and world cafes); "generate" (participatory prototyping and dotmocracy) and "adapt" (reflection and action space).

According to the guide, the nature of the problem should be outlined during the planning phase. A systemic design approach should be used only if the problem is complex, otherwise, such an approach would be deemed "overkill". Additional important questions to consider include: Is the client open to change? Does the client have "top cover" (i.e. a senior-level champion)? Is the client committed (i.e. has adequate resources and willing to implement the project)? And, most critically: Has the client been identified?

"Sequencing" plays an important role during project workshops and involves: bringing in external perspectives, ideation, testing, integrating findings, evaluating processes, implementing and sharing results, and maintaining momentum during workshops. Certain specific roles need to be allocated including a facilitator (usually an outside designer), recorder, note taker and narrator. Each workshop is followed by an evaluation and, after a few months, a "check back" to take note of any progress or changes. The approach is design centred and focuses on workshops, but does not explore implementation.

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Systems thinking helps to place a managerial problem into context as a part of systems events (e.g. a discrete client-service interaction), and patterns and structures (rather than events alone for which design solutions are applied).[6] At the same time, systems thinking can over-emphasise analysis ("thinking it through") and neglect action, which may result in problems. In practice, the two approaches are complementary. The danger is that both approaches tend to become overly rigid when applying their specific methodologies, which can limit their use in broader policy-making circles.

Design has always been concerned with the interactions between people and things. For much of its history, these things have tended to be objects. But, increasingly, design is working at the intersection of people, processes and outcomes, making it particularly relevant for managing a transition towards human-centred policies and services. Human-centred design (HCD), strategic design, design thinking and other variations have gained traction in many administrations that are moving to re-orient processes around their citizens. Other systems approaches are also well positioned to better incorporate citizens' interests into public services as principal stakeholders.

Strategies to manage complexity: What are the options for the public sector?

Complexity arises when systems are not configured to respond to the challenges they face. Ashby's law states that any control system must be at least as complex as the system it is controlling, otherwise a complexity gap will arise from the mismatch.[7] For example, in a tax regime where legislators create increasingly complex regulations, constituents will always be able to develop more means of evading taxes than regulators can address. This situation results from the variety and quantity of avoidance schemes available to lawyers, accountants and tax advisors, which are then multiplied by the variety of individual circumstances. The solution to this complexity gap is not to make tax policy more complex, but to reduce the variety of options available to the public by simplifying the tax regime (Casti, 2012: 56). In essence, reduced variety on the regulatory side will result in a reduced number of responses on the part of those being regulated. Ashby's law may be the most important principle to consider when working on – and especially developing interventions for – complex systems.

Complexity scholars Max Boisot and Bill McKelvey have revived Ashby's law and applied it to the contemporary debate around managing organisations in increasingly complex environments. Their Law of Requisite Complexity holds that "to be efficaciously adaptive, the internal complexity of a system must match the external complexity it confronts" (McKelvey and Boisot, 2009). With respect to managing complexity, organisations have two principal adaptation strategies. The first is to simplify or reduce the complexity of incoming stimuli so as to minimise internal complexity. Such *complexity reduction* can be achieved through abstraction – for example, by creating theoretical models that make information more manageable or actionable. There are risks associated with this strategy that stem from oversimplification, such as in the banking sector where securitisation of residential mortgages shielded unaccounted risks, leading to the global financial crisis. Examples from the public sector abound, but at a systemic level, the organisation of domain authority into ministries is a form of simplification or complexity reduction. For instance, the housing sector is responsible for a significant portion of energy consumption, and people's behaviours within this context drive energy usage, yet governments have formed separate departments of housing, energy and human services. This artificial segmentation of problem spaces reduces complexity, but also limits the degree to which any single organisation can understand and take action to

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address systemic challenges. This results in a complexity gap between problems such as climate change and the government's ability to address these challenges holistically.

The second strategy is *complexity absorption* whereby organisations create internal complexity that is determined to be equal or greater than the external complexity it faces. Complexity absorption leads to requisite variety which in the best case permits an organisation to be adaptive, opening up new kinds of strategic options (Hämäläinen, 2015). But there are risks too: resources can be quickly depleted as the organisation grows in size or diversity (Boisot and McKelvey, 2011) and possibly becomes too complex to be effectively managed (e.g. multinational financial institutions). In the public sector, complexity absorption results in the proliferation of new internal agencies within departments or ministries. For instance, the US Department of State has as many as 71 internal Offices and Bureaus, each with its own remit, leadership, resourcing, cultural norms and legacies. This leads to the remarkable cultural phenomenon that physical proximity to the Secretary of State's office is indicative of the importance, priority or power of a Bureau or Office, as opposed to a more fluid resourcing scheme based on global affairs. On a much smaller scale, the push toward data capture and analytics is also a form of complexity absorption, as public administrations deploy tools that can potentially help them understand their environment more holistically. However, the persistent challenge of big data is the ability to understand and take action on vast amounts of new information; complexity begets complexity.

Boisot and McKelvey describe these interrelated strategies of complexity reduction and complexity absorption, and the trade-offs inherent between them, as the *Ashby Space* (ibid.). Figure 2.1 illustrates this conceptual framework and the potential of design and other systems approaches to manage complexity. The diagonal line represents requisite variety, or an ideal state of dynamic equilibrium where the variety of an organisation's responses (internal complexity) matches the incoming stimuli (external complexity). According to Ashby, equilibrium can be achieved through forms of regulation (Ashby, 1956).

It follows then that *regulation* is the key task of organisations operating in complex environments. The objective of regulation is to move toward requisite variety as complexity increases. As Boisot and McKelvey point out, "the variety that the system then has to respond to depends in part on its internal schema development and transmission capacities and in part on the operation of tuneable filters, controlled by the system's cognitive apparatus, and used by the system to separate out regularities from noise" (Boisot and McKelvey, 2011: 284).

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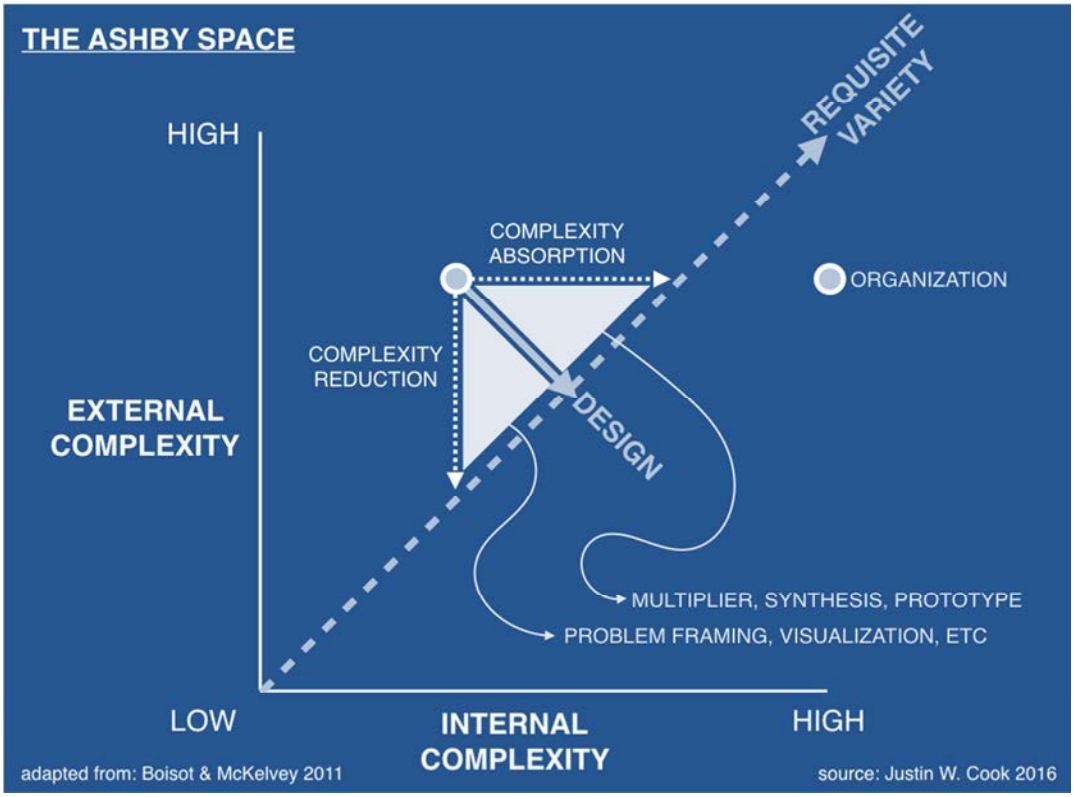
Figure 2.1. The Ashby Space



Source: Based on Boisot and McKelvey (2011).

The organisation depicted in Figure 2.2 is experiencing high levels of external complexity and facing a need for regulation to move it toward requisite variety (stability). As discussed above, there are two strategies to move toward stability within the Ashby Space: become more complex internally or reduce complexity by simplifying variety. An alternate complexity reduction strategy could be to retreat and focus only on core competencies, but this is unusual among most organisations not facing crisis and may be altogether impossible due to the interconnectedness of today's challenges.

However, a third strategy exists for working toward requisite variety that can achieve a more stable position than either complexity absorption or complexity reduction on their own. Design processes and some systems approaches are very effective tools for managing complexity and generating productive outcomes. Employing design principles and methodologies enables an organisation to transit the Ashby Space more efficiently toward requisite variety. The field's growing adoption across multiple sectors where normative tools are no longer achieving results is indicative of its success. While design methodologies still remain largely marginal to more firmly established strategy processes, a shift is underway that is pushing designers deep into organisations and making them part of the system itself. This is enabling designers to move beyond "innovation" teams responsible for novelty to participants engaged in implementation and, therefore, the evolution of the system itself. This shift provides designers with the opportunity to engage self-adaptive systems directly (Ito, 2016).

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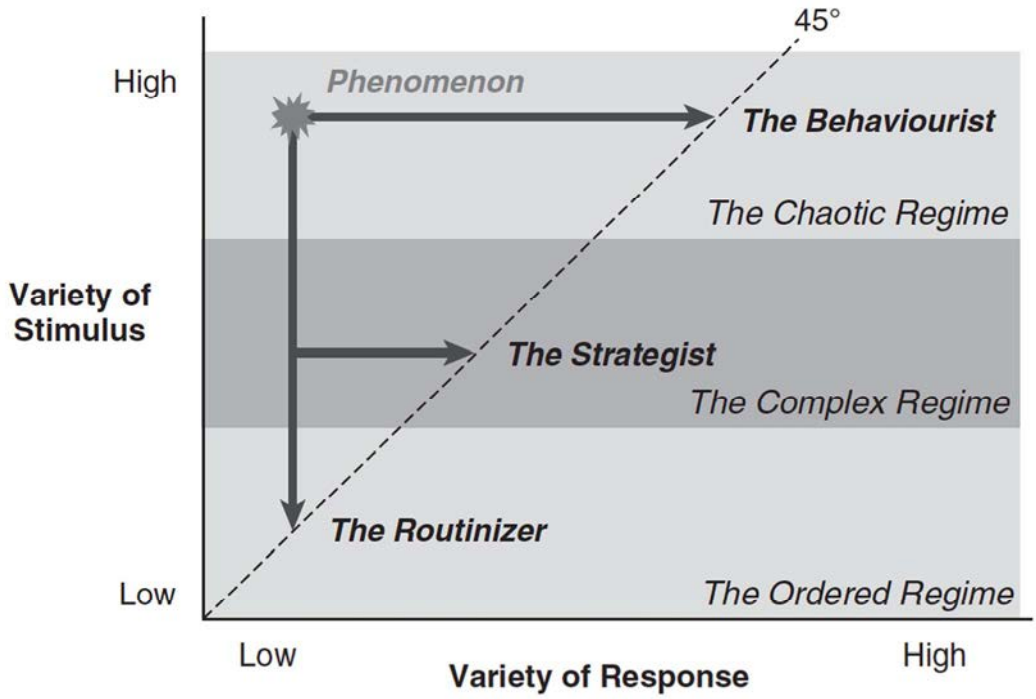
Design has traditionally worked to make sense of complexity through problem framing, visualisation, ethnographic practices, working with relative precision and across disciplinary cultures, and so on. These methodologies do not artificially simplify complexity, but aim to contextualise and order information and then make it actionable. Crucially, design processes that include implementation also create a feedback loop between information, ideas, people and action through prototyping and iteration. Rather than loading more complexity into the structure of an organisation (complexity absorption), design allows for variety to be explored and exploited (and thus reduced) *within the process itself*. By optimising reduction and absorption strategies, design and systems approaches transit the Ashby Space more productively towards requisite variety, enabling what Boisot and McKelvey term the *complex regime* (Figure 2.2), where complexity can be embraced and successful schema can be developed. The following sections explore in greater detail systems approaches and design methodologies that have proven effective within the Ashby Space.

Figure 2.2. Three complexity regimes



Source: Boisot and McKelvey (2011).

