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.

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.

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.).

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.

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

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
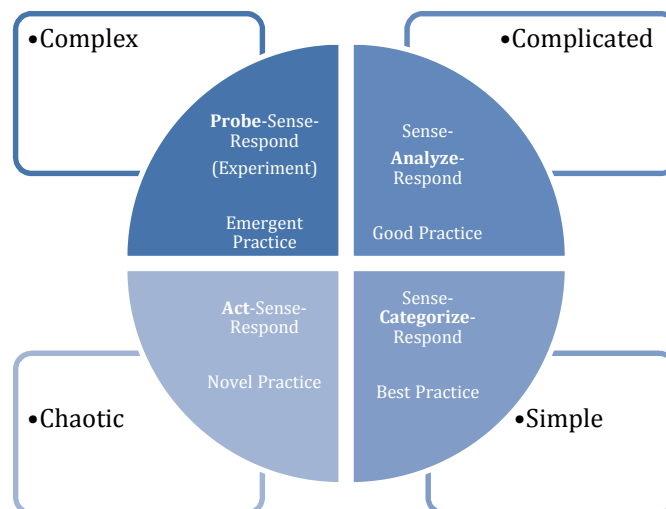
Source: Based on Snowden and Boone (2007).

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

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.

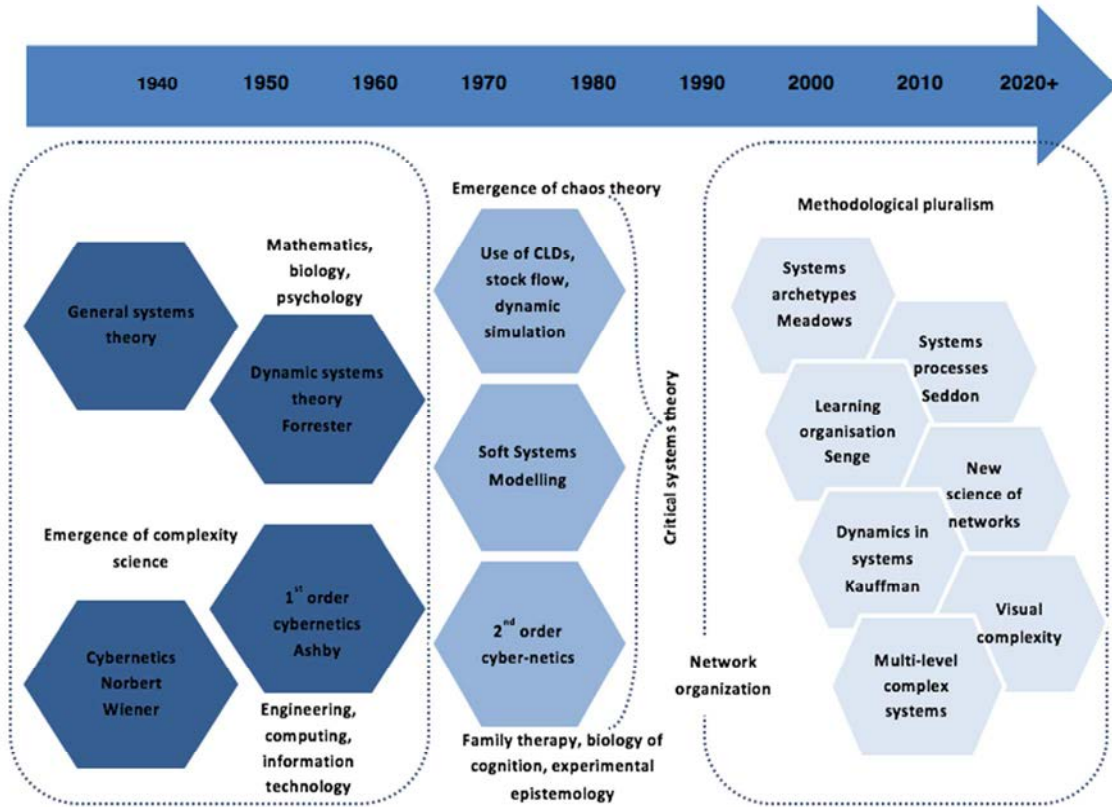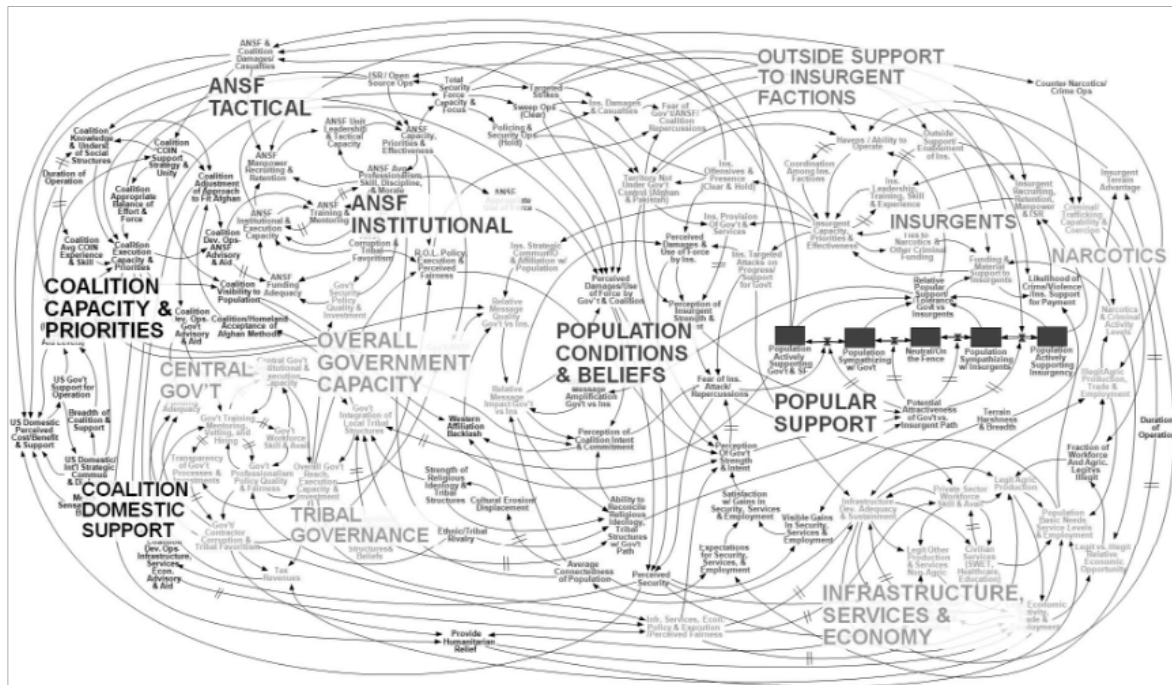**Figure 1.2. Development of systems thinking: towards methodological pluralism**

