# OECD Observatory of Public Sector Innovation

An initiative of the OECD's Public Governance and Territorial Development Directorate

# Working with Change
## Systems approaches to public sector challenges

Preliminary version

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# FOREWORD

1.      Complexity is a core feature of most policy issues today, yet governments are ill equipped to deal with complex problems. Increasing atomisation of jobs creates new challenges to both the education and welfare system. Ensuring a high-quality, active life for an ageing population puts pressure on the labour market, but also requires new ways of providing medical and social care. Wicked problems such as climate change, obesity, radicalisation, income inequality and poverty – where causes and effects are blurred and no clear solution exists – have become rife. No single public sector organisation – from a solitary city to the central government – can tackle these issues alone.

2.      In a context of complexity and uncertainty, traditional analytical tools and problem-solving methods no longer work nor produce their intended purpose. This prompts government leaders across the world to ask: how do we manage increasing complexity while accounting for uncertainty and still deliver public services that adapt dynamically to produce viable solutions? To a degree, the answer lies in public policy makers making decisions in such a way that leads to resilient systems and adaptive structures that incorporate, rather than filter out, complexity.

3.      Systems can be defined as elements joined together by dynamics that produce an effect, create a whole or influence other elements of a system. Changing the dynamics of a well-established and complex system is not easy. This requires not only a new way of examining problems but also bold decision making that fundamentally challenges public sector institutions.

4.      Traditionally, public policy makers have addressed social problems through discrete interventions that are layered on top of one another. However, these may shift consequences from one part of the system to another, or address symptoms while ignoring causes.

5.      Since the recognition of this *complexity gap* (the gap between the problems faced by institutions and their capacity to tackle them) systems thinking, and other systems approaches such as design thinking, have gained traction. Looking at the whole system rather than the parts allows one to focus on where change can have the greatest impact.

6.      Within the framework of the work of the OECD Observatory of Public Sector Innovation, this report explores how systems approaches can be used in the public sector to solve "wicked" problems. Through the analysis of concrete cases, the report describes how systems approaches can make public services more effective and resilient. The report contributes to the ongoing work of the Public Governance and Territorial Development Directorate in exploring new ways of approaching public policy design and implementation, thus creating the foundations for stronger and more inclusive growth.

7.      The report starts by exploring the theory and practice behind the use of systems approaches in tackling public challenges. The first part addresses the need for systems thinking in the public sector, its theoretical underpinnings and why it has not been widely used in the public sector. The second part identifies a set of tactics – people & place, dwelling, connecting, framing, designing, prototyping, stewarding and evaluating – that can be deployed by government agencies either unilaterally or with

partners to work toward systems change. The third part provides an in-depth examination of systemic change and how it has been applied in practice in the areas of preventing domestic violence (Iceland); protecting children (the Netherlands); regulating the sharing economy (Canada) and designing a policy which sets the framework for conducting experiments in government (Finland).

8.      This report is an open invitation to policy makers to reflect on the systemic nature of most public sector challenges and consider how systems approaches – for example those based on integrated interventions, stakeholder engagement, and reverse process  engineering– can help achieve better outcomes for all.

**EXECUTIVE SUMMARY**

9.      Governments are confronted by uncertain and complex challenges whose scale and nature call for new approaches to problem solving. Some of them 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 system change.

10.      Adopting such an approach will require significant adjustments on the part of governments. This requires moving away from traditional linear procedures, strategic planning and the notion of reform as an isolated intervention in favor of building capacity to forecast future scenarios and ensuring that leadership is applied to mobilising a broad range of actors to focus on achieving a common good rather than on narrow institutional interests.

11.      Systems approaches help government confront, in a holistic way, problems that span administrative and territorial boundaries. They call for constant adjustment throughout the policy cycle, with implications for how institutions, processes, skills and actors are organized. Because they focus on outcomes, systems approaches require multiple actors within and across levels of government to work together. In order to effect systems change, administrations must develop a vision for a desired future outcome, a definition of the principles according to which that future system will operate, and a set of interventions that will start to change the existing system into the future system.

12.      Changing entire systems in the public sector is difficult, in part because they cannot be turned off, redesigned and restarted; public services must be continuously available. 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 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 in organisations to help face and adapt to new circumstances.

13.      System 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.

14.      "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 saw it as a nonpartisan participant. In Finland, the Nordic think tank Demos Helsinki could challenge the *modus operandi* of public sector institutions, thus creating the conditions for introducing experimentation in government.

15.      To initiate and sustain systems change over time, individuals at the top of organisations need to be involved, especially when trying to change long-established and complex systems. However, leadership is not enough: a critical mass of actors in different positions and roles, who understand the need for change and also 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.

16.     Systems approaches require working across organisational boundaries and government levels. For example, in Canada there was a concerted effort from both the municipal and provincial level to create the possibility for a sharing economy. In the Netherlands, changing the child protection system began with change in one organisation, but it soon became clear that to achieve real results, the rest of the supporting structures, from accompanying services to the legal framework, had to change as well. When systemic changes become institutionalised it is very difficult to turn back to the 'old way of doing things'.

17.     Meaningful measurement and feedback mechanisms are 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.

18.     Time is an essential resource in systems change: people need to live through and experience the change rather than be told about it by a third party. The timing of change is thus crucial. For example, to implement the Experimental Policy Design programme in Finland, 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 show the difficulties of rapidly scaling up change. In order for change to "stick", people need time to internalise the solutions.

19.     New, more agile and iterative financing measures should be created to support the use of systems approaches. In the cases of both Canada and Finland, dedicated non-government partners invested more time and energy into the projects than was initially planned. In the Dutch case, initial investment needs were beyond the resources of the organisation and needed to be found from outside, but the change also produced a 22% reduction in costs per service user. Better instruments are needed to assess the initial return on investment and to track how benefits from system change are realised and to whom they accrue.

20.     While this report provides some initial insights into the theory and practice of system approaches in the public sector, more work needs to be done both collecting information on the experiences of systems approaches and drawing lessons from cases to develop guidance for policy makers undertaking system transformation.

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**SYSTEM APPROACHES IN THE PUBLIC SECTOR: FROM THEORY TO PRACTICE**

**Introduction**

21.        Complexity and uncertainty are now the norm—they are *contexts*—not just risks. The world seems to operate by a new set of rules that are difficult to observe directly. The defense and intelligence communities have called this the VUCA world, which originally described the Volatility, Uncertainty, Complexity and Ambiguity left behind by the end of the ordering function provided by the Cold War. Today, technology, decentralization, the rise of non-state actors and other factors have accelerated the rise of VUCA in every domain. Labor markets and financial systems are more and more interconnected which means that it becomes increasingly difficult to identify causes and effects of complex problems. For instance, a transformative referendum such as Brexit seemed unlikely even three years ago, let alone that it would pass. Its total impact to both the UK and Europe (and indeed the rest of the world) is all but impossible to predict, yet will certainly be profound. The public sector as a whole is contending with VUCA, even if administrations do not understand how, where and why.

22.        So the question today is: *how to account for uncertainty while managing greater complexity and still deliver effective services?* To a degree, the answer lies in how public policy makers can make decisions that lead to resilient systems and adaptive structures. The decisions themselves will depend on how completely the problem and its context is understood and how well the dynamic relationship between interventions and context is tolerated. This requires a new mindset that acknowledges uncertainty as part of everyday decision making and enables working in iterative ways. It also calls for the understanding that there is path dependency in all of our public sector institutions and policy interventions which may not serve us well, or worse, lead to predictable outcomes.

23.        Changing the dynamics of a well-established and complicated administrative system is not easy. A new and necessary complex process of seeing, understanding and deciding fundamentally challenges our institutions; this is the makings—the foundational conditions—of a *governance crisis*. Our 19th Century institutions are outmoded by 21st Century problems stemming from interconnectivity, cyber threats, climate change, changing demographic profiles and migration. Traditionally, public policy makers have dealt with social problems through discrete interventions that are layered on top of one another. However, these may shift consequences from one part of the system to another or continually address symptoms while ignoring causes. It is within this *complexity gap* (the disconnect between institutional capacity and the problems they face) that systems thinking and other systems approaches such as design have gained traction.

24.        Design, systems engineering, systems innovation, systems thinking and design thinking have interlinked philosophical foundations and share in some cases, methodologies.[1] For this analysis the umbrella phrase *systems approaches* is used to describe a set of processes, methods and practices that aim at affecting systemic change. Using systems approaches in public service delivery can be very difficult due to siloed structures and narrow remits, but in fact they can be operative here too. Public interventions need to move beyond a narrow input-output line of relationships. Of course depending on the maturity of the system it may be easier or more difficult to change public service delivery systems, but new developments are already on the way: new urban transportation systems, e-healthcare systems, learning ecosystems, etc.

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[1] 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 processes of ordering information in complex systems in a way that leads to action.