Returning to the question of systems change in crisis versus static conditions, what can be learned from the Ashby Space framework? In the face of crisis, organisations tend to adopt a complexity reduction strategy in order to make a situation manageable. This is understandable, and in some cases appropriate. However, experience shows that this approach carries significant risks associated with decisions that can worsen outcomes. For instance, in the aftermath of Hurricane Katrina, which devastated New Orleans in 2005, the Federal Emergency Management Agency (FEMA) supplied thousands of what came to be known as FEMA Trailers, mobile units intended to provide temporary housing. While this quick reaction provided housing relief for those who had lost their homes, many of the trailers contained dangerous levels of formaldehyde, which caused

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significant health issues. Worse still, as of 2015 – a decade after the crisis – people continue to occupy FEMA trailers (Smith, 2015), suggesting an inherent conflict or error in what was designed to be a short-term solution. However, alternative examples of progressive, productive reactions to crisis also exist. As Helsinki Design Lab explored in their 2013 case study *Rebuilding Constitución*, the response to the devastating tsunami that destroyed the city of Constitución, Chile, shows that a systemic, inclusive, co-created solution to redesigning and rebuilding an entire city can be done both efficiently and successfully (Boyer, Cook and Steinberg 2013: 25).

Under static conditions, both complexity absorption and complexity reduction can occur. Returning to the example of the US State Department, the proliferation of Bureaus and Offices suggests a high level of complexity absorption for an administrative body charged with managing global affairs for the US Government. However, just as departmentalisation of large segments of public sector problem spaces is a form of complexity reduction, the same holds true for the internal structure of a single department or ministry. When conditions are fairly static (e.g. the absence of a large-scale conflict such as the Second World War or the rise of polarising adversaries during the Cold War), organisations like the State Department find themselves attempting to both reduce and absorb complexity, which moves them no closer to requisite variety. The key question in a static condition is: How does an organisation create an opportunity to transit the Ashby space toward requisite variety when there is no external stimulus to force action?

Working with relative precision

For many in the public sector, the fiduciary responsibilities that come with public office require a conservative approach to risk: with authority comes responsibility. This responsibility can be realised either through strict regulations on policy design and implementation, or tacitly through behavioural norms within institutions. In most areas, precision and certainty of evidence are understood to be a fundamental precursor to decision making. This is especially true for domains such as health care and education where the public expect positive outcomes, not experimentation and risk of failure. While it is certain that governments use evidence in their decision making, it is unclear whether the evidence fully informs policy or whether decision makers are able to comprehend evidence due to time, expertise, complexity or other constraints. The capture, analysis and transmission of evidence can also be a very time-consuming process. Political cycles and research cycles operate by very different clock speeds. Policy problems, especially certain social or environmental challenges, can be resistant to the formulation of comparable data. Moreover, evidence itself can be politicised – accepted by some as science and derided by others as fiction. These factors lead to a conflicted state: on the one hand, evidence is necessary; on the other, evidence may not be useful in a decision-making process.[8]

Enter then, wicked problems. As discussed above, wicked problems are emergent, meaning that they result from the interaction of smaller subsystems. Typically, science and evidence creation are most effective and precise at the level of the subsystem. For instance, the cognitive development of children can be well explained by neuroscience and psychology, but it is difficult to understand how learning emerges from the confluence of social, cultural, economic, environmental and biological factors. The problem that should concern policy makers the most – in this example, learning – is out of reach of the more narrowly defined domains of scientific inquiry. While some have begun calling for a second-order science approach to policy making, much work must be

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done to develop the field before it can be widely applied (see Hodgson and Leicester, 2016).

So, what can be done when facing a problem with no "definitive definition"? For designers and systems thinkers, the answer lies in their ability to work with relative precision. To overcome barriers stemming from uncertainty, it is necessary to comparatively appraise knowledge about a wicked problem. In practice, this means treating qualitative and quantitative data with equal rigour and by actively searching for – or inventing bridges between – the two. This process usually requires intuition and testing. The former, while perhaps an uncomfortable topic for many disciplines because of its apparent lack of seriousness, is in actuality a critical skill honed by experience and central to many designers' practice. In the context of strategy, intuition requires full investment of time and thought, so as to acquire a sense about how things fit together (Boyer, Cook and Steinberg 2011: 37). The latter, testing, is also dependent on intuition to the extent that it requires experience to know how to test ideas efficiently and productively.

Visualisation is also an effective tool for working with relative precision. In its most common form, visualisation is a sketch. Sketching allows the rapid transposition of ideas to paper, recording concepts while still allowing for addition, subtraction and interpretation. Precision can be increased or decreased in several ways. For instance, Figure 2.3 shows a collection of Picasso's famous "Bull" lithographs. On the left, he begins with fully developed drawings based upon a visually accurate portrait of a bull. On the right are rapid sketches that distil the essence of the bull to a few lines. Each lithograph effectively communicates the idea of a bull, but some allow for more interpretation than others. This interpretative space serves a purpose when confronting wicked problems. It allows for differing perspectives to enter a representation of an idea or analysis without relying on narrative, which itself can become so complex and circular so as to be disabling. Sketches and other forms of visualisation also preserve ideas so that they may be easily returned to over the course of work. Words on the other hand, unless carefully recorded, can be fleeting and lost during the process. Narrative can be difficult to re-contextualise, as anyone who has thought, "that seemed like such a good idea at the time" can attest.

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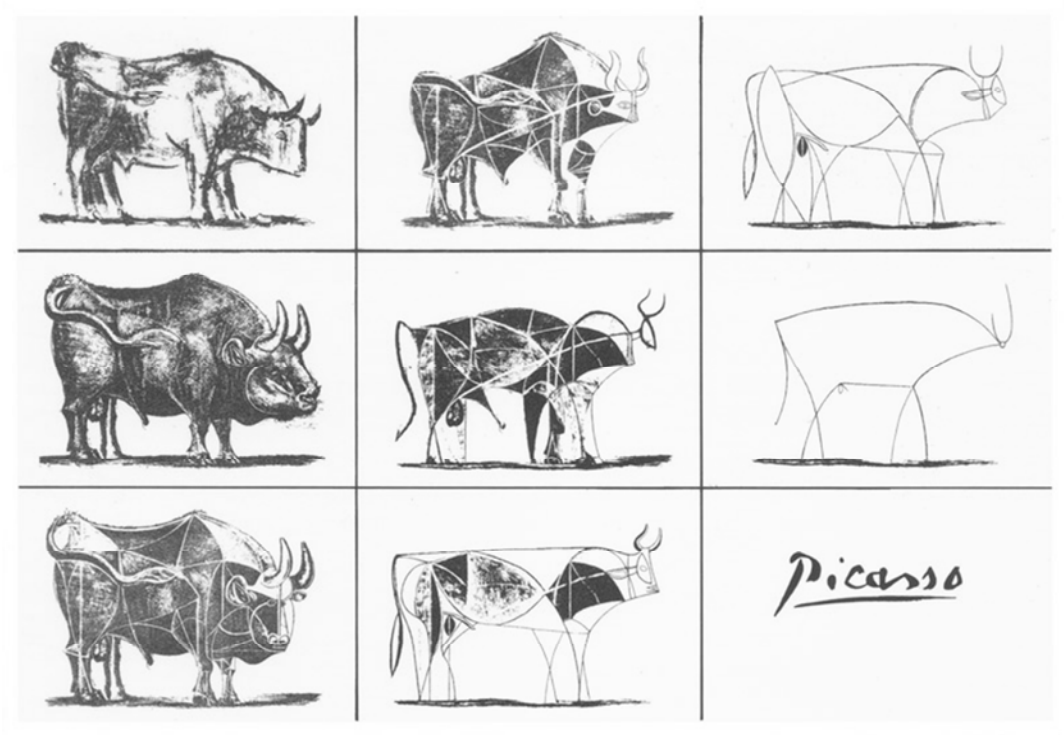
Figure 2.3. Picasso's "Bull" lithographs, 1945



Source: Picasso www.flickr.com/photos/sorarium/8578925321.

Working with relative precision also allows designers to propose solutions before all the facts are known. This pre-factual process is familiar to the practice of architecture, where designs for whole or parts of buildings, landscapes, infrastructures and so on are proposed well in advance of having fundamental information such as budget, location, occupancy and other constraints. In other disciplines, such as engineering, it is critical to have the most complete information possible before developing a solution in order to manage the risk of failure. This approach is productive when variables are known, but virtually impossible when working with wicked problems.

A pre-factual process enables an *open-ended solution* to be developed yielding at least two principal benefits. First, developing a solution early in the process creates a test case based in part on the unique problem being tackled rather than a generic theory. From this early prototype, greater understanding of the problem itself may be assembled. Second, because a solution was developed early and with the expectation that it will change, it can evolve radically as more information is gathered. Ideally, this results in solutions that are more robust and better tailored to their specific context.

Toward a systems transformation process

This section outlines a systems transformation process and draws on the authors' experience and case study research. Each subsection outlines in general terms the key elements of success. Greater specificity is highly dependent on the context, institutional capacity, problem, timeframe and resources available to public administrations as they embark on systems change. As discussed above, each wicked problem is essentially

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unique, which prohibits many one-to one comparisons between systems tactics. However, strategy and principles should be transferrable despite the contextual variance inherent in large-scale systems. Where possible, the report provides examples from the public sector to help illustrate how these principles can be applied. As these are necessarily short, please refer to the case studies in Chapter 3 for further analysis.

People and place

While the value of having good people working in supportive spaces may seem obvious, it is frequently overlooked as an indulgence, especially in the public sector. Yet these two variables – talent and workspace – are among the most important considerations of any highly successful start-up or established, innovative company. The same is true when applying systems approaches to complex problems.

Design is an inherently optimistic act and systems transformation in the public sector is ultimately concerned with improving people's lives. As such, it is critical to have a core team in place that is invested in both the change *and* betterment of a system.

The selection of individuals into teams should be done carefully. Having lateral thinkers and multiple disciplines present is important, but not as critical as their ability to maintain applied optimism. Systems change can be a slow, grinding process. Possessing optimism in the value and purpose of change helps to bridge the countervailing forces certain to emerge. That said, design and systems thinking rarely succeed with standard collaborative processes that can be completed during one-hour meeting slots. This is because wicked problems cannot be solved by a single discipline creating an optimum solution based on its tools and worldview. Multiple arenas of deep knowledge must be integrated, even when these seem contradictory. This synthesis across disciplines is possible when teams are able and willing to work inter-methodologically in an effort to find the best process fit for the topic at hand. Moreover, loose fits are common under uncertain conditions, but should not be feared or forced into greater conformity.

It is also useful to embed external expertise within a team for a fixed period. For instance, the Collaboratory at the US Department of State contracted a designer trained at the Rhode Island School of Design, in order to bring a new set of skills to help build out a new platform for collaboration. Similarly, members of the Strategy Unit at the Finnish Innovation Fund (SITRA) have joined the Prime Minister's Office and the Ministry of Economic Affairs and Employment for fixed terms to both introduce new ways of working and thinking into government, but also to improve SITRA's intelligence about how government operates. These "exchange programmes" help to expand ways of working and cultural norms and provide a space for new practices to emerge.

It must be recognised at the outset that, for some, systems transformation might equal loss, including employment, seniority or job satisfaction. Those that stand to lose should not be excluded, however, as they undoubtedly possess deep insights into the machinery of systems. In practice, this can translate into engaging those that stand to lose in a carefully managed process that allows them to redesign their roles within the new system.

Place is also important as it signifies the investment an institution is making in the process. Working in an isolated basement versus a public space closely connected to the heart of an organisation, or even a storefront rented in the city, sends two very different messages to those involved, including external stakeholders. Even when space is at a premium, seeing to their psychological and physical comforts can provide teams with a baseline sense of wellbeing that will help them overcome obstacles such as the frustration

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that is a normal by-product of ambiguity. It can be simple: remarkable effects can be realised when managers provide employees with access to decent coffee and good food. Google, Facebook and other companies learned this to their benefit long ago.

Working spaces must also enable dedicated, long-term collaboration. Given the complexity of systems approaches, it is not reasonable to expect to hold all relevant critical information in one's mind at all times. Pinning visualisations, artefacts, reports, images and so on to the walls of a workspace can spur new, connective thinking as a project unfolds.

Dwelling

Wicked problems often outstrip the ability to define them effectively. This mismatch between problem and definition sometimes arises from old concepts that have not been updated or recast to meet a changed landscape.

For instance, *civics* is a concept and practice central to the American understanding of a citizen's duties to the state. Today, civics is widely understood to be satisfied by voting. But in the past, the civic lives of Americans were much richer, connecting individuals to communities and communities to government. A search of the vast Google Books library using the Google NGram Viewer, which highlights the frequency in usage of words, shows that the term "civics" was actively used in the first half of the twentieth century, but began a precipitous decline in the 1960s. Since that time, the word appears at a much lower frequency, even after 9/11. This suggests that the idea of civics, which was once a foundational concept, has not been renewed for half a century. Meanwhile, technology, identity politics and structural changes have pushed Americans away from their government and one another.

The term "dwelling" means investing time to understand and articulate both the problem and the objective. Even in the context of discrete problems, it is easy to include significant biases or overly rely on tacit knowledge. To unpack the tacit dimensions of understanding and minimise bias, it is important to ensure that topics are sufficiently explored and that related issues are given more than a passing glance. This is especially true when working with complexity where some causal factors may not even be directly observable. Accounting for all sources of input, including those that are unspoken, may help reveal a more complete problem architecture.

Systems change and especially design processes often begin with a conversation about purpose. Defining the purpose of something helps to understand why it should exist and how best to achieve this aim. But for many central public institutions or constructs, purpose has gone undefined for decades. Take education for instance. When was the last time a country had a society-wide conversation about why and to what end it educates its children? Similarly, what is the purpose of health care: is it to extend life or improve wellbeing? Such questions cannot be answered without a debate on purpose. Time assigned to dwelling encourages this kind of searching and thinking. In a public sector context, using the term "dwelling" may generate alarm. Other phrases adapted from project management such as "phase zero" can be useful here.