Figure 1.3. Complexity of the American strategy in Afghanistan

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

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

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.

- 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-

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).

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

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

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
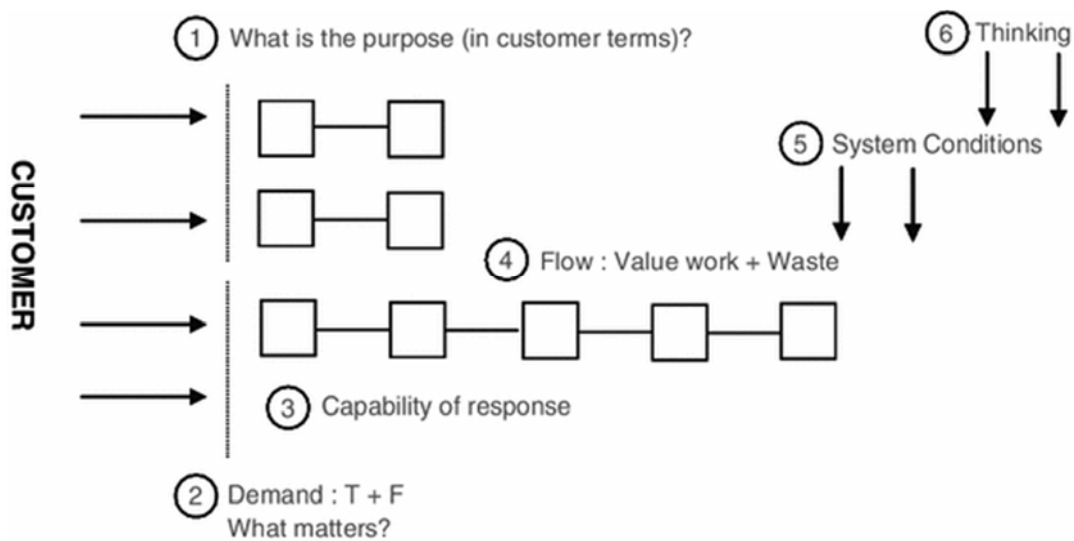
Source: Seddon (2003: 112).

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.

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).

- 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.

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

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.

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.

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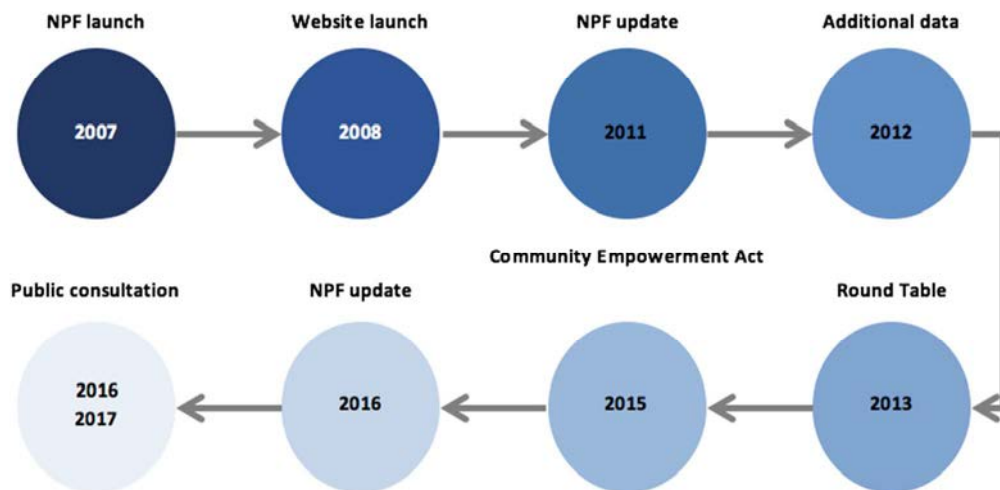
Sources: Cook. (2017); Scottish Government (2016).

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

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).

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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