The OECD (2015) has previously drawn attention to this topic in the "*Systems innovation: synthesis report*" which discussed the public sector challenges through a systems innovation lens. While the 2015 report relied on very specific systems approaches – systems dynamics and socio-technical systems used often in sustainability analyses – to look into the role of systems thinking in innovation policy, this report focuses on how public policy makers can use a multitude of systems approaches across different policy areas.

25.      System thinking has a long history, but it is far from an established field. There are no systematic overviews on the use of systems approaches in the public sector nor is the process in practice formalized. Furthermore, little empirical research has been done on the strategies policy makers use to deal with uncertainty in practice. In our initial research, only a few well documented cases of systems approaches in the public sector were found. The small number may indicate that governments insource 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 a renewed interest to look at the potential of system approaches such as design more rigorously in the public sector.

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

27.      Over this chapter, Chapter 2 and the case studies, the report aims to address the following questions: How can I examine my own system to see if we are ready for a systems approach? What are the conditions necessary? What are the variables to consider when developing a systems approach? As hinted above, there are no simple answers to these questions because each situation is different. But here in brief are some indicators:

- An "innovation" agenda has taken root in government or your 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 with traditional execution formats (in other words, the line between external stakeholder and government must be blurred to achieve impact)

- Variables include: having a champion committed to change, capacity to experiment, ability to engage internal and external stakeholders, resourcing (time, capital, etc.) sufficient to delay business as usual

28.      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 predominantly administrative mode managing well defined objectives where a change mandate does not exist; 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 in nearly every domain, and that it is possible. 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, toward allocating the resources to make systems approaches an integral part of the public organizations' everyday practice.

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

29.     Governments that have spent decades perfecting systems that can successfully manage *complicated* problems (such as banking regulation, trade treaties, and healthcare systems), now find themselves immersed in a world of *complex* problems. A complicated problem is one that is ultimately predictable with sufficient analysis and modeling. They are linear, with some identifiable beginning, middle and end and while they may have many parts, it can be understood how the parts create a whole. Management systems such as Six Sigma have demonstrated value as tools to tackle complicated problems.[2] Complex problems on the other hand are inherently unpredictable. They are frequently called *wicked* or *messy* because it is difficult to assess the true nature of the problem and therefore how to manage it (see characteristics of wicked problem in the box below). Rather than having discrete parts bound together in linear relationships, complex problems are emergent: they are greater than the sum of their parts.

30.     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 its constituent parts and manage them through discrete interventions, layered one on top of another. However, by looking at actors and interventions in isolation or disconnected from past efforts, complex policy legacies may fail to be captured and addressed. Qualitative case studies have been used as analysis method of 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 are specific to the problem and context being analyzed thereby providing little that can inform decision makers on how to take action.[3]

31.     As wicked problems continue to multiply, the digital revolution is delivering to individual citizens more power and voice than ever before. On one hand, citizens' expect more personalized services that focus on individual needs. On the other, countries have increasingly diverse populations which call for tailor-made approaches. For example, elderly care for migrant populations can be vastly different from standard care services.[4] Consequently, standardized, large-scale public service solutions delivered via command and control administrative systems[5] do not work anymore forcing government to rethink service delivery boundaries and design solutions which take into account a broader set of actors and their relationship.

32.     As a result, stakeholder maps have been redrawn. Citizens are now at or near the center, 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

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[2] Kamensky 2011

[3] Ibid.

[4] Draulans and De Tavernier (2016) analyze the old age care needs of Turkish communities in Belgium to show that traditional public service delivery systems do not work for people from a different cultural background, leaving people out of 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.

safety supervisory model based on consumers' reports[6]). Public services that are not meaningful or relevant to citizens may struggle to build coalitions of support.

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[6] Global Innovation Review call 2016.

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**Box 12. Characteristics of wicked problems**

The idea of wicked problems first emerged in the 1970s from the perspective of systems theory, with the understanding that problems cannot be understood and addressed in isolation.[7] Wicked problems have many characteristics, but their principal challenge to governments stems from the fact that they cannot be solved only by partial or transactional solutions, but requires concerted, adaptive and carefully stewarded approaches. There may be classes of wicked problems (those arising from path dependencies, incumbent interests and structural lock-ins or accelerating change), but each problem has unique traits that stem from its context, history, stakeholders etc.

The key aspects of wicked problems include the following:

- The implication of multiple stakeholders, each acting to a certain extent within their own norms.

- Complete diagnosis or understanding is not possible—"there are no definitive definitions" 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, often future gets discounted for short term agreements.

- Liminality is inherent in the analysis and intervention in wicked problems. 'Liminality' denotes the condition that is 'betwixt and between the original positions arrayed by law, custom, convention and ceremony'.[8] In refers to a space where regular routines are suspended.

- Because wicked problems are impossible to directly observe, they are unpredictable and their behavior is uncertain.

- Efficacy of solutions is difficult to determine because of knock-on effects, self-adaptation and their inherent complexity. Attempts have been made with RCTs and other evidence-based instruments, but they are fundamentally challenged by the fact that they must be artificially bounded in order to manage complexity and make them feasible.[9]

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 it is the norm for rigid institutions and bureaucracies to avoid big problems in favor 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.

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33.     Policy makers must also contend with complex policy legacies. Traditionally reductionist approaches applied to social system have proven their limit to take into account complex social problems and its web of legacies. For the sake of expediency, manageability, and clarity, reductionist approaches simplify complex problems into what are considered to be its constituent parts and manage them through discrete interventions, layered one on top of another. By looking at actors and interventions in isolation or disconnected from past efforts, complex policy legacies may fail to be captured and addressed.

34.     As policy problems have changed toward systemic, interdependent challenges, their understanding and analysis needs to change. In highly complex problems, the relationships between causes

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[7] Rittel and Webber 1973; Head and Alford 2013.

[8] Turner 1977, 95.

[9] Hämäläinen 2015.

and effects are neither linear nor simplistic. It could be hard to establish whether reduced waste come as a result of improved industrial packaging or changing consumer habits or stricter controls. In the context of this boundless complexity, solutions can have serious unintended consequences. The construction of a simple road overpass in Somerville, Massachusetts (much needed from an infrastructure development perspective), led to a rise in childhood obesity rates.[10] In complex contexts cause and effect can be only obvious in hindsight, thus, in different analytical tools are needed. For example, the Cynefin Framework (Figure 1) – developed early 2000s within IBM for decision-makers – identifies four different contexts: simple, chaotic, complex and complicated. The difference between complicated and complex context is that there is at least one right answer in a complicated system as it is possible to identify casual relationships (even if they are not at first seen), while a complex system is in constant flux. Thinking of different policy problems in this perspective helps to exemplify that various analytical methods need to be employed in different situations. At the same time, in reality systems are continuously more complex and not only complicated – in expert-driven domains the mental bias, of presumably knowing what the right answers are (seeing systems as complicated and not complex), can produce adverse effects. This means that one needs to understand the policy systems better in a public sector context and not overestimate our knowledge in an increasingly complex world.

**Figure 1. The Cynefin Framework**
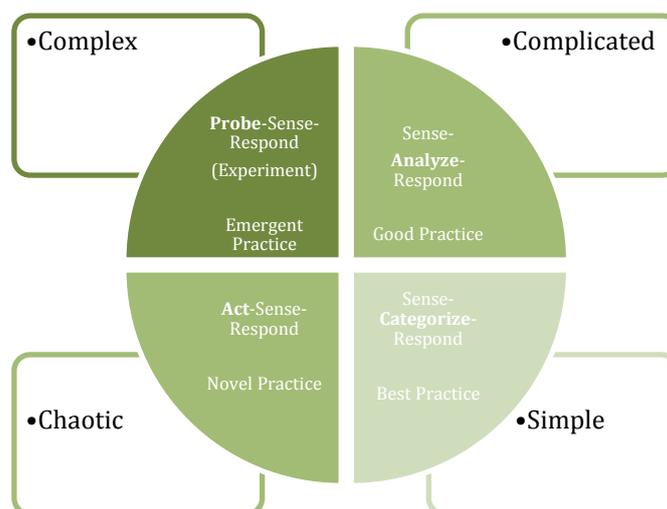


*Source:* Based on Snowden and Boon 2007.

*35.* *In essence,* systems are elements joined together by dynamics that produce an effect, create a whole or influence other elements and systems (see for a more detailed account in box below). Systems exist on a spectrum of comprehensibility: from easily observed and analyzed (e.g. food chain) to highly complex or novel requiring postulation (e.g global climate systems). Systems share some common features: they are usually self-organizing meaning that system dynamics grow out of a system's internal structures; they are connected, thus, their parts affect each other; they are constantly changing and adjusting. They can be also counterintuitive meaning that cause and effect are distant in time and space. They are governed by feedback, are path-dependent, resistant to change and characterized by non-linear relationships.[11]

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[10] http://www.governing.com/gov-institute/voices/col-systems-thinking-public-policy-programs.html

[11] See in the case of health systems WHO 2009.