In the language and practice of design, dwelling is often described as divergence or exploration. This phase is then followed by subsequent phases that consist of defining what has been learned, or convergence. The UK Design Council's famous *Double Diamond* diagram captures this notion well (Figure 2.4).

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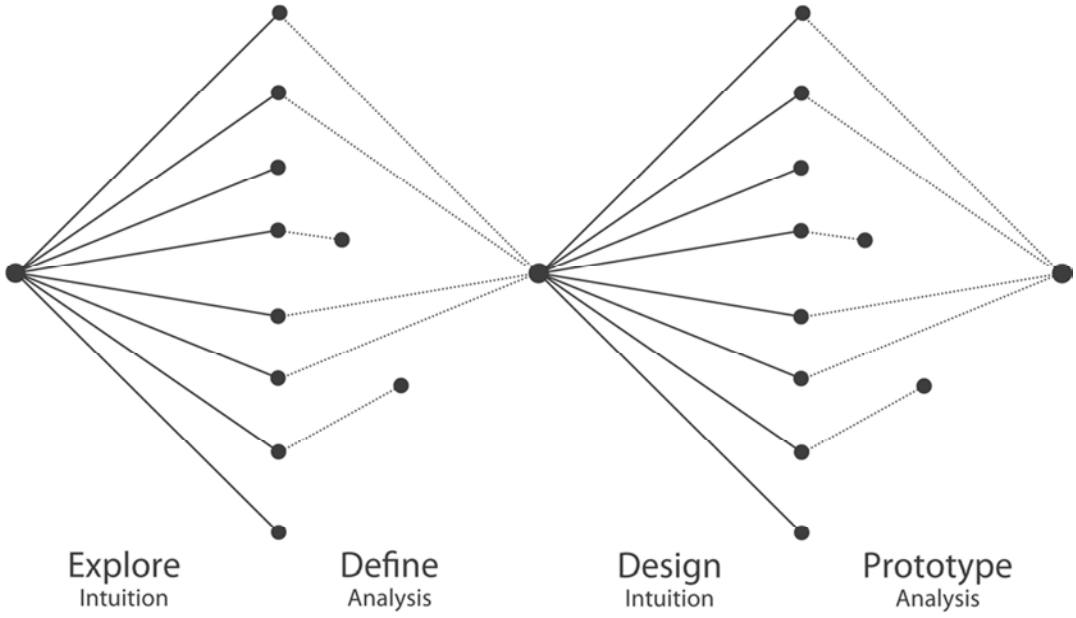
Figure 2.4. Double Diamond



Sources: Adapted from Helsinki Design Lab (2010) and UK Design Council.

Dwelling also suggests that alternate means of coping with information may be required. For example, storytelling, when combined with harder quantitative data, can be an effective tool for understanding complex systems. But to design an effective story, phenomena may have to be observed and analysed through multiple lenses. Models may have to be built to illuminate relationships and expose gaps. This takes time and resources and the willingness to dedicate them to an area of work that may not produce timely or obvious results. In this context, dwelling acts as a form of due diligence for complex systems that will pay dividends in later stages by accelerating the ability to make meaningful propositions.

In a public sector context, dwelling can be enabled through engagement processes where officials interact with citizens and other stakeholders to understand their lived experience (see the next section). The key is to spend time to align what is learned in the field with what are understood to be the limits and opportunities present in a system, in relation to a given problem. For instance, if an administration is interested in developing better services for aging populations, gathering more data from constituents will not be sufficient. These data must be made actionable by developing new principles, frameworks or logics from which interventions can be designed. Making information actionable requires the ability and resources to be *reflective* – another term for dwelling.

Connecting

To understand citizens, it is essential to get close to them; to see their lives, their desires, their fears and their successes through their lived experience. This action of *connecting* is itself extremely difficult, especially for governments, where institutional structures often thwart the ability to develop a holistic understanding of people and the issues they face. In order to connect, engagements with citizens must be meaningful, generative and respectful, and should not take the form of arms-length instruments such as surveys.[9] Connecting takes time and resources and makes use of tools such as

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videography that may not be readily available or familiar. Working with citizens in co-creative processes can be unpredictable and yield results contrary to an administration's perception of acceptable or desirable practice. Careful facilitation is also required. In the best cases, good facilitation destabilises authority and expertise, allowing controversial issues to be explored and captured more completely as citizens feel free to challenge political and business interests.[10]

The kind of knowledge generated by connecting with people is perhaps equally challenging, as it does not enjoy the same universality as quantitative knowledge. Centuries of parsing economic data has led to their extensive use in driving decision making. But what about less structured, qualitative data? The difficulties involved for decision makers in confronting a narrative, having strategic conversations, and then reaching unbiased decisions about policy and services, lead almost inevitably to the traditional approach of mild, distant citizen engagement.

However, the social science ethnography provides critical capabilities that allow researchers to work with qualitative data as rigorously as quantitative data. Ethnographic practices have gained traction and, indeed, have become central within many design and systems methodologies. While it is typically modified (i.e. simplified) from its stricter tenets in the academy, "ethnography light" can still be a rigorous observational and analytic practice. A deeper examination is unfortunately beyond the scope of this report.[11] However, when considering an ethnographic approach, it is critical to bear in mind that observation is not a passive process (Simpson, 2011). As one Brown University ethnographer said, "ethnography means making the strange familiar and the familiar strange",[12] indicating that in the act of observing, it is important to recognise the implications of the observer's presence and the role interpretation and bias will play in reaching conclusions.

In connecting with citizens, it is also critical to involve a diverse representation of the public. Without diversity, even the best co-creative processes can mirror standard engagement practices, which tend to bias proximal or known stakeholders. They can and should include individuals that may not have a direct stake in the process. Their disinterest can provide useful ballast to conclusions that are too easily reached.

For public service managers, connecting can be done with a variety of tools that exist on a spectrum from low proximity to high proximity. On the low side, questionnaires mailed or sent electronically can provide basic information from those who respond. On the high side, heavily facilitated co-creation processes can engage citizens on a much deeper level, raising the possibility (and risk, if not realised) of a deep sense of ownership and commitment to the outcomes. Engaging citizens in experimentation around public policy or programmatic solutions can be a middle ground. For instance, the Prime Minister's Office in Finland has developed a digital experimentation platform for citizens, following the outcome of a PMO project led by the think tank Demos Helsinki and the Finnish Environment Institute. The objective is to crowdsource useful ideas on ways to improve Finland, develop them into experimental proposals and scale the proposals if successful (see Figure 2.5 and the case study in Chapter 3) (Demos Helsinki, 2015a). This form of connecting engages citizens and gives them a sense of shared responsibility in the work and success of government.

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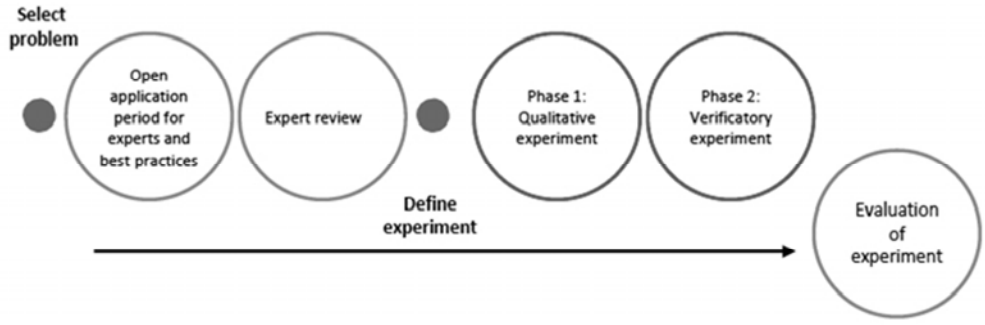
Figure 2.5. The experimentation process



Source: Demos Helsinki (2015b).

Framing

The problem with complex, systems challenges is that it is difficult to ascertain the exact *nature* of the problem. As noted earlier, there are no definitive definitions of wicked problems. So how can the problem be identified? More specifically, how can the problem be *framed* so that action may be taken?

Framing, or in the context of design, *problem framing* is a key method designers and systems thinkers use to unpick and ultimately work around dilemmas and paradoxes that have prevented change from occurring. A problem frame stakes out the territory in which action will be taken in order to achieve a desired outcome. Consider, for instance, a physics teacher that wants her students to gain greater proficiency in core scientific principles. One framing option is to design better exercises that cover principles more comprehensively. Another is to turn students into scientists so that they can discover principles directly through inquiry. Each approach is aimed at the same objective, but depending on how the problem is framed, either curriculum or pedagogy will be the focus of the solution.

Problem frames link the desired outcome with a definition of how a solution might be organised (the patterns of relationships between parts). It leaves out the specific elements that will be deployed, as these are determined after a problem frame appears promising (Dorst, 2015: 53). Framing is a dynamic process where multiple outcomes and solutions are explored as an understanding of the problem, outcome and context evolve and are refined. However, problem frames should be formulated with some attention paid to feasibility, especially within a highly regulated environment such as a public administration. If the desired outcome and possible approaches are not aligned with the capacity of an institution or collaborative body, it can become disruptive.

Hamel and Prahalad (1999) outlined a related concept for the management community in the *Harvard Business Review*. Their concept of *strategic intent* establishes a course of action based on the available methods and a desired outcome: "the goal of Strategic Intent is to fold the future back into the present … [W]hile clear about ends, it is flexible as to means." Within organisations, strategic intent provides a shared platform on which ideas can be explored and built into solutions while maintaining focus on overall objectives. For the design community, strategic intent can be blended with other objectives such as targeting specific populations or developing durable products.

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In his book *Frame Innovation*, Kees Dorst (2015) offers a useful, although demanding, nine-part "frame creation process model":

1. Archaeology: analyse the problem in depth as well as earlier attempts to solve it.
2. Paradox: investigate why the problem is hard to solve.
3. Context: explore key stakeholders of the problem and their environment, behaviours, etc.
4. Field: examine the broader landscape surrounding the problem.
5. Themes: analyse and articulate deeper factors at play in the field.
6. Frames: investigate implications of possible actions given themes and outcome.
7. Futures: "think forward" to see if the frame will lead to viable solutions.
8. Transformation: critically evaluate different solutions and their feasibility over time.
9. Integration: ensure frames and solutions can be well integrated into stakeholder organisations.

A lighter approach to problem framing is to ask a series of How Might We (HMW) questions. HMWs are a common tool used in design thinking methodologies within corporations and consultancies. The key is that the question avoids using phrases such as "how can we do this" where "can" implicates additional questions about risk, capacity or other challenges that can derail a framing process. As Tim Brown, CEO of IDEO, explained in the *Harvard Business Review*:

The "how" part assumes there are solutions out there – it provides creative confidence, "Might" says we can put ideas out there that might work or might not – either way, it's OK. And the "we" part says we're going to do it together and build on each other's ideas (Berger, 2012).

Balancing ambition and feasibility is important for HMW questions. For example, "how might we deliver more accessible digital services to seniors?" is likely to work better than "how might we improve the lives of seniors?"

Other approaches that share traits similar to framing include systems mapping and modelling, scenario planning, forecasting and design fiction, among others. The limitation of these methods is that they are biased towards what is or what should be, rather than how to get there.

Designing

Today there is no lack of vision in the world, but vision alone is hard to act on (Boyer, Cook and Steinberg, 2011).

It is impossible to give a full accounting of design, design practices and methodologies, as well as the diverse world of design cultures, within the space of a few paragraphs. However, there are a few useful concepts in the context of wicked problems and public administrations working towards better public services.

Design has two fundamental concerns: first, to order information into concepts, logics and rationales and, second, to create processes that produce useful outcomes.[13] Traditionally, this has meant working through a set of constraints provided by a client to

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identify an approach, develop a novel solution and then establish a fabrication process that will produce the desired outcome; say a chair or a tea cup. For a world of wicked problems, design is proving an essential tool for *specifying intentions* – a critically important capacity when it may be hard to understand what problem is actually causing the symptoms, let alone what must be done. Design has also always been operative at the intersection of intention and realisation, analysis and execution. It is a discipline constructed around the feedback loop between ideas held and actions taken. This makes it particularly well suited to function rigorously in ambiguous environments where precedents have little value.

How to begin a design process? First, see the sections above, then ask a few questions. Kees Dorst provides a simple equation (Dorst, 2015: 45) that has proven useful when facilitating teams of non-designers to solve complex problems:

WHAT + HOW = OUTCOME

Where WHAT refers to the constituent elements such as people and things, HOW refers to the patterns of relationships or connections between them. OUTCOME is the observed phenomena, the result of a process where the elements interact. In a typical deductive reasoning process where cause and effect are being determined, knowing the "what" and "how" allows the outcome to be predicted.

However, design processes change the knowns in the equation:

???? + ???? = OUTCOME

Here, something is known about the outcome (objective), but the elements and relationships are still to be determined. Dorst terms this equation "design abduction", in which "two unknowns lead to a process of creative exploration" (ibid.: 49). This concept is especially useful for complex challenges where it may only be possible to determine the desired outcome. The elements and how they fit together will then depend on a variety of other factors.