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**Box 13. Defining systems**

Applying systems approaches relies heavily on how systems are defined, i.e. which relationships are considered important. There are many ways to define systems: from geographic proximity (local, regional, national and international) or in terms of production, market (e.g. a sectoral system including all upstream and downstream producers and the characteristics of the markets which they serve) or technological affinity (technological systems). OECD (2015, 18) has previously used the working definition 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 can be somewhat misleading as it puts the sole attention on the network of stakeholders. However, public policy systems include not only stakeholders, but also regulations, organizational routines, cultural norms etc.  As public policy systems are generally outcome oriented, the report applies the purposeful systems definition by Ackoff and Emery (1972) where the system is bounded and created to achieve its goal(s), its purpose. Hence, elements of the system are operationalized based on their connection to the goal of the system.

Source: OECD 2015; Ackoff. and Emery 1972.

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**Figure 2. Development of systems thinking: towards methodological pluralism**
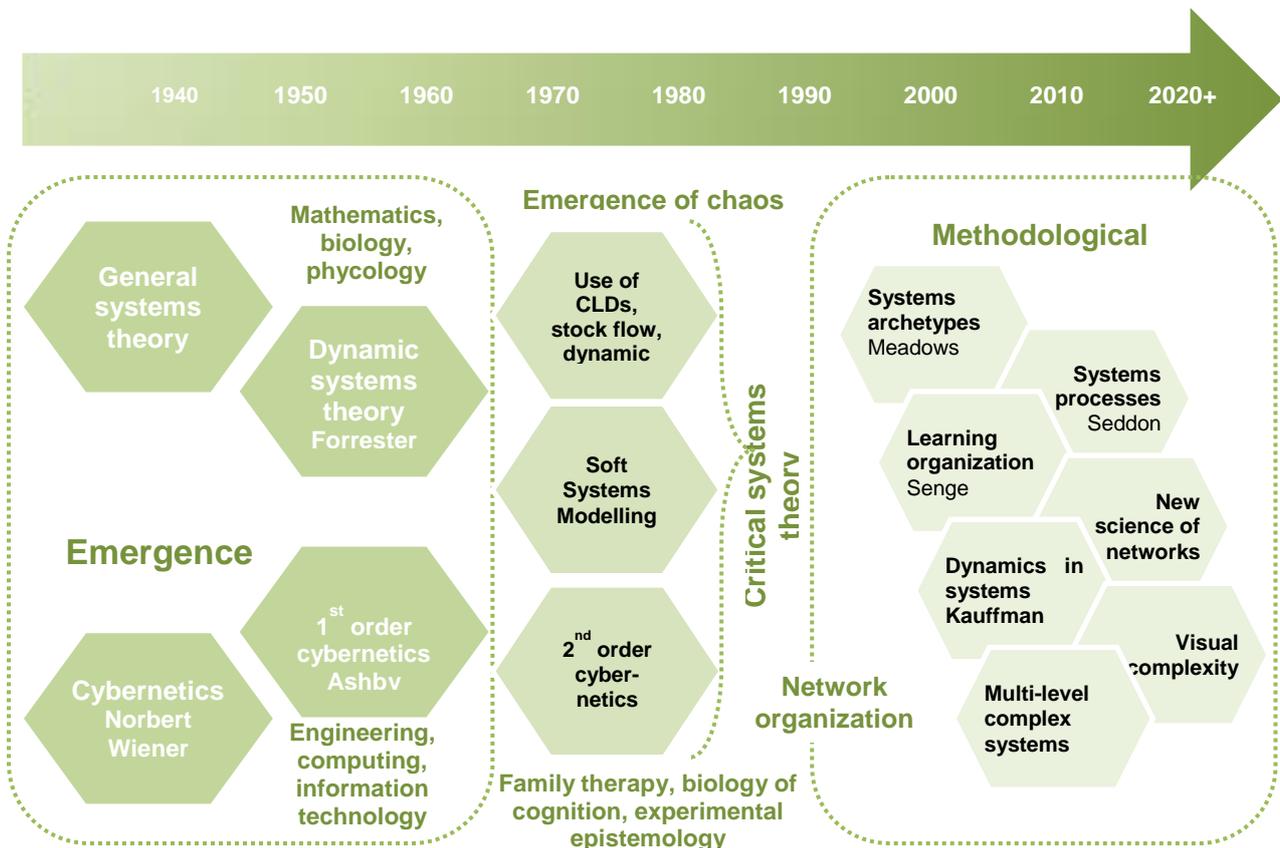


36.     Systems approaches have developed over the last 75 years (see figure 2 above). With increasing computing power there are more tools than ever to trace and visualize causal relationships and simulate complex problems (from causal loop diagrams, stock flows to dynamic simulations, group and mediated modelling). However, modelling always comes with a cost: predefined assumptions simplify complex problems and can lead to the wrong path. Also, more qualitative systems approaches have emerged (soft systems modelling) that concentrate more on identifying the objectives of the system, rather than

modelling systems backward from the predefined goal. Both broad approaches have benefits that can be used in different policy situations (either as a sense making tool in a situation where there is an overabundance of data or for gaining insight into decision making and planning process). In practice, most systems approaches use a multitude of methods and the origins of the approaches in detail can no longer be distinguished (a more thorough discussion of the theoretical background and limitations of systems thinking can be found in Annex 2).

37.     Applying a systemic lens to complex problems is useful to map the dynamic of the system underpinning it, how the relationship between system components affect its functioning, and what interventions can lead to better results. System thinking help understand how systems are structured and how they operate. This means understanding what lies between the parts, their relationships, and the gaps between the knowns. It also means reflecting on how to take action from this understanding (i.e. design and design thinking) by creating proposals that are tested before becoming interventions in the systems in question.

38.     The below system diagram (figure 3) of the US military strategy in Afghanistan from 2009 underscores the importance of how visualization of the system alone does not increase the understanding of what needs to be changed in practice[12] and that design thinking can help moving from visualizing systems to actionable knowledge that allows public managers to make decisions.

**Figure 3. Complexity of the American strategy in Afghanistan**



Source: http://www.nytimes.com/2010/04/27/world/27powerpoint.html
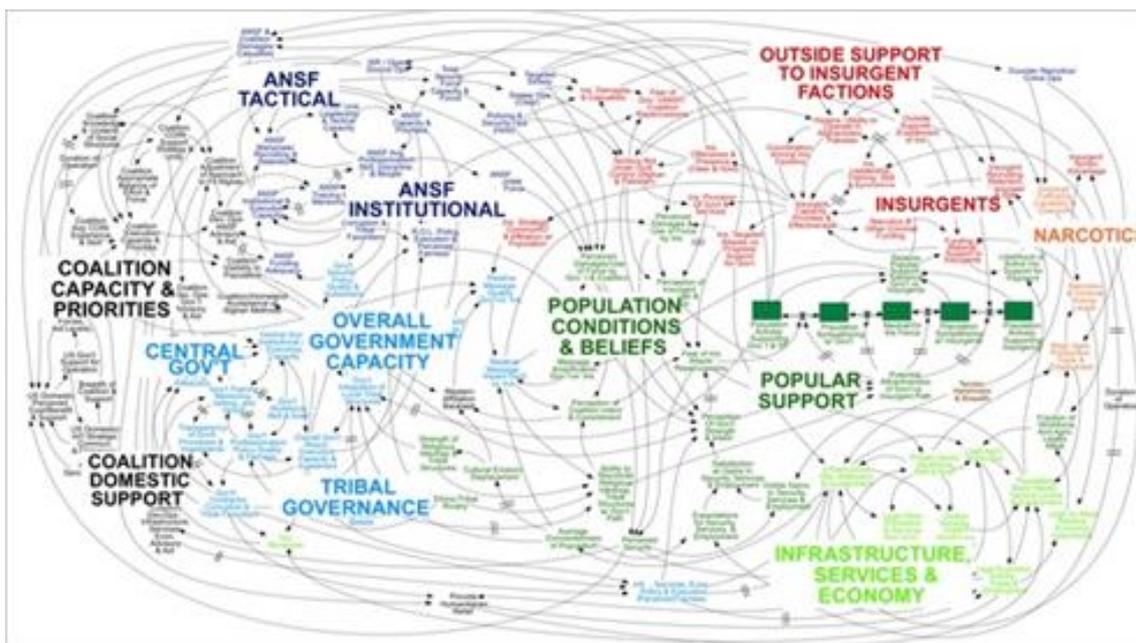
39.     While it is tempting to assume that front line public services and administrations are distant from or not implicated in large scale complex problems—let alone wicked problems—careful observation suggests otherwise. For example, responding to the challenge of an aging population require interventions at system level to balance social transfer reform and the transformation of service delivery in line with the needs of senior population.

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[12] http://www.nytimes.com/2010/04/27/world/27powerpoint.html

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**Box 14. The case for system approaches: ageing populations**

Aging populations is a rich territory for systems approaches. Senior housing, ongoing medical care, nutrition, socialization 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 to 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 have fallen 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 will continue to preserve the system for some time. But to prevent the collapse of public budgets, large scale systems transformation will be required. Societies will need to redesign institutions and other structures to meet the demands of a majority senior population—a significant departure from the current state which favors the young and economically productive.

This transformation cannot happen 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, administrations will be engaged in the transformation of large scale systems by necessity to avoid further governance crises for a problem that is typically managed at the level of public service delivery.

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40.     Aging population is not the only domain where system approaches can be applied. There are other public service problems that systems approaches can help solve:

- *Mobility* in general is very appropriate for systems thinking and design, not least because they are complex, interdependent systems manifest in physical matter. But also because the landscape of mobility is shifting away from a need for large scale infrastructure, to smaller individual or medium scale solutions that go the "last mile." These are 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 smart phones for the visually impaired. The system allows smartphone owners to receive written or verbal information on the location of the bus stops, number of an arriving trams, the entrance to the museum or taking the queue in the Municipal Office.[13]

- *Education* is also appropriate for systems approaches because of contextual variance. This describes how nearly every transaction in education is unique, and how the objectives of each participant in the transaction are also unique (for instance, school leader to teacher, teacher to student, student to 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. For instance inculcation of shared identity versus agency and independence for students. Systems approaches help to navigate this space where the optimal is often impossible.

- *Machinery of government* (i.e. changing the organization behavior of agencies) is another space where systems approaches can achieve impact. Design is a way of organizing processes, and if bureaucracies are anything, they are repetitive processes. Systems approaches, including design,

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[13] Global Innovation Review call 2016.

can function as a neutral broker/arbiter to evaluate process and work to optimize or even better, redesign them toward a transformative capability.

- *Policing, human services, environmental protection, planning, housing, waste and energy* are all domains in which systems approaches have proven or 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, expectations among a myriad other factors that served these constituents are largely outmoded and must be renewed.

41.     Interconnectivity, wicked problems and empowered citizens are all driving governments to change the way 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 well will continue to decline. To engage 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**

42.     This section will look into the 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 (e.g., healthcare, education where service provision must be continuous);

- and, working in quickly changing conditions.

*Use of information in highly complex environment: evidence versus action*

43.     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. With less information, especially information that was contradictory, decision making could proceed unencumbered by uncertainty or complexity.

44.     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 in a sufficient understanding of a situation? As discussed above, when working on problems related to broader systems or wicked problems, there often is no definitive definition.

45.     Nevertheless, the wave of evidence-based policy making seems to assume that policymakers are able to wait until sufficient amount of data is available before acting.[14] This does not correspond with the everyday policy practice, where reforms and 'decisive' action are undertaken every day. This means that in many cases policy makers concentrate on tangible, specific aspects of the puzzle rather than approaching

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[14] Head 2010, 13.

complex problems with a comprehensive, holistic lens. It is indeed unrealistic to hope that every decision in the public sector should be based on robust evidence, however, the danger of it has to be acknowledged as well: it is difficult to change practices that become commonplace following fast-track decision making.

46.     Conversely, evidence-based methods or rational diagnosis to policy making tend to emphasize positivism and thus, may become overly technocratic overlooking the fact that many competing policy solutions are ideological, value based.[15] Thus, information is not only used to diagnose problems, but also legitimize value-based decisions.

47.     To decrease uncertainty in public sector environments different methods (e.g., scenario planning, horizon scanning 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 avoidable limits to the relevance and usability of knowledge.[16] 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.[17]

### *Learning and adjusting the system: the feedback loop dilemma*

48.     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. Feedback loop gives information about the functioning of the systems which may later change the policy intervention or its effects. Feedback reinforces what the organization has already learnt and guides future learning processes both on the individual and organizational levels. Thus, feedback is needed to learn and most systems approaches talk about single and double-loop learning.[18] The first describes learning connected directly towards the policy at hand and the other describes a process of reflecting, which allows to change the broader management component behind the policy intervention. There is also a broader 'deutero learning' - learning about learning - which denotes the institutional capacity of organizations to learn.[19]

49.     Feedback loops that lead to meaningful insights - and thus, learning - can only be created with open-ended processes. This means that the system is receptive to alternative ways of doing things, alternative opinions, has tolerance for risks and risk-taking.[20] Both organizational and individual factors influence these processes.

50.     However, these open-ended feedback loops have become more difficult in the public sector due to 'purchaser-provider split' in public service delivery that has emerged with the agentification in the public sector and the prevalence of traditional procurement procedures. Procurement practices in the public sector in general limit open ended processes which makes also the use of iterative, agile methodologies very difficult.[21] There are, however, efforts to counter this: for example, the federal government in the US 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 minimizes 'bid and proposal' high quality vendors, but also diminishes the risks of government going into

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[15] Stanhope and Dunn 2011.

[16] Mulgan 2005.

[17] Feldman and March 1981, 176.

[18] Agryris and Schön 1978.

[19] Ibid.

[20] See more in an Acker et al. 2015.

[21] Usually public sector organizations 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, 'learning by doing' becomes very difficult later on. This is easily exemplified in software development processes Book et al. 2012.

open ended development processes.[22] 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. This measurement systems assumes that accountability equals performance.[23] However, linear accountability frameworks only work well in predictable environments.[24]

51.     Static measurement systems that are supposed to supply feedback to dynamic processes in the public sector tend not to work.[25] Most evaluation systems in the public sector do not account for long lead times nor 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 judgments. Consequently, feedback in complex issues needs to also incorporate the dynamic nature of processes - continually "learning by doing" - and also systems knowledge, ability to put value-based information into context. More importantly, this is needed to quickly address ripple effects in the system, unintended consequences - for example, noting that building a road bypass has a serious effect on children's health.[26]

*Turning a system off*

52.     New systems models can be designed in the abstract, but ultimately they will need to be built within existing systems. This is because large scale systems such as education or healthcare cannot be shut down, redesigned and restarted as a company might shut down an underperforming vehicle plant to replace outdated equipment. This is the in effect the March's dilemma of exploring and exploiting: how to introduce systemic change while at the same time providing services described by laws and regulations.[27]

53.     Most public services must be continuously available. For public sector innovators, this makes for a particularly perplexing class of problem. It is both wicked, and also its basic function, and therefore shape, must be preserved. As empowering as Buckminster Fuller's instruction to "build a new model that makes the existing model obsolete" is in the face of this kind of problem, many public services cannot be made obsolete. They can and should be continually 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.

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

55.     There are at least two reasons for education's resistance to large scale change beyond the fundamental issue of it being 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. And 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 10 year cycle, and in the last round (2016) was carefully organized to include

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[22] See case study on Micro-purchase platform p. 99 in Embracing Innovation in Government – Global Trends 2017
    http://www.oecd.org/gov/innovative-government/embracing-innovation-in-government.pdf

[23] Kelly 2005.
[24] Head 2010, 14.
[25] See in the context of public sector innovation measurement Kattel et al. 2015.
[26] Curtatone and Esposito 2014.
[27] March 1991; see also discussion in Lember et al. 2016.

the opinions of as many stakeholders as possible. While Finland's curriculum is an exemplary education policy and development process, it is a 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 instance. Second, authority is largely concentrated in central offices and other administrative bodies in most education systems. 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, but that their interests tend to turn backward toward 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 organize reform efforts around common goals. In other words, change cannot be systemic. It is always piecemeal and therefore not able to achieve the synergistic effects promised and demonstrated by systems approaches. Attempts are being made at making the "existing model obsolete" such as with the charter school movement in the US. But these remain marginal and have not achieved their promised innovation transfer into traditional education settings.

56.      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 provides rigidities and frictions that work against change, but are important to preserving the public interest. And, is it possible to work within the system to reform it or must something be done on the outside as well. Transformative change may require the spark of a crisis in order to significantly redesign an entrenched system.

57.      This, of course, all takes time and is akin to changing the tires while driving a car. In government, time is a scarce resource principally because of 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*

58.      Established institutions promote their own stability; they are by-and-large path-dependent and can be highly resistant to change. Look at any ministry whose origins dates back a century or more. They likely combine remits that no longer make sense today. For instance, in Finland the Ministry of Transport and Communications (LVM) had a combinatory logic compatible with a time when transportation and communications infrastructure were developed simultaneously. But today, transportation and communications (ICT) are only catching up to each other. Nevertheless, the concept of "transportation as a service" with a well-functioning communication infrastructure is emerging.[28] Also robotization and self-driving vehicles are changing the environment towards that direction.[29] While the problems the public sector faces today have changed considerably, established public institutions struggle to change. This is one of the core challenges of systems thinking in the public sector. It is critical to understand as prior analyses have shown that changing the architecture of the system can have a more profound impact than discrete policy interventions following ad hoc diagnosis of policy failures.[30]

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[28] Rapporteurs to explore the future of the transport and communications system, 2016.