A discussion about desired outcomes is similar to defining a vision for an alternate future. In the author's experience, a positive vision for the future is a critical piece of infrastructure from which all other ideas, frameworks and solutions are hung. After framing an outcome/vision, it is important to describe the principles that will govern that alternate future. In most circumstances, the principles answer the "how" variable in Dorst's equation. For instance, when British colonists in the North American colonies created a vision for a future where government was "for the people and by the people", they also defined the principles that would guide decision making, such as a representative democracy and separation of powers. Taken together, vision and principles form the conceptual framework of a design for systems transformation process.

The next step is to determine solutions (the "what" in Dorst's equation) that can intervene in an extant system and move it towards the desired future. In an ideal scenario, a group of solutions (remember that there is no optimum solution to wicked problems) forms a portfolio that exceeds the sum of its parts because of the synergistic nature of the solutions working together on a systemic challenge. The portfolio functions as a kind of systems acupuncture.

It should be pointed out that the term *solutions* should be used carefully in the context of systems change. Solutions have neat boundaries in terms of time and scope and interact with systems in predictable ways. Interventions (the authors' preferred term) are different in that they are designed with the system in mind. They anticipate a reaction by the

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system and are positioned to constructively incorporate the reaction while still working toward original objectives. Fundamentally, solutions are finite, while interventions more open ended and adaptable.

Prototyping

Today, prototyping (experimenting) is a well-understood concept in the product design and technology industry. However, prototyping approaches are increasingly being used in the public sector[14] and innovation labs in higher education,[15] as well as other sectors. Prototyping involves early-stage testing of ideas, well before a final product is fully conceived. The process seeks to answer questions that cannot be uncovered through further analysis or deduction. Typically, only portions of solutions are tested to establish how an idea will perform according to certain factors. In design and construction, for instance, this often involves building a portion of a building's facade at scale on or near the site to test how it performs according to local environmental factors.

According to NESTA:

> *Prototyping can be applied in the same way to public services. Prototyping of public services might be a way of testing early-stage ideas with service users to help choose between alternatives. It can also be used to think through key aspects of how a service would run and test it with people. Prototyping is a flexible methodology; it can be used to develop new services or improve existing services. It can be applied to the development of simple or more complex services and, depending on the level of depth required, it can be low-cost and quick or it can be more complex and take longer (NESTA, 2011, 6).*

Public sector examples of prototyping include temporary new bus routes in cities where new services are needed, but true demand cannot be reliably gauged. In person-to-person service scenarios, prototypes can test new environmental conditions, such as service centre design and barriers (or lack thereof) between citizens and front line workers. Interactions can also be prototyped through role playing to test the length, content, tone, usefulness and so on, of customer engagements. This helps bring the citizen closer to the process and ensures that public services are meaningful to them, as opposed to most efficient for the administration.

The value of a prototyping process is typically worth the additional cost, as it ultimately reduces the final risk of failure. In the context of systems change, prototyping serves another function, which is to help produce greater insights about the nature of the problem itself and to build confidence among stakeholders that impactful solutions are being developed. When engaged in work that is without precedent and where ambiguity reigns, the only way to gather evidence may be to test an idea empirically. Prototyping ultimately leads to better services that have been developed at lower risk and with the buy-in of key stakeholders (ibid.: 15-16).

It is important to remember that prototyping can be conducted without significant resources. It can be both low risk and low cost. In the public sector, experimentation budgets are rare and procurement rules can slow momentum. The best solution may be to just build and test an idea, even if the execution is imperfect. A "hacker's" ethos can help drive work forward, even when institutions prove too rigid.

On a practical note, it is also important to document evidence when prototyping. Not only does this make feedback loops more useful, it also provides evidence for current and future stakeholders about the value of an initiative. Evidence generated from prototypes

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can be used to gauge risks associated with scaling up or investing in further refinement, such as when deciding whether or not to proceed with a pilot phase.

Stewarding

Helsinki Design Lab describes stewardship – with respect to systems change – as "the art of getting things done amidst a complex and dynamic context. Stewardship is a core ability for agents of change when many minds are involved in conceiving a course of action, and many hands in accomplishing it" (Boyer, Cook and Steinberg, 2013: 7). Stewardship is what happens after an implementation phase begins. It is not *execution* nor is it *neutral* (ibid.: 15). It differs from many traditional project management techniques in that it opens up opportunities to change directions, both tactical and strategic, once work has begun and new information about the system or problem becomes available. The core premise of stewardship rests on the notion that solutions, in the context of wicked problems, are never optimal. Rather, solutions should be understood to be interventions into a system to which the system will react, requiring adjustment on the part of the intervention in order to achieve impact. The best public service designers work to minimise negative or unexpected system reactions, employing techniques such as human-centred design and co-creation to ensure that the system will be receptive to the intervention and that, to some degree, it is a response to demand that is either expressed or latent. But even well-designed interventions will require adjustment: stewardship collapses the gap between analysis and execution common in policy spheres.

Stewardship can also be understood as a form of agile leadership during a project phase that is often viewed as not requiring significant decision making (i.e. "we figure out what to do, then we do it"). It involves continuous calibration between evolving contextual realities and desired outcomes. It is similar to the notion of strategic intent (discussed earlier) in that *folding the future back into the present* requires a constant, robust connection between objectives, methods and systems dynamics.

This requires several modifications to traditional approaches. First, resources must be distributed differently. Typical public sector procurement approaches are aimed at ensuring that deliverables match specifications decided well before the work begins. In a command and control environment, this makes sense. But in the context of wicked or systemic problems, the outcome, by definition, cannot be predetermined. There is no "theory of change" before the project begins. The theory is based on developing an understanding of the problem and the system(s) in which the problem is situated. Resourcing therefore needs to be more carefully balanced across all project phases, ideally allowing the project team to take advantage of new opportunities as they emerge, or unsuccessful paths are closed. When working opportunistically it is of course important to pay careful attention to scope creep through active vigilance. This need not take the form of a heavy reporting regime, but a regular check is necessary to ensure that work is developing according to expectations. Architecture offices have a tradition of asking each project team to present their work at the end of each week to the whole office. This tradition not only provides the team with an opportunity to demonstrate leadership and ensure the project is meeting the office's and client's objectives, it also creates a productive, dialogic atmosphere among rank and file employees. Even physicians have a similar process called Morbidity and Mortality meetings (or M&Ms) where they discuss practices, policies, errors and successes, so as to ensure progress, despite a context defined mostly by unique transactions.

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Second, authority must be distributed differently. In a typical command and control or analyse-then-execute process, decision-making authority resides in the initial scoping and resourcing decisions. Implementation in this context, by definition, should not require further decision making that exceeds the scope or initial framing. Stewardship, however, necessitates the authority to continue making decisions as the project develops. In other words, authority is distributed across all project phases, rather than being front-loaded. This is because (as explored above), the problem cannot be fully understood prior to the intervention. In fact, the problem may never succumb to full analysis if it is a wicked problem. This fundamentally challenges an approach where analysis is expected to reveal the full scope of issues to be addressed, leaving only decisions about how to address them and the necessary resources required.

Third, timelines (and therefore processes) are unpredictable and should be as open ended as possible. This is especially challenging in the public sector for a multitude of reasons, not least of which is the apparent inefficiency that open-endedness might suggest. It is much easier and acceptable to begin and complete a programme on time and on budget, even if the programme does not actually improve the situation. But systems change takes time and is unpredictable, and processes must accommodate long timeframes and the ability to adjust to meet new demands. Stewardship is the practice of managing this unpredictability.

Finally, stewardship arises naturally out of any truly collaborative process. Why? Because collaboration always carries some kind of cost that is generally a product of the mismatch between different organisational cultures, norms, policies and even professional languages. This cost introduces the possibility of needing to change directions, rethink assumptions or allocate resources differently. The adaptive approaches to resourcing, authority, timeframes and process that are present in a steward's toolkit make meaningful collaboration possible.

One example of stewardship in practice (among others) is explored in the book *Legible Practises* (Boyer, Cook and Steinberg, 2013) in the context of the United Kingdom's Government Digital Services (GDS) programme. The concept of "public beta" builds on an idea borrowed from the tech sector but applied to public services. Technology companies often release products in *beta* mode before they are considered complete. For instance, Google's Gmail platform famously operated in beta for more than five years during which time it gained more than 100 million users (Lapidos, 2009). A similar idea operates in the public sector: "make services available to the public before they are fully refined and use this beta period as a way of collecting feedback to further refine the project" (Boyer, Cook and Steinberg, 2013: 128). GOV.UK, was launched by GDS in beta mode, in order to create interest, buy-in and feedback from the public. Attaching the idea and even the label "beta" to the product signalled to the public that GOV.UK was a work in progress with a built-in process for improvement. In addition to the aspects of stewardship outlined above, a public beta period also requires a different tolerance (and system to receive feedback) for scrutiny by critics, and therefore courage on the part of public managers. As Laura Bunt notes in her NESTA blog on the topic: "beta indicates a culture of continuous improvement. Trial and error, learning and adapting – principles inherent in this stage of usability testing – are important in ensuring that services adapt to our changing needs and expectations."[16]

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Evaluating

Experience suggests that evaluating systems transformation efforts can be a fraught exercise. Systems normally change over long timescales, and change in unpredictable ways. In the course of the upheaval, causalities can easily be lost. In the drive to measure impact in every facet of society, consideration should be given to propriety and the value of trying to measure what may not actually be measureable.

This is not to say that developing an evidence base is not important. Evidence is critical to many aspects of systems change work, not to mention its value in ensuring that the public interest is being served. But evaluation should be carefully designed so as to have a minimal impact on the work itself. As Christopher Wren, the architect of St. Paul's Cathedral in London placed on his epitaph in the crypt: "Reader, if you seek his monument – look around you".

In the public sector context, this might mean working with stakeholders throughout a project to co-develop a set of measures or performance metrics that are project-specific and measured during and well after an implementation/stewardship phase. This will require trust and resourcing at the outset of a project to distribute evaluation authority to project teams. It might also mean waiting for months or years after a project has been completed before gathering data. Longitudinal analysis might become the new norm for public administrations working on complex challenges. This will require new means of gathering, storing, analysing and eventually sense making. Some organisations working on issues that cross traditional government structures have started to discuss the need for systems-based and "readiness for change" metrics (see Box 2.2).

Box 2.2. The search for meaningful measurement in the Early Intervention Foundation

The United Kingdom's What Works Centre for Early Intervention[17] is exploring the typologies of components and degrees of multi-agency systems that are most effective in securing early intervention for vulnerable children and families. Although published evidence on the impact of multi-agency systems is limited, there is demand at both the national and local level to identify the elements of systems that are most effective, and to build an evidence base on which future systems can be designed and implemented.

Key issues which the Early Intervention Foundation is exploring with government and local transformation leaders include: the weakness of traditional evaluation methodologies for complex and changing systems; the need for a common set of terms and metrics to classify and compare children's systems; the importance of "readiness for change" with regard to implementation and delivery of outcomes; the need for tools to aid system design and evaluation; and the importance of national leadership, guidance and support for local systems to be more effective.

Moreover, given that evidence might be unstructured, originate from non-traditional sources or be gathered via opportunistic means, analysis tools will need to be adaptable. They will also need to have equal facility with both quantitative and qualitative data, for instance, and perhaps find expression through narrative or film as opposed to spreadsheets. But more importantly, decision makers and managers will have to exercise leadership as they work with the uncertainty inherent in this kind of ambiguous information landscape. They may face additional scrutiny as the public sector (along with other fields)[18] transitions toward better use of second and third-order evidence.

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The present relationship with evidence may well become more fluid. But perhaps certainty was never as certain as believed. One only needs to think back to the global financial crisis to see the pitfalls of "evidence" and certainty. As J.L. Austin wrote in *Sense and Sensibilia* (1962):

> *The situation in which I would properly be said to have evidence for the statement that some animal is a pig is that, for example, in which the beast itself is not actually on view, but I can see plenty of pig-like marks on the ground outside its retreat. If I find a few buckets of pig-food, that's a bit more evidence, and the noises and the smell may provide better evidence still. But if the animal then emerges and stands there plainly in view, there is no longer any question of collecting evidence; its coming into view doesn't provide me with more evidence that it's a pig, I can now just see that it is.*

Notes

1 See, for example, the wealth of resources on public services available from the Design Council website: www.designcouncil.org.uk/resources/search/im_field_objective/public-services-486.

2 For example, see the materials available from: http://social-labs.com/toolkits.

3 This is largely attributed to David Kelley and IDEO Design (see Kelley and VanPatter, 2005).

4 Buchanan (2001) defines the four orders of design as symbols, things, actions and thoughts, with the corresponding design areas of graphic design, industrial design, interaction design and environmental design.

5 In the context of social innovation, see Brown and Wyatt (2010).

6 See the discussion in Dunne and Martin (2006).

7 In 1956, the cybernetician W. Ross Ashby published *An Introduction to Cybernetics* in which he described the internal order of a system as a response to the environmental or external forces it faces. His Law of Requisite Variety stated "only variety can destroy variety" (Ashby, 1956: 207), which was later rephrased by Stafford Beer as the more well-known phrase "variety absorbs variety". Both Ashby and Beer were describing a state of dynamic stability wherein systems can only control input (perturbations) to the extent that they have sufficient internal variety to react. For example, in order to make a choice between two competing alternatives A and B, the decider must be able to accept or become either A or B in order to choose one of the possibilities (see http://pespmc1.vub.ac.be/REQVAR.html).

8 See the Alliance for Useful Evidence: www.alliance4usefulevidence.org.

9 For example, the Centre for Ageing Better in the UK has worked together with diverse neighbourhoods within Greater Manchester on the complex problem of "worklessness". Each area has its own distinct demographic, geography, culture and

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pre-existing assets that require consideration. Using co-design, the centre brings together local providers and residents within a space where they can openly share their views and ideas on the growing challenge.