[29] Pilli-Sihvola et al. 2015.

[30] See OECD 2015, 43 for references.

**Systems approaches to public service delivery: approaches and emerging evidence**

59.     In the introduction to this chapter the report discussed why applying system lenses to complex challenges faced by the public sector. Here the report tackles the question how systemic approaches have been applied to transformation of public service delivery.

60.     There have been several proponents of system thinking in the public sector[31] also in connection with the development and application of management theories to public service delivery. The shift in interest in system approaches is linked to the understanding of citizens as integral part of service delivery as 'co-producers' or 'co-creators', thus holding important information on the performance of the system.

61.     While there is no discrete list of characteristics of what good service delivery in the public sector means, there are some elements that have been outlined in literature. These include knowing the service users (their requirements, expectations, etc.), user-focused mindset, designing services according to the service user's needs and measuring the success from the viewpoint of end-users.[32] However, concentrating on discrete elements of public service delivery systems to reform (in connection to the service-dominant logic) have also received critique, as more profound system level problems are not brought to light.[33] This is especially important in the public sector due to the increasingly fragmented and inter-organizational context of public service delivery, where systems have become more complex and problems more difficult to deal with.[34] This means that changing the service delivery system for a single public sector organization or an agency may not deliver the desired effect.

62.     On example of system thinking applied in service delivery is the Vanguard Method (following Seddon's 'Check-Plan-Do' cycle) developed for use in service organizations. This method identifies two different types of demand in service organizations: *value demand* (what the organization 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 moves to checking capabilities and rebuilt the system in ways to eliminate redundancies and "waste" and focus on the processes that generate value for the user (see figure below).

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[31] These include Jake Chapman at Demos in the UK, 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. Also Donella Meadows' work has been used in the public sector context, but her perspective on systems theory and specifically leverage points was not specifically developed with public service delivery in mind.

[32] Osborne et al. 2013, 139.

[33] See Jung 2010; Powell et al. 2010.

[34] Osborne et al. 2013, 135.

**Figure 4. The Vanguard method for 'Check'**
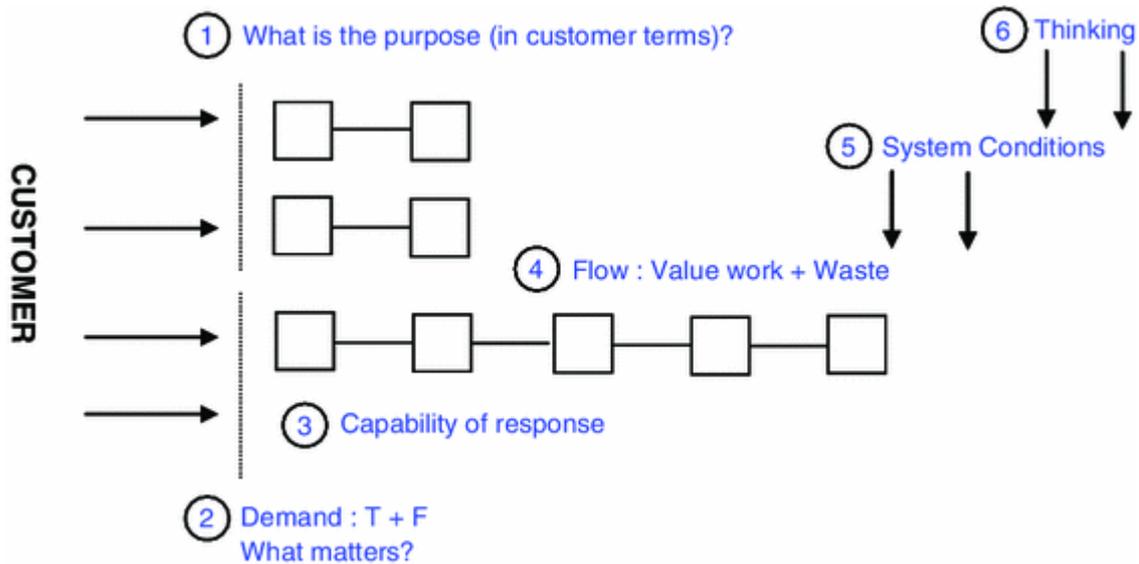
63.  The Vanguard Method has been applied to public sector organizations (an example from the Netherlands can be found in Box 4 below). The case of ChildProtect shows that implementing systematic change in the public sector takes time, but it can also have very positive outcomes. The Vanguard method in particular gives practitioners a chance to go through individual learning processes that are needed in order to change their institutional processes.

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**Box 15. Child Protection in Greater Amsterdam**

Jeugdbescherming Regio Amsterdam (in English: Child and Youth Protection Services in the Amsterdam area (CYPSA))  is the public youth protection agency of Amsterdam (Netherlands). On a yearly basis it looks after 10 000 children at risk with the help of 600 staff. In 2008 the agency was put 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 larger re-design of the organization was initiated to keep 'Every child safe'. A core group of ten caseworkers, two team managers, two psychologists and a consultant trained in the Vanguard method and were given authority to redesign internal processes.

In three months, the group went through the "check", "plan" and "do" phases of the Vanguard method and delivered a way of working approach ("doing" what was "planned"). The check showed that CYPSA was split organizationally across different roles (social workers working with parents on voluntary bases, guardians who had legal responsibility over the children and parole officers working together with convicted juvenile offenders. Hence, there was not a single contact point for the family. Therefore, caseworkers were unsure who was supposed to act on signals of unsafety of children. Caseworkers dealt with established protocols and reporting that was not central to the mission at hand—keeping children safe.  In the planning phase, new basic principles of action were discussed: a caseworker should deal with the whole family system, directly communicate with families (the "Functional Family Parole Services"), and phases of engagement were outlined. Previous silos were to be abolished and replaced with teams that were organized around any potential case. New focus was put on early intervention and holistic care of the entire family.

After the initial analysis was completed, three similar teams of volunteers started and were given three weeks to go through the process building on previous findings, while undergoing their own learning process at the same time. This was followed by a 'rolling-in' process where 40 teams were taken through the process so that they could experience their own check, plan, do phases. This took a full year and required additional changes to supporting

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> services such as IT, facilities, etc.
>
> The whole process exceeded its initial expectation: it improved both the quality of the public service and diminished the connected costs. For example, the number of cases where children had to be forcibly removed from families decreased by 50%. The changes reportedly resulted in cost savings of 30 million EUR annually. In 2015 CYPSA was elected the Best Public Sector Organization in the Netherlands.
>
> The case study is developed in full later on in the report.
>
> Source: Wauters and Drinkgreve 2016.

64.     While there is case-specific evidence that systems approaches have been applied in the public sector, there are no systematic reviews on how these approaches, including the Vanguard model, have used in the public sector and how successful they have been. Public sector organizations tend not to make public, specificities of reform processes *a priori*. Consequently, there is also no specific research on which specific systems approach fits a specific context. Nevertheless, systems approaches have been applied across various fields in both social research, and also in action research. For example, systems thinking has been applied to address:

- childhood obesity and social policy in Australia[35]

- child protection in England[36]

- design/management of children's services departments in England and Wales[37]

- health prevention from obesity to tobacco,[38] mental health services in North Wales[39] and more generally public health[40] (WHO has used systems thinking in health systems reform)[41]

- higher education in the UK[42]

- environmental follow-up in Sweden,[43] waste oil management in Finland[44] and sustainable food consumption in Norway[45]

- infrastructure planning in Australia[46]

- and in some cases even in military and political affairs in the US[47]

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[35] Allender et al. 2015; Canty-Waldron 2014.
[36] Lane et al. 2016.
[37] Gibson and O'Donovan 2014.
[38] See overview of obesity policy in Johnston et al. 2014; Bures et al. 2014.
[39] Evans et al. 2013.
[40] See review of relevant papers in Carey et al. 2015.
[41] WHO 2009.
[42] Dunnion and O'Donovan 2014.
[43] Lundberg 2011.
[44] Kapustina et al. 2014.
[45] Vitterso and Tangeland 2015.
[46] Pepper et al. 2016.
[47] US State Dept. Bureau of Political-Military Affairs

65.      One of the most well-known systems exercises in the public sector is the Munro Review (see Box below). It utilized a multitude of systems approaches without devising a concrete methodology (in comparison to the Vanguard model) with the aim to show how different reforms interact, what were the effects on the objectives of the system before devising a narrative account of what needed to be changed in the child protection system. While the review was widely covered by the media and received positive reactions from practitioners, it was not straightforward to implement the recommendations in practice. It was time-consuming and complex as many actors were involved in order to change public policy systems. For example, in the process of organizational redesign, authority may be needed to transfer from one organization to another. In the public sector context this often means 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 taking into account desired moving patterns.

66.      Prior research has shown that without proper training and clear guidelines, practitioners turn back to previous delivery models even if systems approaches are used to re-evaluate public service conditions.[48] This is in effect, human nature. But, unwillingness to embrace new ways of working continues to be one of the biggest barriers to change in the public sector.[49] Furthermore, there can be active resistance to change and political lobbying against reform from powerful incumbents as is the case in energy sector especially.

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**Box 16. 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. The Department of Education commissioned an independent review to reform the child protection system in 2010 from Professor Eileen Munro.

The goal was to understand why policies were not yielding expected results in protecting children from abuse and neglect and to design a new system of child protection based on new insights. The central question in the analysis was: "what helps professionals make the best judgments possible to protect a vulnerable child?" The analysis outlined how the system had become over-bureaucratized 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 steps: first, in 2010 a 'Systems Analysis' of the current child protection system was released. This was purposely analytical, aimed at policy makers showing how reforms interact and the effect these interactions were having on institutional practices. The second report, 'The child's journey' published in 2011 outlined the child's experience in the system from needing to receiving help. This report also outlined the need to work with children and families who have not yet met the threshold for child protection. With extensive consultation the final report outlined how to develop a more child-centered system of child protection together with a flexible assessment system.

The review used causal loop diagrams (CLDs) to communicate how causal relationships in the child protection system worked and visualize how the 'compliance culture' had evolved. Furthermore, several other concepts from systems theory were used in the review: single and double loop learning, ripple effects, requisite variety, socio-technical systems, etc.

Following the Review, the Secretary of State for Education issued eight trials of the recommendations and this unearthed unintended consequences due to exogenous factors: rocketing caseloads and public sector cuts.[50] Further, roll-out of the system was postponed due to government delays in changing statutory guidance.

Source: Munro 2010; 2011ab.

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[48] see Carey et al. 2015, 4.
[49] NAO 2006.
[50] Munro and Lushey 2012.

67.     While there are no concrete characteristics of what inhibits systems level change in the public sector, broader public sector change and innovation literature is very indicative here. There are several factors that can inhibit systems change in the public sector. These include: unwillingness of managers to take risk,[51] possible political scrutiny from opposing parties,[52] short-term delivery pressures, and organizational culture in the public sector and low levels of management autonomy.[53] Prominent systems thinker, Jake Chapman has outlined some of these characteristics connected to systems failure in policy making:[54]

- 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

- and loss of professional integrity and autonomy under the knife of efficiency

68.     Some of these factors are not uniform across the public sector. For example, in some countries discretionary learning (staff taking responsibility and exercising agency to solve problems) is higher and this helps to introduce bottom up systems level change.[55] Or if institutions are not that mature or are still developing, they are more receptive to change, thus, making fundamental systems level change more likely in administrative context with less path-dependencies. Usually practitioners and public sector managers have little control over organizational culture after it has segmented or become institutionalized, thus, existing high systems or even policy capacity can be a pre-determining factor for instigating systems level change. Different government functions divided into a 'silo system' can have large path-dependencies which can become a large barrier to change public service delivery systems.[56] Hence, many public sector organizations (as describe above) are ill-equipped to deal with new, complex and wicked problems.

69.     Faced with many contextual problems, is there room for systems approaches in the public sector? How can system change be introduced into the public sector? There are only a handful of surveys exploring these questions: a survey from the US from 2001 showed that 50% of the innovations were initiated by front-line staff and middle managers, 70% were a response to a crisis and specifically 60% resulted due to austerity measures.[57] Indeed, in many cases political opportunities to create momentum for system level change stem from crisis.[58] Thus, crises have been found to drive innovation and change in the

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[51] e.g., Osborne and Brown 2011; Torugsa and Arundel 2015.
[52] Potts and Kastelle 2010.
[53] Lægreid et al. 2011; Bysted and Jespersen 2014.
[54] Chapman 2002, 13.
[55] Kaasa 2013; Arundel et al. 2015.
[56] Bason 2010.
[57] Bornis 2001.
[58] McCann 2013.

public sector.[59] Consequently, crisis—both physical emergence, perceived threat or public uproar—can be a window of opportunity to use systems approaches in the public sector, 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 core purposes of programs or services. By questioning—and reasserting—purpose, an administration opens an opportunity to redesign not only their services, but how those services are resourced, managed and renewed if and when the crisis recedes.

70.      But as outlined above, systems approaches should be a continuous, dialogic process; policy makers should not wait for political crisis to implement change. In static, business-as-usual conditions, there should be opportunities opened for systems approaches in the public sector. Regardless of different types of public sector organizations and context, there is evidence that policy entrepreneurs—committed leaders—can create space for change in any institutional context.[60] Consequently, it has been proven possible to overcome budget and temporal uncertainty and restrictions if practitioners have the will to change work toward the transformation of a system.[61] Personal leadership and commitment of key individuals is an important factor in supporting successful change in the public sector,[62] even if it can be piecemeal at times. What matters is that work towards systems change is initiated and sustained as fully as possible. Strategies that open up organizations and support outside collaboration with enterprises, citizens, etc. also enforce organizational learning and help speed and spread the adoption of change.[63] Nevertheless, a broader engagement with systems approaches may require a substantive shift in the culture and operations of public organizations.

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[59] See Kay and Goldspink 2012.
[60] Leonard 2010.
[61] Torugsa and Arundel 2015.
[62] Pärna and von Tunzelmann 2007.
[63] Walker 2013.

# TOWARD A FRAMEWORK FOR SYSTEMS TRANSFORMATION

## New systems-based practices

71.      Innovative approaches to problem solving and service delivery are proliferating across governments as they contend with complex problems for which there are few precedent solutions. At the same time, front line public servants face "customers" who have come to expect tailored, responsive products and services that they routinely experience from business, especially the tech industry.

72.      In the vacuum left by command and control systems inability to cope with these demands, new systems based practices are stepping in. Many of these efforts remain however at the margins—often organized into "labs" that have the space and mandate to innovate government processes. But they have yet to move toward the center of government or begin to tackle the norms and standards that dictate the behavior of civil servants. The following are some on the notable efforts in promoting system based practices:

- Nesta has long worked to build an ecosystem of systems and design-based practices around government with its social innovation programs, i-teams, Creative Councils, among others.

- Sitra's Helsinki Design Lab, Strategy Unit and partnerships with organizations such as Demos Helsinki have not only deployed systems approaches on issues such as clean tech and urban decarbonization, but also worked to develop the theoretical and practical underpinnings of systems approaches and strategic design.

- MaRS Discovery District in Toronto brings in organizations and businesses with the potential to be change agents, and helps to build their capacity and expertise. Embedded in MaRS, 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 25 in case study p 86) 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 (OPM) Lab@OPM works to spread design and systems based practices and tools across government through training programs for government workers and contractors, while providing a platform to bring together other Federal agencies to address complex challenges.

- MindLab, Denmark's cross government innovation group foregrounds the importance of citizen involvement, voice and co-creation, which necessitates systems approaches. MindLab's staff includes designers, sociologists, ethnographers and others who work blended teams together with citizens.

- The Australian Centre for Social Innovation, TACSI, a not-for-profit funded by government, applies design and social research in co-creative processes to tackle difficult social, economic and environmental problems. They look for ways to crack "open the current system at crisis points"64 and develop new services that meet unmet or neglected needs. Their well-known

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[64] Nesta 2014

"Family by Family" project is a good example of this approach. In working to address the seemingly intractable problem of dysfunctional families, TACSI aimed at reducing growing demands on social services by pairing families that had overcome crisis with families currently in the midst of crisis. Their critical insight was not first ask how to mitigate chronic stress, but what might a successful family in difficult circumstances look like. Once the target was thriving families, not mitigation, better, more impactful services could be designed.

### Systems thinking and design thinking: different but complementary approaches

73.     Currently there is a surge of interest in *design thinking* in the public sector especially in connection to co-designing public services together with citizens through participatory processes.[65] One only needs to observe the proliferation of "sticky notes" in government offices to confirm this shift. However, the interlinkages between service design and systems thinking have to made clear especially in the emergence of 'design thinking'[66] and design management.[67] The former denotes the use of design methods to match consumer needs and value with what is viable both technologically but also for business strategy.[68] Design management is more geared towards prototyping, but some approaches also include clear elements from systems thinking (e.g. methods such as understanding user experiences, ideation, rapid prototyping, visualization and also systems).[69]

74.     With the increased popularity of 'design thinking' the policy realm has also proliferated with different toolboxes and guides on how to use design and design thinking in the public sector and sometimes these mention systems thinking together with design tools.[70] In general, these methodologies try to rationalize change processes within the public sector and are therefore reductionist to a degree. By definition, tools and tool kits that are divorced from the underlying principles that were used to create them is a reductionist approach even when labeled "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 against contextual demands and user needs in practice, and not against archetypical situations.