10 See Helsinki Design Lab's (2013) writing on Hybrid Forums.

11 Ethnography has many variations including Hybrid Forums (see Callon, Lascoumes and Barthe, 2009). See also the vast sphere of co-creative processes aimed at connecting authentically to citizens.

12 Sarah Besky, lecture at RISD Institute for Design and Public Policy, 2016.

13 "Useful" is broadly defined here to mean anything from economic value to delight.

14 See Nesta (2011) for an in-depth analysis of the topic.

15 For instance, the Stanford D School.

16 More from Laura Bunt at NESTA can be found here: www.nesta.org.uk/blog/designing-beta-public-service-finding-courage-be-imperfect.

17 The What Works Centre for Wellbeing is a cross-sector approach to improving wellbeing working with national, devolved and local government, voluntary charities and the social enterprise sector and business.

18 For example, systems biology, systems medicine, phenotypes and Bayesian studies (such as clinical trials).

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References

Ackoff, R.L. (1981), *Creating the Corporate Future: Plan or be Planned for*. Wiley & Sons, New York.

Argyris, C. and D.A. Schön (1978), *Organizational Learning: A Theory of Action Perspective* (Vol. 173). Addison-Wesley, Reading, MA.

Austin, J.L. (1962), *Sense and Sensibilia* (ed. G.J. Warnock). Oxford, Oxford University Press, Oxford, UK.

Ashby, W.R. (1956), An Introduction to Cybernetics. Chapman and Hall, London.

Berger, W. (2012), "The secret phrase top innovators use", *Harvard Business News*, 17 September 2012, https://hbr.org/2012/09/the-secret-phrase-top-innovato.

Boisot, M. and B. McKelvey (2011), "Connectivity, extremes, and adaptation: A power-law perspective of organizational effectiveness", *Journal of Management Inquiry*, Vol. 20, No. 2, pp. 119-133.

Boyer, B., J. Cook and M. Steinberg (2013), *Legible Practises: Six Stories About the Craft of Stewardship*. SITRA, http://helsinkidesignlab.org/legiblepractises.

Brown, T. (2008), "Design thinking", *Harvard Business Review*, Vol. 86/6, p. 84.

Brown, T. and J. Wyatt (2010), "Design thinking for social innovation", *Stanford Social Innovation Review*, Winter 2010, www.ssireview.org/articles/entry/design_thinking_for_social_innovation.

Buchanan, R. (2001), "Design research and the new learning", *Design issues*, Vol. 17/4, pp. 3-23.

Callon, M., P. Lascoumes and Y. Barthe (2009), *Acting in an Uncertain World*. MIT Press, Cambridge, MA.

Casti, J. (2012), X-Events: Complexity Overload and the Collapse of Everything. William Morrow, New York.

CoLab (2016), *Follow the Rabbit: A Field Guide to Systemic Design*. Government of Alberta, Edmonton, Canada, https://drive.google.com/file/d/0B0KwcwVigAntYm00Tzl4WnZTX0k/view.

Cooper, R., S. Junginger and T. Lockwood (2009), "Design thinking and design management: A research and practice perspective", *Design Management Review*, Vol. 20/2, pp. 46-55.

Demos Helsinki (2015a), "This is why Helsinki is able to implement the basic income experiment", 8 December 2015, Demos Helsinki, www.demoshelsinki.fi/en/2015/12/08/this-is-why-finland-is-able-to-implement-the-basic-income-experiment.

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Created from aalto-ebooks on 2017-12-04 22:03:03.

Demos Helsinki (2015b), *Design for Government: Human-centric Governance Through Experiments*, Government's Analysis, Assessment and Research Activities, www.demoshelsinki.fi/wp-content/uploads/2015/09/Design-for-Government-%E2%80%93-Governance-through-experiments.pdf.

Dorst, K. (2015), *Frame Innovation: Create New Thinking by Design*. MIT Press, Cambridge.

Dorst, K. and L. Royakkers (2006), "The design analogy: A model for moral problem solving", *Design Studies*, Vol. 27/6, pp. 633-656.

Dunne, D. and R. Martin (2006), "Design thinking and how it will change management education: An interview and discussion", *Academy of Management Learning and Education*, Vol. 5/4, pp. 512-523.

Gharajedaghi, J. (2011), Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture. Morgan Kaufmann, Burlington, MA.

Helsinki Design Labs (2013), *Hybrid Forums for Urban Controversies: the Ten Commandments.* Helsinki Design Labs, Helsinki, www.helsinkidesignlab.org/blog/hybrid-forums-for-urban-controversies-the-ten-commandments.

Hodgson, A. and G. Leicester (2016), *Second-Order Science and Policy: An Account of the Exploratory Forum*, SITRA/IFF, Helsinki, www.decisionintegrity.co.uk/SOSP%20Report%20Final%20June%202016.pdf.

Ito, J. (2016), "Design and science", *Journal of Design and Science,* http://jods.mitpress.mit.edu/pub/designandscience.

Junginger, S. (2014), "Human-centered design: Integrating systems & services around people by providing a common ground for action", in L. Freund and W. Cellary (eds.), *Advances in the Human Side of Service Engineering*. AHFE Conference, Danvers, MA.

Kelley, D. and G. VanPatter (2005), *Design as Glue: Understanding the Stanford D-school*. NextDesign Leadership Institute, New York.

Lapidos, J. (2009), Why did It take Google so long to take Gmail Out of 'beta'?", *Slate*, 7 July 2009, www.slate.com/articles/news_and_politics/recycled/2009/07/why_did_it_take_google_so_long_to_take_gmail_out_of_beta.html.

Li, M. (2002), "Fostering design culture through cultivating the user-designers' design thinking and systems thinking", *Systemic Practice and Action Research*, Vol. 15/5, pp. 385-410.

Martin, R. (2009), The Design of Business: Why Design Thinking is the Next Competitive Advantage. Harvard Business Press, Boston, MA.

McKelvey, B. and M. Boisot (2009), "Redefining strategic foresight: 'Fast' and 'far' sight via complexity science", in L.A. Costanzo and R.B. MacKay (eds), *Handbook of Research on Strategy and Foresight*. Edward Elgar, Cheltenham, UK, pp. 15-47.

Mulgan, G. (2014), Design in Public and Social Innovation: What Works and What Could Work Better. NESTA, London, www.nesta.org.uk/sites/default/files/design_what_works_what_could_work_better.pdf

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Created from aalto-ebooks on 2017-12-04 22:03:03.

Puttick, R., P. Baeck and P. Colligan (2014), *i-teams; The Teams and Funds Making Innovation Happen in Governments Around the World*. NESTA, London, http://theiteams.org/system/files_force/i-teams_June%202014.pdf.

NESTA (2011), *Prototyping Public Services*, NESTA, London, www.nesta.org.uk/sites/default/files/prototyping_public_services.pdf.

Rowe, P.G. (1987), *Design Thinking MIT Press*. Cambridge, MA.

Simpson, I. (2011), "Ethnography: Caught between myths", *Research Live*, 25 February 2011, www.research-live.com/article/opinion/ethnography-caught-between-myths/id/4004640.

Smith, H. (2015), "People are still living in FEMA's toxic Katrina trailers — and they likely have no idea", *Grist,* 27 August 2015, http://grist.org/politics/people-are-still-living-in-femas-toxic-katrina-trailers-and-they-likely-have-no-idea.

Tõnurist, P., R. Kattel and V. Lember (2015), "Discovering innovation labs in the public sector", *The Other Canon and Tallinn University Working Papers in Technology Governance and Economic Dynamics*, Vol. 61, June, https://pdfs.semanticscholar.org/adc5/021cb863d386401f5b8221185ad565beb89b.pdf.

Wastell, D. (2010), "Managing as designing: 'opportunity knocks' for the IS field?", *European Journal of Information Systems*, Vol. 19/4, pp. 422-431.

Further reading

Donahue, A. and R. Tuohy (2006), "Lessons we don't learn: A study of the lessons of disasters, why we repeat them, and how we can learn them", *Homeland Security Affairs*, Vol. 2/2.

Vickers, G. (1970), *Freedom in a Rocking Boat*. Penguin Books, London.

Von Foerster, H. (2003), "Ethics and second-order cybernetics", in *Understanding Understanding*. Springer, New York, pp. 287-304.

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Chapter 3.

System approaches in practice: Case studies

This chapter provides an in-depth examination of four systemic change case studies from diverging contexts. It analyses how systems approaches have been applied in practice to: prevent domestic violence (Iceland), protect children (the Netherlands), regulate the sharing economy (Canada) and design a policy framework for conducting experiments in government (Finland). The case studies provide an overview of the context of the change process, steps to initiate and carry out systems change, and its impacts. The chapter highlights the complexity in terms of problems examined and government levels involved, and the difficulties of working across silos. The cases show that systems approaches can be very beneficial in redefining government outcomes and structuring change, but that transformation also requires various resources, such as flexible finances, time, political coverage, systems thinking capabilities, and independent brokers. The empirical examination also reveals the ongoing need of systems thinking and iterative processes as implementing systems change invariably unearths unforeseen effects, system barriers highlighting the need for meaningful measurement of outcome-oriented change.

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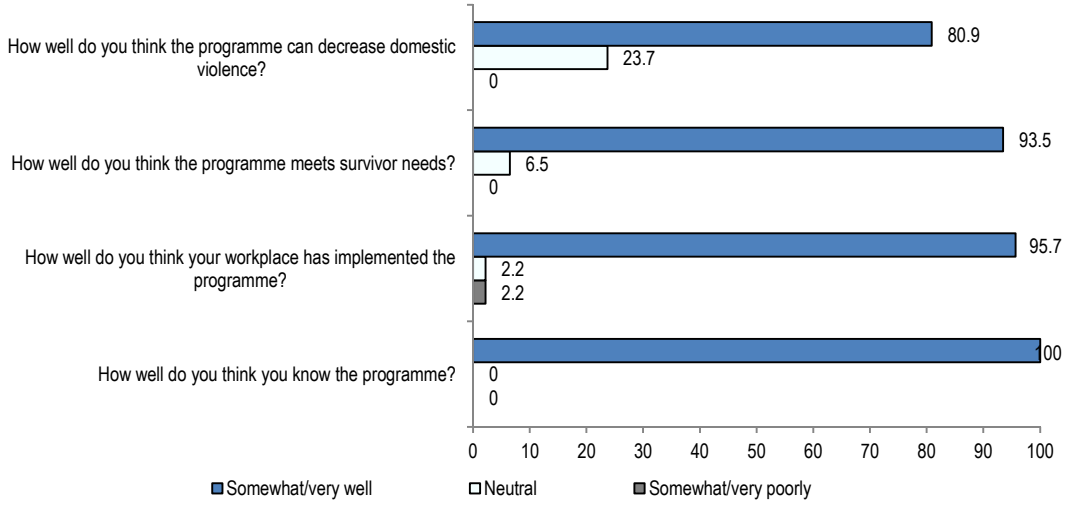
Figure 3.2. Together Against Domestic Violence evaluation



Source: Sigurvinsdóttir (2016).

Work continues in Iceland to combat domestic violence at a systemic level. In 2014, the total number of domestic disturbances cases was 799 (both disputes and domestic violence), while the number of reported domestic violence cases was 294. In 2015, the total number of domestic disturbances cases rose to 1 213, the number of disputes cases was 606 cases, and the number of domestic violence cases was 607. These statistics represent an enormous increase in reporting of domestic violence cases. The effect of systemic changes on addressing domestic violence continues to be monitored, with a view to providing a better assessment of the contribution of systems change to preventing domestic violence and providing effective support to victims.

Using system approaches in policy design: introducing experimental culture as a high-level political goal (Finland)

Summary

In 2015, Finland started to develop a new framework for experimental policy design. Together with Demos Helsinki, a Nordic think tank, the Prime Minister's Office (PMO) of Finland employed a combined systems and design thinking approach in order to develop a new policy framework to carry out experiments in government. In parallel, key figures of the ruling Centre Party were involved with developing and spreading the idea of "experimental culture" in the Parliament of Finland. As a result, experimentation was incorporated into the strategic government programme ("Finland, a land of Solutions") in May 2015 and an experimental policy design programme was set up. The new approach to policy design allowed both broader "strategic experiments" (formalised policy trials) – for example, the ongoing basic income experiment – and a grassroots experiment designed to build up an "experimental culture" in the public sector in Finland. In addition to the original six strategic experiments introduced by the government, hundreds of experiments and policy pilots are emerging across the country both at the central government and municipal level. In 2017, the Finnish government is launching a digital

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platform called *Kokeilun Paikka*[4] (Place to Experiment) to support the government's key goal: finding innovative ways to develop public services.

Context

Finland has engaged in the debate on systems change in government as part of its Governments for the Future (2012-2014) project. The project was launched by the Ministry of Finance and the Prime Minister's Office in partnership with SITRA (the fund for innovation operating directly under the Finnish Parliament) to discover new ways to execute significant state administration reforms.

In 2012, the Committee of the Future in the Parliament held hearings regarding new methods of steering and strategy for the country. One participant noted that, "there was a general feeling in the parliament that they were far removed from what was going on – there were a lot of discussions, but very little action". One topic presented at the committee, "experimental culture" – based on sustainability and environmental experiments – provoked a lot of interest across party lines. In response, the committee commissioned a special report, *Kokeilun paikka! Suomi matkalla kohti kokeiluyhteiskuntaa* ("Time to Experiment! Finland on its way to the Experimental Society") (Berg, 2013), which argued for rapid iteration, grassroots experiments and a strategic outlook focused on experimentation in government. The report also suggested the creation of an office or ombudsman for experimentation and public sector innovation. Juha Sipilä, who in 2015 became Prime Minister of Finland, was then a parliamentarian and heavily involved in the work as a member of the committee. This process created initial political buy-in for experimentation in government, and it was especially fortuitous that the future Prime Minister was directly involved in the work. As one commentator noted, "I don't know if the approach would have been promoted at the PMO's level at such a pace if they [hadn't] made it their theme to promote". As the idea took root, several other reports on experimentation in public policy were published in Finland (e.g. Berg et al., 2014).

In parallel, the government initiated the OHRA Project (2014) – a steering framework – to prepare recommendations for the next parliamentary term after the elections in the first quarter of 2015, in order to improve the impact and effectiveness of government actions. The OHRA activities identified the horizontal nature of many new policy problems, the lack of an evidence base in policy making, and the gap in the feedback loop within the policy-making system from policy implementation to policy design. Finland was seen as a "legalistic society" where regulation was used as the main vehicle of change. As one observer noted: "Lawyers and social scientists do not come together in our policy-making system, the collaboration is not deep enough. Thus, there are little alternatives to legislation." More flexible forms of problem solving were therefore deemed necessary. The OHRA project also recommended that the government programme become more strategic. The final report proposed that a major part of the research funding supporting government decision making (the so-called TEAS function)[5] should be allocated to the needs of the Government Action Plan (ibid.). The resources for the Experimental Finland team and its activities were allotted from the government's research and assessment team's budget, both of which form part of the Prime Minister's Office's share of the state budget. By the end of the process there was a high level of consensus regarding how to develop the policy-making process in Finland.

This was the context in which the PMO began to look for new tools to improve the government's steering framework. The Office was especially interested in the upcoming

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fields of behavioural insights, experimentation and evidence-based policy making. Thus, the PMO drafted a tender focusing on ways to implement these fields. Two different theoretical sources were merged for the experimental policy design programme: behavioural economics-based thinking (e.g. randomised control trials (RCTs) and the Behavioural Insights Team (BIT) experience from the UK); and the rapid process of experimentation/iteration found in lean start-up thinking, which draws on business experience. As a result, the programme had two different ideas built into it: top-down thinking (RCTs, etc.) and bottom-up thinking (iterative, grassroots-level development work). This approach resulted later in the division of experiments, with large policy trials (formalised RCTs) separated from smaller, bottom-up and intuitive ways of conducting experiments. These different levels of experiments are described here separately to create an understanding of the many levels of experiments and their respective value within the experimental "ecosystem".

Demos Helsinki – a Nordic think tank[6] – focused its proposal on strategic change, won the tender and started work on the framework in early 2015. They proposed a more practical approach, shying away from solely theoretical approaches. Their methodology combined the "traditional literature review" with a co-creation process, the ultimate purpose of which was to produce useful insights that could feed into the government's agenda.

Initiating a process of systems change

Demos Helsinki started their work with a brief of complex topics from the PMO: behavioural insights, evidence-based policy making and experimentation. The government research plan for 2014 identified a key study objective of outlining new policy instruments and support for a culture of experimentation. The PMO wanted to know which experiences had been gained by countries applying a behavioural and experimental approach to policy guidance and what lessons could be learned with a view to developing policy instruments for the government.[7] No single framework existed that took into account all the aforementioned points. Furthermore, the exact nature of the government's demands was unclear. Nevertheless, Demos Helsinki saw a possibility under the initial auspice of behavioural insights to create an opening for feedback mechanisms that would allow for more flexible decision making – an overall new steering framework: "It was not about how good of a report we could write, but the aim was to change the culture/habits of public administration, introduce new methods, decentralize and emancipate citizens." Thus, they aimed to create a framework to test new approaches to policy design and concentrate on the "iterative nature of policy making".

As Demos Helsinki's work did not centre particularly on behavioural insights, they considered all methods, tools and resources (co-creation, etc.) that could steer behaviour and create a "new way of policy making" for a more resilient society. The idea was to create a "Nordic model", which would give power to the citizens. After further work, a "Finnish model" emerged.

Demos Helsinki struggled with the agenda as it was initially defined and, as a result, the project had to be reframed. The initial brief emphasised human-centeredness and behavioural insights, but the goal and research questions were quite broad and allowed for an open approach. Behavioural insights were seen as too complex and general, and did not allow Demos Helsinki to focus. Hence, a strategic choice was made to centre on experimentation. However, the team tried to retain a broader view and "not to love the method too much". Furthermore, experiments (or pilots) were seen as "more understandable" to the general public (denoting broader citizen engagement), which was

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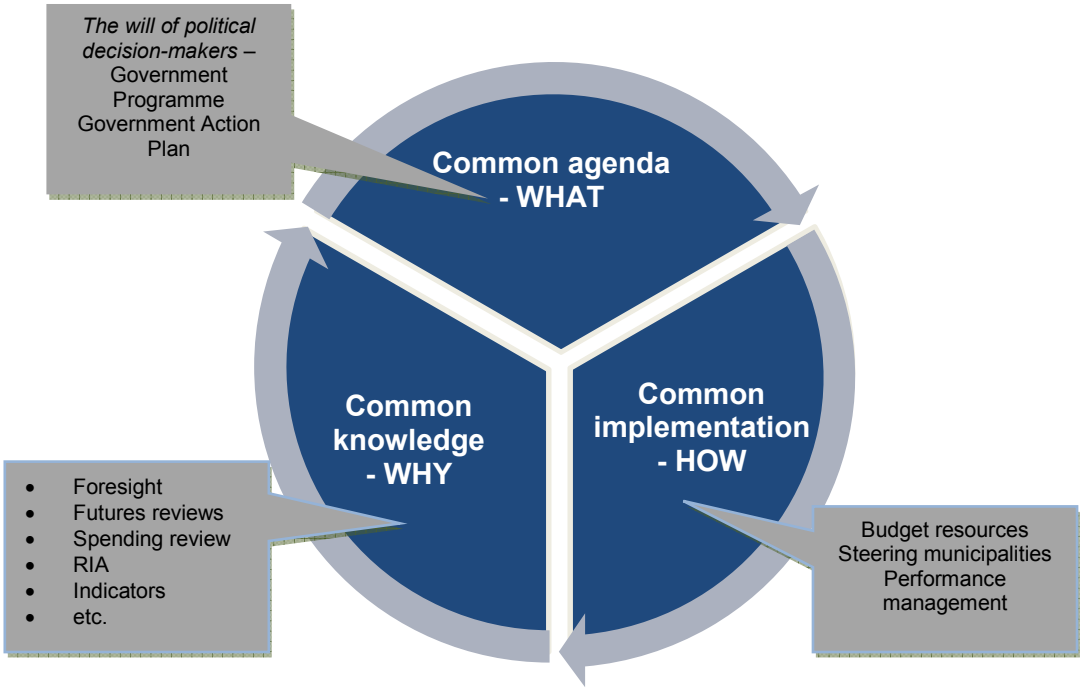
especially important at the time because Finland was approaching general elections. Thus, while the project started with a strong emphasis on behavioural insights and evidence-based policy design, it culminated with a framework based on experimental policy design.

To arrive at a framework that the public sector could apply, Demos Helsinki adopted a multi-method approach. They carried out an initial review of relevant practices, then interviewed experts from the public, private and third sector; next, they created a community around experimentation, then moved to obtain international validation for the report. Demos Helsinki applied a loose systems design approach to analysing the problem and pulled together different sources to design the experimentation process.

The team first carried out a review of relevant literature in the field including existing benchmark OECD, NESTA and SITRA documents.[8] "We didn't want to come up with something new – just take the findings into the Finnish context." After analysing the working methods of top innovation organisations in the public sector (e.g. Mindlab, BIT, Kennisland, What Works Centre for Aging Better, Policy Lab UK, etc.), the team arrived at the conclusion that the feedback loop in most of these cases was fragmented. Final feedback from the implementation phase did not reach the policy design phase: there was a gap in the process. As one observer noted, "There is no self-evident link in social and health services between implementation and policy design". As a result, feedback from policy implementation did not filter into the process for designing new interventions (see from HOW to WHY in Figure 3.3). Experimentation was seen as a way to build the link between citizens, end-users, stakeholders and policy designers.

Figure 3.3. Policy-making cycle



Source: Updated from OHRA Project Group (2014).

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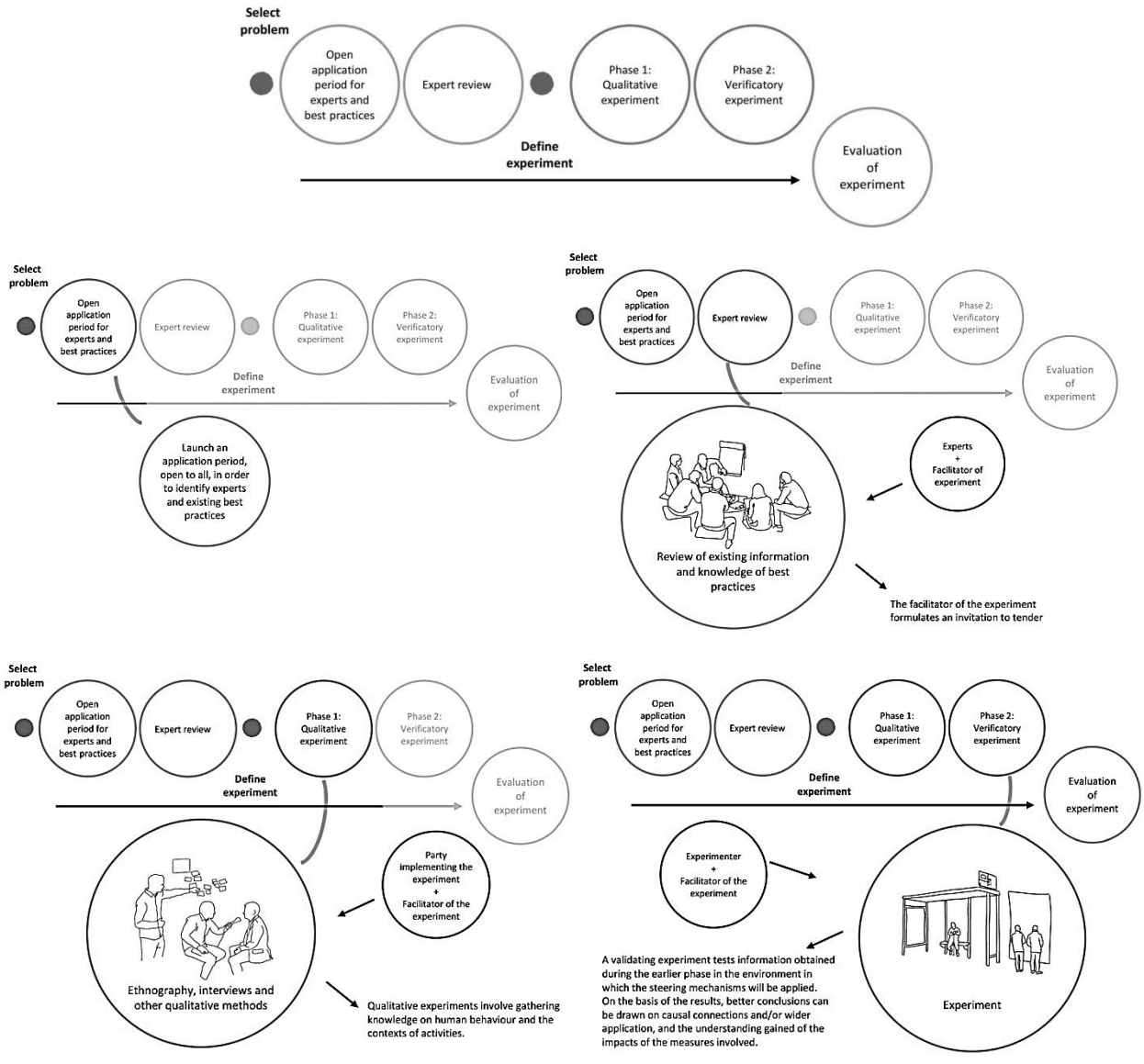
Demos Helsinki proceeded to put the different methodologies together and develop a "human-centred model of experimentation". The aim was to make steering mechanisms more effective by using behaviour-based knowledge and develop those mechanisms in collaboration with citizens (see the process outlined in Figure 3.4). The approach concentrated on different iterative phases: selection of a problem, open call for experts and best practices, expert review (taking stock of the existing knowledge base), defining the experiment, qualitative research, validating the experiment and evaluating the experiment. The model in itself is intuitive in nature and does not introduce novelty to the process of experimentation; but the report itself put the process in the Finnish context reflecting the role of local actors and the policy environment. Furthermore, the model assumed the strong presence of an "experiment facilitator".

Figure 3.4. The experimental policy design model



Source: Annala (2016).