75.     However, there is no clear-cut definition how these approaches—systems thinking and design thinking—fit together. In some publications system thinking is regarded as a part of a larger design skill-set.[71] At the same time, others apply design as a tool in a larger systems thinking approach.[72] The origins of systems thinking and design thinking are clearly different—design thinking originating from product design approaches[73] and design more broadly from architecture and product design—but they are interlinked concepts. Thus, design as a concept was already used by systems thinkers in the 1980s, albeit more as a 'problem solving tool'.[74] What is important to note is that *systems thinking is not only systematic design*. Systems thinking at its core is oriented towards organizational learning, reflection in action. At the same time, the narrow focus on systematic design is often how systems thinking is applied in practice.[75]

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[65] See e.g., the wealth of material on UK's Design Council also on public services: http://www.designcouncil.org.uk/resources/search/im_field_objective/public-services-486
[66] Rowe 1987.
[67] See e.g., Cooper et al. 2009.
[68] See Brown 2008, Martin 2009.
[69] Mulgan 2014.
[70] See for example materials on: http://social-labs.com/toolkits/
[71] Mulgan 2014.
[72] See e.g. Gharajedaghi 2011.
[73] This is largely attributed to David Kelley and IDEO Design. See further Kelley and VanPatter 2005.
[74] E.g., Argyris and Schön, 1978; Ackoff 1981.
[75] Li 2002, 387.

76.    Design is a useful bridge to integrate systems thinking into everyday organizational learning.[76] Hence, some see the popularity of design thinking combined with evidence based policy making as a way to rejuvenate interest in systems thinking in the public sector.[77] Still, design thinking tends to deal with events, problems and the application of tools (we have all be subject to the sticky not storms of "creative problem solving"). It concentrates on action, prototyping ('thinking through doing') and usually it is considered to belong to Simon's rational-technical problem solving logic.[78] In many cases, the feedback loop from an implementation phase is weak (which is a clear break from traditional design practices). Furthermore, with rational problem solving, more complex changes in value distribution may be left unaccounted for as policy makers can choose the solution that satisfies current conditions which may not be the best solution.[79] Hence, one can end up with piecemeal solutions on the surface of underlying structural policy problems. Service designers concentrating on second or third order design problems directly connected to user needs may neglect to deal with fourth order design problems[80]—systems integration—linked most often to wicked problems.[81]

77.    For example, design methodologies employed by public sector innovation labs use rapid prototyping often, however, many of these solutions do not fit with the broader public service system.[82] Thus, it is difficult to move beyond experimentation to long-term exploration.[83] This can be exemplified by the Government of Alberta CoLab's systemic design guide (Box 6). While they use many systems thinking tools, they not deal with the implementation process, which in the public policy context can be the most difficult part due to feedback from traditional institutions, established bureaucratic procedures and short political lifecycles.

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**Box 17. CoLab's Systemic Design Field Guide (Australia)**

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

The CoLab outlines five key characteristics of systemic designers: they are inquiring, open, integrative, collaborative and centered. It adopts a simple formula: playfulness + discipline = creativity.

The guide goes through 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 map, keep asking why, ethnography), "frame" (rich pictures, systems maps, iceberg diagrams, CLDs, concept maps, six thinking hats, speed dating, affinity diagrams, card sorts, world cafes), "generate" (participatory prototyping, dotmocracy) and "adapt" (reflection and action space).

In the planning phase, the nature of the problem should be outlined—if it is not a complex problem, than systemic design approach would be "overkill". Additional important questions to consider: is the client open to change, does the client have "top cover" (senior level champion) and is the client committed (with resources, willing to implement the project), and most critically, do we even know who the client is? During the workshops sequencing is important (bringing in external perspectives, ideation, testing, integrating findings, evaluating processes, implementing and sharing results, maintaining momentum during workshops). There are some specific roles that should be fulfilled in

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[76] Ibid. 392.
[77] Wastell 2010.
[78] Dorst and Royakkers 2006.
[79] Ibid.
[80] Defined by Buchanan 2001 the four orders of design are symbols, things, actions, thoughts with the corresponding design areas graphic design, industrial design, interaction design, and environmental design.
[81] Junginger 2014, 148-149.
[82] Tõnurist et al. 2015.
[83] In the context of social innovation see Brown and Wyatt 2010.

workshops: facilitator (usually an outside designer), recorder, note taker, narrator. The workshop is followed by an evaluation and after a few months a check back to see if anything has happened since the get together. The approach is design centered, focuses on the workshops and does not go into implementation.

78.        Systems thinking helps to put a managerial problem into context, into systems events, patterns and structures rather than events alone for which design solutions are applied.[84] At the same time, systems thinking can overemphasize the analysis ('thinking it through') and gets into trouble by ignoring action. Consequently, both approaches can complement each other in practice. The danger is that both approaches tend to become too rigid in applying their own specific methodologies and thus, limit their use in broader policy making circles.

79.        Design has always been concerned with the interaction between people and things. For much of its history, these things 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 toward human centered policy and services. Human centered design (HCD), strategic design, design thinking and other variations have gained traction in many administrations moving to reorient 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 options for the public sector?**

80.        Complexity arises when systems are not configured to respond to the challenge 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[85]. For instance, 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 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 available to the public by simplifying the tax regime itself.[86] In essence, reduced variety on the regulatory side will result in a reduced number of responses by the regulated. Ashby's law may be the most important principle to consider when working on—and especially developing interventions for—complex systems.

81.        Complexity scholars Max Boisot and Bill McKelvey have returned to Ashby's law and applied it to the contemporary debate around managing organizations 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."[87] With respect to managing complexity, organizations have two principal adaptation strategies. The first strategy is to simplify or reduce the complexity of incoming stimuli so as to keep internal complexity minimized. This *complexity reduction* can be done

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[84] See discussion in Dunne and Martin 2006.

[85] In 1956 the cybernetician W. Ross Ashby published *An Introduction to Cybernetics* wherein he described the internal order of a system to be 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 recast by Stafford Beer to 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 it has 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 (http://pespmc1.vub.ac.be/REQVAR.html)

[86] Casti 2012, 56.

[87] McKelvey & Boisot 2009

through abstraction such as 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 securitization of residential mortgages shielded unaccounted risks leading to the global financial crisis. Examples from the public sector abound, but at a systemic level, the organization of domain authority into ministries is a form of simplification or complexity reduction. For instance, housing sector is responsible for a significant portion of energy consumption, and that behaviors drive energy usage, yet governments have formed separately a Department of Housing, a Department of Energy and a Department of Human Services. This artificial segmentation of problem spaces reduces complexity, but also limits the degree to which any single organization can understand and take action on systemic challenges. Here there is a complexity gap between a problem such as climate change, and the government's ability to address it holistically.

82.      The second strategy is *complexity absorption* wherein organizations create internal complexity that is determined to be equal or greater than the external complexity that it faces. Complexity absorption leads to requisite variety which in the best case permits an organization to be adaptive, opening up new kinds of strategic options.[88] But there are risks too: resources can be quickly depleted as the organization grows in size or diversity,[89] and possibly becomes too complex itself 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 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. But of course the persistent challenge of big data is the ability to understand and take action on vast amounts of new information; complexity begets complexity.