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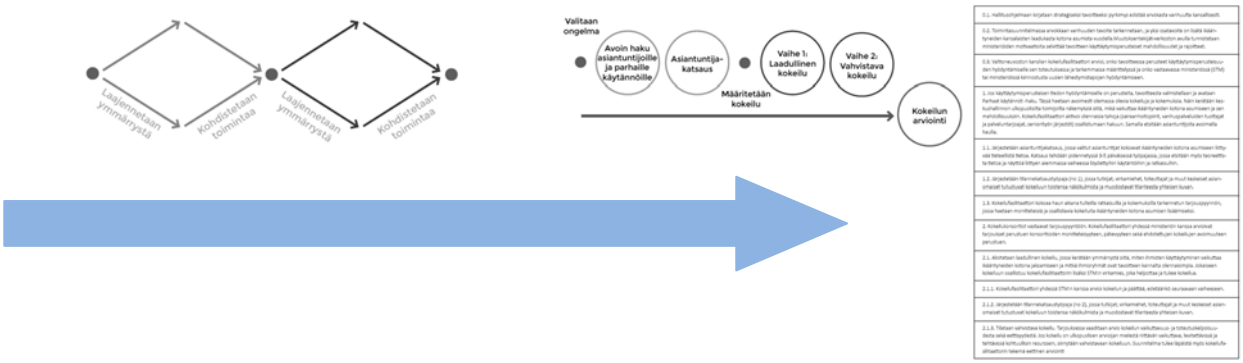
In the early version of the report, Demos Helsinki used a traditional Double Diamond model to describe the process of experimentation in government; however, this proved difficult for civil servants to understand. The model was therefore simplified to show different parts of the process and a table simulating the process was created (see Figure 3.5). Traditional forms of representation proved to be most effective with civil servants.

Figure 3.5. Translating the approach to a public sector context: From the Double Diamond to a table-based simulation



Source: Authors based on Demos Helsinki (2015).

The first draft of the framework was "floated" with political parties in Parliament, three government parties, permanent secretaries, civil servants in workshops and the wider community (NGOs), and international experts. Interviews were carried out with the former and a field trip to London was organised in March 2015. There, the work was presented to international experts and the model was validated (with the participation of BIT, the Design Council, the Cabinet Office, Design Lab, What Works and NESTA). This meeting resulted in the creation of a network inside and outside Finland – later called "the godparents of experimentation" (Kokeilukummit) – who validated the concept. A similar godparent/mentor approach was introduced into the 2015 project to investigate the need and modalities for a specific fund or method for funding small-scale, bottom-up experiments. Such broad validation of the concept helped to create wide-scale acceptance of the approach. As one of the people involved in the process noted, "There was a fair amount of discussion and educating politicians."

Debate was cut short, however, by an opportunity to align the framework with the new government programme. Although the report came out in July 2015,[9] the results had to be presented in mid-March to permanent secretaries, in order to generate discussions on the new programme. As such, the PMO's strategy unit had to develop materials for the new government programme in parallel with Demos Helsinki's work on the report. Both SITRA and Demos Helsinki were involved in the process and encouraged the government to set new objectives. Timing was key.

> *Timing is everything – election and the negotiations – otherwise, with the prior OHRA discussions, it could have actually been a very internal process and the experimentation could have ended with a more lab-type solution.*

In order to leave room for debate, the draft report avoided stipulating strong or overly specific measures for implementing the experimental policy design programme. It outlined the steps of the programme itself, delineated the role of experimentation

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facilitators (but did not indicate the need for a special unit for experimentation) and proposed a two-year implementation period. With broader consensus, backing from the new prime minister and the work of the PMO, the new government programme placed special attention on changing working methods. This became one of six main blocks of activities in the government programme that merged together deregulation, digitalisation and experimentation. For the first time, a truly strategic government programme existed that included "a story for the government, a vision for the next ten years and a plan of action for the four-year term."

The need to advance the schedule unfortunately reduced the time available for some of the planned groundwork for the programme. Demos Helsinki wanted to liaise with Aalto University's Design for Government course, which was running concurrently, but the timelines did not match. The course takes students from different fields – engineers, designers, etc. – in order to analyse different services and systems within the public sector (e.g. students visualised public R&D transactions, outlined the architecture of agricultural subsidies and debated nudging for healthier eating in schools). However, Demos Helsinki's report still cited the course as an example of insourcing ideas.

While the work of Demos Helsinki was fast-tracked, they also conducted follow-up projects and produced reports connected to the programme (regarding funding of experiments, an ethical code of conduct, etc.) (Demos Helsinki, 2016). Their continuing involvement in the process enabled them to brief the PMO, leading to stronger recommendations being debated regarding implementation of the programme after the report was de facto completed. Pushing the agenda forward created a new legal basis for experimentation – evaluated on a case-by-case basis – in the public sector; meanwhile, the Prime Minister's Office set up an internal Experimental Finland Team, which started working in 2016 (see Experimental Finland, 2016).

Experimental culture within a governmental programme creates a strong and effective "license to experiment" at all levels of government. The creation of Experimental Finland Team within the Prime Minister's Office was designed to support the implementation of strategic experiments and a policy of "experimental culture" in accordance with the government programme. The programme also set up a parliamentary advisory group to legitimise action at the highest level. As a result, "a culture of experimentation" became a political goal in its own right.

As mentioned above, the programme specifically took a top-down, bottom-up approach (see Figure 3.6), due to interest in both RCTs/behavioural economics and start-up-style government activities/transition thinking.

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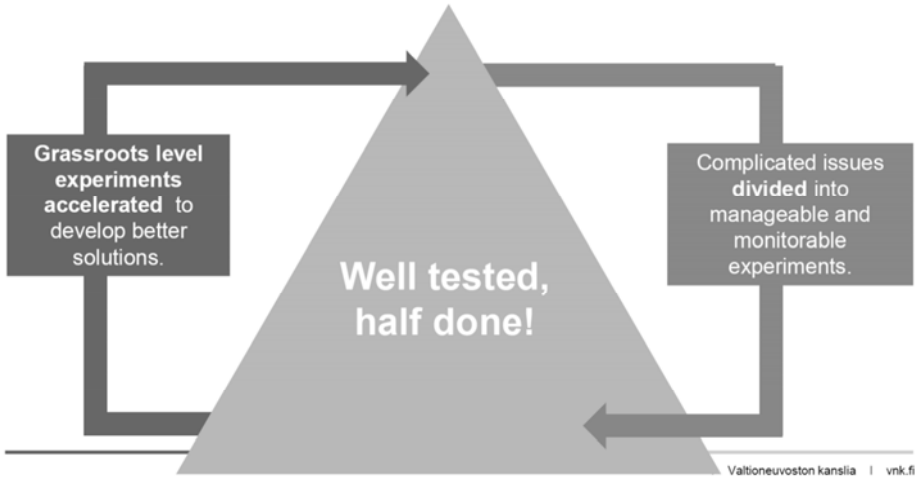
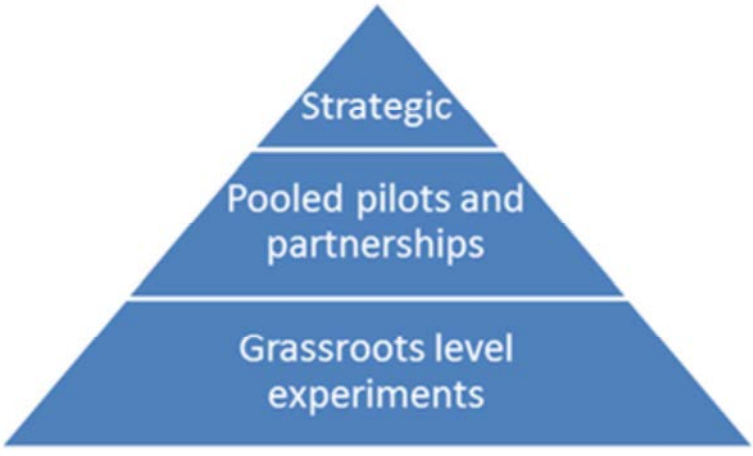
Figure 3.6. The top-down, bottom-up approach of experimental culture



Source: Prime Minister's Office (2016).

Based on the taxonomy developed in the early phase of the Experimental Finland project by the PMO, the Experimental Finland Team engaged with three types of experiments (see Figure 3.7): strategic experiments (policy trials), pilot pools/partnerships (regionally relevant or sector-specific experiments) and grassroots-level experiments (municipalities, regions, academics, charities, etc.). The team is most heavily involved with strategic experiments, but also assists pilots and encourages grassroots-level experimentation by building networks, and facilitating and brokering experiments.

Figure 3.7. Taxonomy of experiments



Source: Experimental Finland (2016).

The Experimental Finland Team is working with a de facto "sunset clause" – they have until the end of 2017 to carry out their activities and plant seeds for further experimentation in government. There has been some discussion about extending the team's operating time, but this remains "very uncertain". They hope to achieve their goals by creating networks of experiment enthusiasts in government (including

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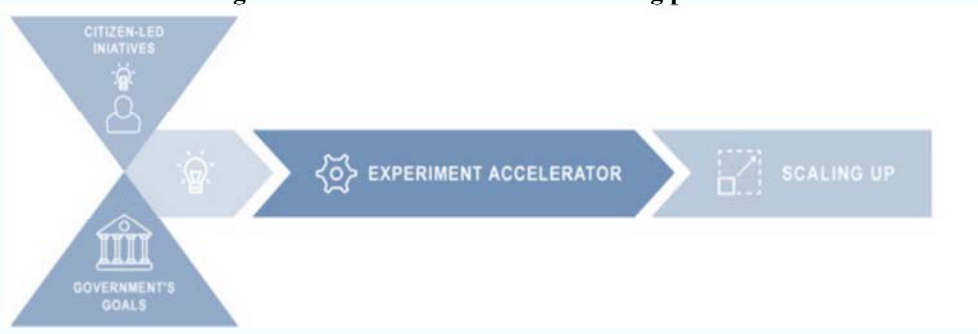
"Kokeilukummit", the "godparents of experimentation") and building co-operation projects with other parties (e.g. polytechnics). This approach describes a top-down push for experimental culture. At the same time, the team has been asked to develop a crowdsourcing platform for grassroots experiments (Box 3.1), which tries to pull together bottom-up initiatives in the field of experimentation. This will function as a web-based toolbox and platform for experiments that will run even after the Experimental Finland Team concludes its work.

Box 3.1. A digital development platform for experimentation

In collaboration with the non-governmental organisation Demos Helsinki and the Finnish Environment Institute, the PMO's programme analysed the funding of experiments, tests and policy trials in Finland. Based on these findings, the government decided to finance a new digital funding platform for piloting and experimenting with public innovations (to be built by the Experimental Finland Team). The need for a platform/digital tool stems from the fact that experimentation at the grassroots level (municipalities, schools, etc.) is very common in Finland, but no central overview of these experiments exists. As a result, learning is coincidental and not cumulative. In its final version, the platform/digital tool should combine idea generation, posting challenges, experimentation methodologies, funding and descriptions of experiments themselves (Figure 3.8). Consequently, it should facilitate evidence-based policy making, create trust and help build a community around experiments.

Figure 3.8. Main features of the funding platform



Source: Annala (2016).

First and foremost, the platform is designed to promote useful initiatives and new practices by supporting small trials initiated by citizens. The project relies on semantic web technologies: an algorithm will gather information about experiments (in Finnish and English) from the Web. The platform will thus enable users to obtain evidence on how initiatives work in practice and help to disseminate their benefits more effectively. It will function as a toolbox, an evidence base and a crowdfunding tool for experimentation.

Ultimately, the goal is to transform the method of developing services from a top-down-dictated process to a more co-created – in some cases, even crowdsourced or crowdfunded – process for public sector innovation and, in this way, help to redefine citizen-government boundaries in the country. The government views an experimental culture as a two-way street that takes grassroots innovations and provides an avenue for acceleration through capacity building and linking innovators with reformers and sources of funding. At the same time, this culture enables countries to divide complicated issues into smaller component parts.

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Box 3.1. A digital development platform for experimentation *(continued)*

The project in its entirety can be described as "lean start-up government" – the Experimental Finland Team had only six months to develop the platform. In April 2016, a political goal was set to develop a platform by the end of the year/beginning of 2017. This gave the team only a short period to develop the scope of the project. The team used the innovation funnel approach and organised four workshops to tackle the short deadlines and co-create a design for the tool. First, an open call to "godparents" was made to discuss what the platform should look like (clarification of scope). Next, they held a validation workshop with selected ICT companies to establish whether the project was possible given the timeframe. The third workshop discussed the wireframe of the platform, and the fourth explored the financing of experiments. In parallel, and as part of the procurement process, the team organised a hackathon to explore technological options for the platform/tool. While the team made progress in co-creating the platform with the experimental community, the short timeframe proved challenging. Furthermore, public procurement rules set boundaries regarding the adoption of certain solutions, which prevented the Experimental Finland Team from combining two options arrived at during the Hackathon.

Although still in its early phases, the aim of the digital platform is to highlight innovative solutions and improvements in services, promote individual initiatives and make use of citizen-driven operating practices. The platform was launched in beta and tested step-by-step during the first months of 2017. It will be launched publicly in May 2017, and be run by a private company. It will be independent from the experimental policy design programme and the Experimental Finland Team. However, without this support system it is uncertain whether the platform's information will be used effectively in government and whether the experiments will be evaluated sufficiently to have learning impacts in the public sector. The Government of Finland must therefore decide how best to ensure continued political support and buy-in after the remaining two years of its mandate, so as to ensure sustainability.

Emerging practice of experimentation

A key question arising from the experimental policy design programme is: When to use experiments? To address this point, the Experimental Finland Team adopted the NESTA typology of experiments – as outlined above. Experiments in the programme can range from rapid experimentation with no extra funding and need for randomisation to formal randomised control trials, with mixed-method design experiments (pilots, etc.) in between. In practise, however, this approach is somewhat confusing to both researchers and practitioners.

While RCTs require a lot of methodological rigour and are, thus, less well understood, grassroots experimentation is both faster and more intuitive. Due to the fast-tracked nature of the experimentation design programme, the PMO and Aalto University (with Demos Helsinki as a partner of Aalto University) are now working on a code of conduct for experiments to establish when and how to experiment (taking into account ethical concerns). "Ideally, this would have preceded the programme", however, the norms are already emerging from practise.

> *I think, if I have to generalize, the rule of thumb is that when you can without major costs carry out experiments, do, especially when you need to make sense in a complex situation, when you need rapid results. When the field is well researched already, then, the question is, why not make a decision based on the existing knowledge.*

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Methodologically, experimentation should be seen as a way to move from uncertainty towards more calculable risks: making one decision and building on it with subsequent decisions. This is especially important in very complex environments. However, it is vital to keep the mandate for an experiment "clean" (and not tied directly to strategies, as the results may show that a solution should not be developed further) and the scope clear. Many interventions cannot be assessed feasibly through experimentation, and in some cases replicability is not straightforward.

Overall, five to six ministries are participating in the experimental policy design programme, and 20 to 25 experiments are ongoing. Experiments are also taking place at the municipal level (e.g. Helsinki, Rovaniemi, Eskola, Muurame and Kuopio) with the aim of increasing participation, strengthening communities, and building bridges between generations and different target groups. In addition, many other small-scale grassroots experiments are underway at smaller municipalities, such as within polytechnics.

The nature and scale of funding for experiments varies from EUR 500 to EUR 20 000 for grassroots experiments and pilots to EUR 50 000 and upwards for fully developed RCTs. Since the programme's inception, several high-level policy trials have been developed. For example, a digital municipal trial and local government trials have been initiated to curb expenditure and reduce obligations under the Minister of Local Government and Public Reforms at the Ministry of Finance. The Ministry of Education and Culture has promoted language trials, the Ministry of Social Affairs and Health is running a service voucher system trial, and the Ministry of Economic Affairs and Employment has launched regional trials in employment and business services. Nevertheless, the strategic flagship trial is the basic income experiment (see Box 3.2).

Box 3.2. Finnish basic income experiment

The public debate in Finland surrounding basic income was based on several different arguments. First of all, SITRA initiated discussions on the nature of future work, in particular: What will happen with employment after digitalisation? If full employment can no longer can be ensured and more precarious employment, stratification and unemployment emerge, what changes should the government make to the welfare system? Politicians also spoke increasingly about abolishing income traps – situations where working "does not pay" because accepting a job means a net loss in benefits and wellbeing to an individual and families. Lastly, debate surrounded the meaning of basic income and its effect on participation and belonging in society. These topics divided the nation in many ways, resulting in proponents and opponents of the basic income experiment at the political level.

The debate culminated with explicit mention of a basic income pilot as a key project of Prime Minister Juha Sipilä's government programme (29 May 2015). Within the centre-right coalition government, the main supporter of the basic income experiment was the Centre Party (Juha Sipilä's party), while other coalition partners were more sceptical (Kalliomaa-Puha, Tuovinen and Kangas, 2016). The government reserved EUR 20 million for the experiment and decided that the social transfers could be used to finance the experiment. Accordingly, unemployment benefits could be used as "basic income" in the experiment to create a much larger sample than the EUR 20 million would allow.

As part of the government's analysis and research plan for 2015, a tender was organised to create a plan for organising the experiment. A multi-disciplinary consortium led by the Social Insurance Institution (KELA) was chosen to carry out planning of the experiment, and the analysis started in September 2015. The consortium proceeded to evaluate four different models (with additional sub-models) of basic income: full basic income, partial basic income, negative income tax and other possible experiments (e.g. participation income).

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Box 3.2. Finnish basic income experiment *(continued)*

The timeframe for the analysis was very tight, as the government insisted that the experiment had to be carried out during the period 2017-2018, as a general election is set for 2019. The KELA-led consortium simulated many models with different levels of basic income and flat rate taxes for basic income, and released its preliminary report – with ambitious goals for the experiment – at the end of March 2016. It included a study design for the government.[10]

However, other factors started to influence the study design. First of all, the KELA-led consortium and the Ministry of Social Affairs and Health anticipated that the Constitutional Law Committee would raise the "equal treatment" principle in Parliament once the legal changes for the experiment were enacted. Thus, every effort was made to minimise the "discrimination" of participants. This meant that different amounts of basic income could not be tested. Instead, the amounts were downscaled to equal the net level of unemployment benefits (EUR 560 per month). As one observer noted, the "baseline somehow became the ceiling".

Secondly, with limited funding available, it was clear that a full-fledged representative RCT was not possible. Within the established fiscal boundaries, the basic income experiment would be limited to unemployed people. Accordingly, the final design selected a random sample of 2 000 persons, aged between 25 and 58, who currently receive unemployment benefits from KELA. The treatment group will continue to receive their benefit of EUR 560 per month and, once employed, will keep receiving the EURO 560 per month tax free in addition to their wage. If no-one from the treatment group is employed during the experiment, the experiment's costs will amount to zero.

Thirdly, the tight schedule coupled with the need to change regulations to facilitate the experiment, and build an ICT platform to administer the benefits, meant that the experiment had to be kept as simple as possible. Stating that "it is impossible to change the tax law so quickly" for the experiment's benefit, the tax authorities simply declared that basic income would not be subject to tax nor would negative income tax be tested. The KELA-led consortium raised the issue of timing and the changes needed to make a fully representative trial possible, however the government was adamant: the experiment had to start in 2017, as "the political will was stronger".

> *Sometimes it felt like we were in the middle of the reformation. Like Marin Luther said: here I stand, I can do no other.*

As a consequence of the above, the final study design was the result of many compromises.

What was surprising to the experts involved was the lack of knowledge within the public sector regarding robust randomised control trials and the level of preparation required. Regardless, the bill was handed to Parliament in August 2016 and the study design was accepted by the Constitutional Law Committee. The law was passed and came into force on 29 December 2016, three days before the first money was paid out.

The team administrating the experiment is hopeful that the trial will function as a starting point, and that the framework will be expanded in 2018 to allow experiments with negative income tax and other forms and levels of basic income to be conducted (Kangas et al., 2017). This, however, will require fiscal and legislative changes to be made during 2017.

However, the association with Sipilä's government has raised concerns that experimentation will cease after the next elections. The new government coalition of 2019 will likely be the deciding factor. Regardless of the results of the actual experiment, sceptics will be able to use this moment to make their case. Even if the experiment is successful, critics might say that the downscaled experiment is not representative or is biased.

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Box 3.2. Finnish basic income experiment *(continued)*

I think everyone's expectations were so high with the basic income experiment that when they actually saw the design of the experiment, they were really disappointed; it didn't resemble the initial model and all the aspects of basic income it was supposed to cover. So, there has been a lot of nagging connected to the experiment.

Nevertheless, the experts and academics involved are highly hopeful that robust trials of this kind will continue. By now, the government is also creating a "pilot" narrative surrounding the experiment.

There are sweeping evaluations of experiments, but you cannot compare an experiment which will affect a sector with billions of euros at stake, to other experiments.

The positioning of the basic income experiment as the flagship of the experimental policy design programme was, overall, negatively perceived by the officials interviewed for this case study. It has become the focus point of experimentation and the basic income story has garnered a lot of media attention, both in Finland and outside the country. As a highly politicised topic, its success or failure has the potential to shadow or eclipse the whole experimental policy design programme. Many experiments deliver mixed results, especially in the social context where problems are complex. Thus, the results of an experiment are subject to political or ideological framing.

Success can in many cases become a political issue. Even if we would want, as researchers, to make decisions always based on evidence, this is not the reality.

Hence, in practice experiments may be used as vessels to introduce topics into the political agenda (having robust evidence makes it easier and safer for politicians to move forwards). However, there is a danger that "bad experiments" will be utilised as a means to remove issues from the political agenda. With regard to the basic income experiment, one expert involved in the programme commented: "it will probably not kill the bottom-up experiments, but it can affect the bigger policy trials".

Impact and effects

The effects of the experimental policy design programme are unclear at this stage – it is too early to say. As one participant noted, "We are hopeful that more forward-thinking organizations will carry the approach forward, so, eventually the majority will adopt the model." Nevertheless, the feeling inside the PMO is that "it has changed the way we think about steering". Furthermore, other projects – such as SITRA's Ratkaisu 100 programme for experiments and concrete solutions connected to Finland's 100-year anniversary – underline the broader emergence of an experimental culture. Nevertheless, ministries are autonomous by nature and the PMO cannot force public organisations to experiment: "There is no way one minister can make all the decisions; it is cumulative." Some public offices are more supportive of experimentation; for example, the Ministry of Transport and Communications, which has an engineering-based practice base and, thus, less contact with citizens and their direct benefits, is very progressive.

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With regard to success factors, participants made the following observations:

I would like to see five experiments go well, and then there would be some evidence about the process, some learning already.

It is not ready at the moment, but maybe in a year's time I can say yes. However, cultural change takes about seven to eight years.

Regardless, the mid-term government programme review will take place soon, and the main concern is whether the government has achieved its objectives. The review will involve a self-assessment of the PMO and ministries to find out what the experiments have accomplished in early 2017. It will conclude with a government strategy session where a political decision will be made: "Probably the political objectives may not change, but the tools of achieving them might."

The different types of experiments have led to a general consensus that simpler, bottom-up experiments are easier – "intuitive in a way, [they] just need a bit of working on the attitude of people". Conversely, bigger, more robust experiments requiring randomisation are much more difficult, as they require solid methodological skills to counter major biases, which public servants do not generally possess. Initial feedback from government seems to favour concentrating on "low hanging fruits" – in other words, simpler experiments that should produce quick returns and provide proof of concept. This may be perceived as downgrading the initiative, however it is important to demonstrate elements of success and provide measurable outcomes to legitimise the work.

What will happen after the current government reaches the end of its term? Are the seeds of experimentation rooted deeply enough in the system to become independent of political parties? It is too early to answer. While the basic income experiment is heavily associated with one party, the whole programme is not perceived directly as part of a political agenda. However, politicians also want to initiate new reform programmes associated with themselves – "everybody wants to put their own label on things" – which may affect the future survival of the programme.

The main challenges the experimental policy design programme will encounter in the future are likely connected to the equity principle and ethics, legislative differences among sectors, and generalisation and fear of wrong estimates regarding the costs involved. Experiments place people into different groups, categories which violate the equality principle that dominates most legal discussions. This may become an issue for public debate similarly to the "lottery winners" of the basic income experiment. Furthermore, such contextual factors sank RCTs in the 1970s. When experiments work in one context, this does not imply that they will work in another. This is the main critique of experiments: lack of external validity. Furthermore, many small-scale experiments and bigger RCTs are not scaled up because of fear of incorrect cost estimates. In many ways, this concern also characterised the basic income debate. As one expert asked, "What happens if this is a success? There should be a plan already."

A systems approach to reshaping an organisation's purpose and working methods: child protection services in the Netherlands

Summary

CYPSA (*Jeugdbescherming Regio Amsterdam*) is a regional Dutch organisation certified to provide Child and Youth Protection Services in the Amsterdam area. Since 2008, the organisation has worked to redefine its purpose and working methods through

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Executive Summary

Governments are increasingly confronted by uncertain and complex challenges whose scale and nature call for new approaches to problem solving. Some governments have started to use systems approaches in policy making and service delivery to tackle complex or "wicked" problems in areas ranging from education to ageing, healthcare and mobility. Systems approaches refer to a set of processes, methods and practices that aim to effect systems change.

Adopting such an approach requires significant adjustments on the part of governments. It means moving away from traditional linear procedures, strategic planning and the notion of reform as an isolated intervention. Instead, policy makers need to focus on building capacity to forecast future scenarios and applying leadership to mobilise a broad range of actors to achieve a common good rather than narrow institutional interests.

Systems approaches help governments to confront problems that traverse administrative and territorial boundaries in a holistic manner. They call for constant adjustment throughout the policy cycle, with implications for the ways in which institutions, processes, skills and actors are organised. Because they focus on outcomes, systems approaches require multiple actors within and across levels of government to work together. To effect systems change, administrations must develop a vision for a desired future outcome, define the principles according to which that future system will operate, and start to implement a set of interventions that will transform the existing system into the future system.

Changing entire systems in the public sector is difficult, largely because public services must be continuously available – they cannot be turned off, redesigned and restarted. Systems approaches can help navigate this difficult transition by allowing new practices to be rolled out while core processes are still running. Furthermore, systems approaches can help organisations to better manage complexity by striking a balance between simplification (focusing on the intended outcome) and complexification (tackling multiple factors within a system at the same time). Changing the system also requires building internal skills into organisations to help them face and adapt to new circumstances.

Systems change invariably spurs debate about the relative value of policy choices, and the trade-offs to be made. For example, in the Canadian case of car-sharing, the flexible transportation system took precedence over other concerns such as precarious work conditions. In Iceland, domestic violence had to be reframed as a public health issue rather than a private matter.

"Independent brokers" can facilitate these value debates and create a level playing field for change. For example, an outside government lab, MaRS Solutions, was involved in changing the Toronto transportation system because all parties viewed it as a non-partisan participant. In Finland, the Nordic think tank Demos Helsinki was able to

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