83.      Boisot and McKelvey describe these interrelated strategies of complexity reduction and complexity absorption and the trade-offs inherent between them as the *Ashby Space*.[90] Figure 6 (adapted from Boisot and McKelvey) 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 organization's responses (internal complexity) matches the incoming stimuli (external complexity). According to Ashby, equilibrium can be achieved through some form of regulation.[91]

84.      It follows then that *regulation* is the key task of organizations 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…".[92]

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[88] Hämäläinen 2015
[89] Boisot & McKelvey 2011
[90] ibid.
[91] Ashby 1956
[92] Boisot & McKelvey 2011: 284

**Figure 5. The Ashby Space**



THE ASHBY SPACE

REQUISITE VARIETY

HIGH

COMPLEXITY ABSORPTION

● ORGANIZATION

COMPLEXITY REDUCTION

EXTERNAL COMPLEXITY

DESIGN

MULTIPLIER, SYNTHESIS, PROTOTYPE

PROBLEM FRAMING, VISUALIZATION, ETC

LOW

INTERNAL COMPLEXITY

HIGH

adapted from: Boisot & McKelvey 2011

source: Justin W. Cook 2016
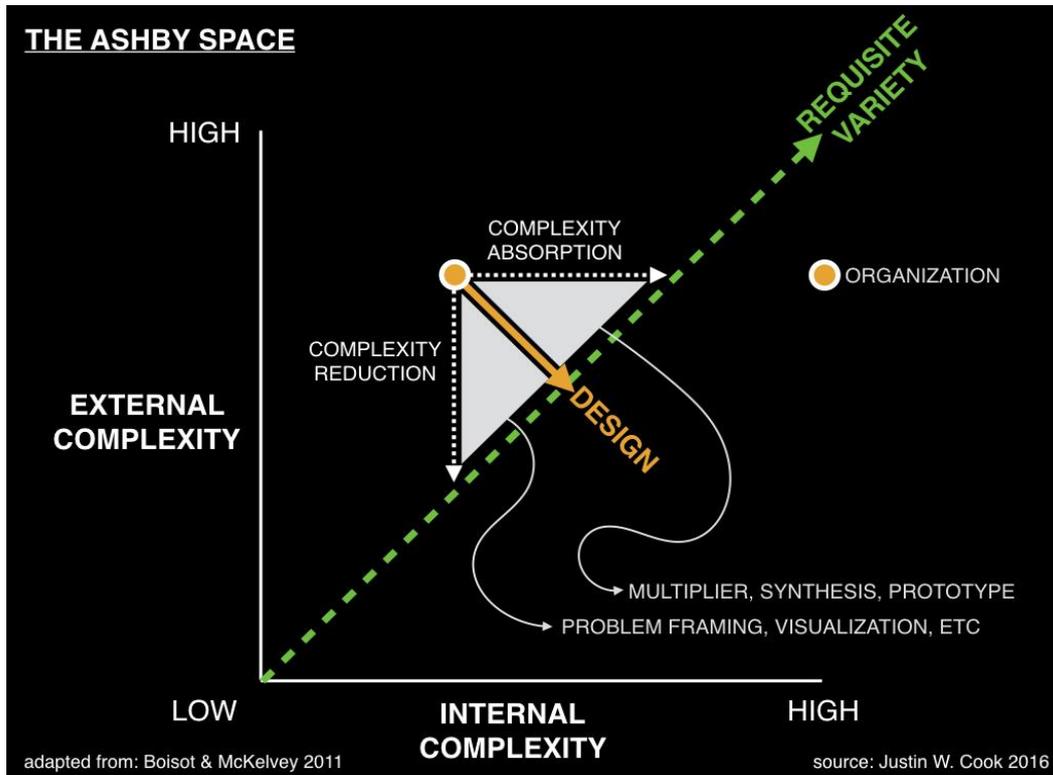
Source: Boisot and McKelvey 2011.

85.        Figure 5  illustrates an organization experiencing high levels of external complexity 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 organizations not facing crisis and may be altogether impossible due to the interconnectedness of today's challenges.

86.        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 specifically enables an organization 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 suggests as much. While design methodologies still remain largely marginal to more firmly established strategy processes, a shift is underway that is pushing designers deep into organizations, 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 the opportunity to engage self-adaptive systems directly.[93]

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[93] http://jods.mitpress.mit.edu/pub/designandscience

**Figure 6. Three Complexity Regimes**
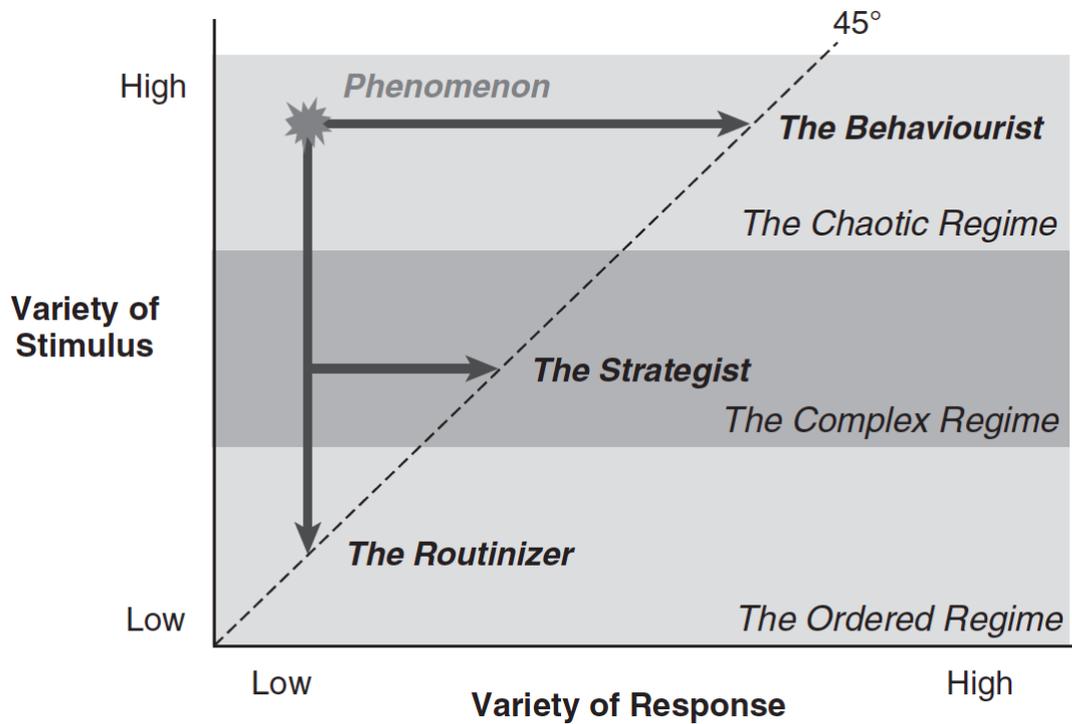


Source: Boisot and McKelvey 2011.

87.     Design has traditionally worked to make sense of complexity through problem framing, visualization, ethnographic practices, working with relative precision and across disciplinary cultures, etc. These methodologies do not artificially simplify complexity, but aim to contextualize 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 organization (complexity absorption), design allows for variety to be explored and exploited *within the process itself*. By optimizing between reduction and absorption strategies, design and systems approaches transit the Ashby Space more productively toward requisite variety, enabling what Boisot and McKelvey termed the *complex regime* (Figure 6) where complexity can be embraced and successful schema can be developed. The following sections will explore in greater detail systems approaches and design methodologies that have proven effective within the Ashby Space.

88.     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, organizations 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 carries significant risks associated with decisions that can worsen outcomes. For instance, in the aftermath of Hurricane Katrina that devastated New Orleans in 2005, the Federal Emergency Management Agency (FEMA) supplied thousands of what came to be known as FEMA Trailers, which were mobile units intended to provide temporary housing. While this quick reaction provided housing relief for those that lost their homes, many of the trailers contained dangerous levels of

formaldehyde that caused significant health issues. Worse still, as of 2015—a decade after the crisis—people continue to occupy FEMA trailers,[94] suggesting an inherent conflict or error in what was designed to be a short term solution. Alternative examples of progressive, productive reactions to crisis exist as well. 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 demonstrates that a systemic, inclusive, co-created solution to redesigning and rebuilding an entire city can be done both efficiently and successfully.[95]

89.      In 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 complexity absorption for an administrative body charged with managing global affairs for the US Government. However, just as departmentalization 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 (for instance the absence of a large scale conflict such as WWII or the rise of polarizing adversary such as the USSR), organizations such as 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 organization create an opportunity to transit the Ashby space toward requisite variety when there is not an external stimulus that forces action.

**Working with relative precision**

90.      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 realized either through strict regulations on policy design and implementation. Or tacitly, through behavioral 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 healthcare 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 not clear if the evidence fully informs policy or if decision makers are able to comprehend evidence because of 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. And evidence itself can be politicized; accepted by some as science, 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.[96]

91.      Enter then, wicked problems. As discussed above, wicked problems are emergent meaning that they result from the interaction of smaller subsystems. Typically, it is at the level of the subsystem that science and evidence creation are most effective and precise. For instance, the cognitive development of children can well be 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

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[94] http://grist.org/politics/people-are-still-living-in-femas-toxic-katrina-trailers-and-they-likely-have-no-idea/

[95] Boyer, Cook & Steinberg 2013, 25.

[96] See The Alliance for Useful Evidence.

science approach to policy making, much work must be done to develop the field before it can be widely applied.[97]

92.    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. In order for barriers stemming from uncertainty to be overcome, knowledge about a wicked problem must be comparatively appraised. In practice this means treating qualitative and quantitative data with equal rigor 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, intuition is a critical skill that is 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 have a sense about how things fit together.[98] The latter, testing, is also dependent on the former to the extent that it requires experience to know how to test ideas efficiently and productively.

**Figure 7. Picasso's "Bull" Lithographs, 1945**



Source: P. Picasso https://www.flickr.com/photos/sorarium/8578925321
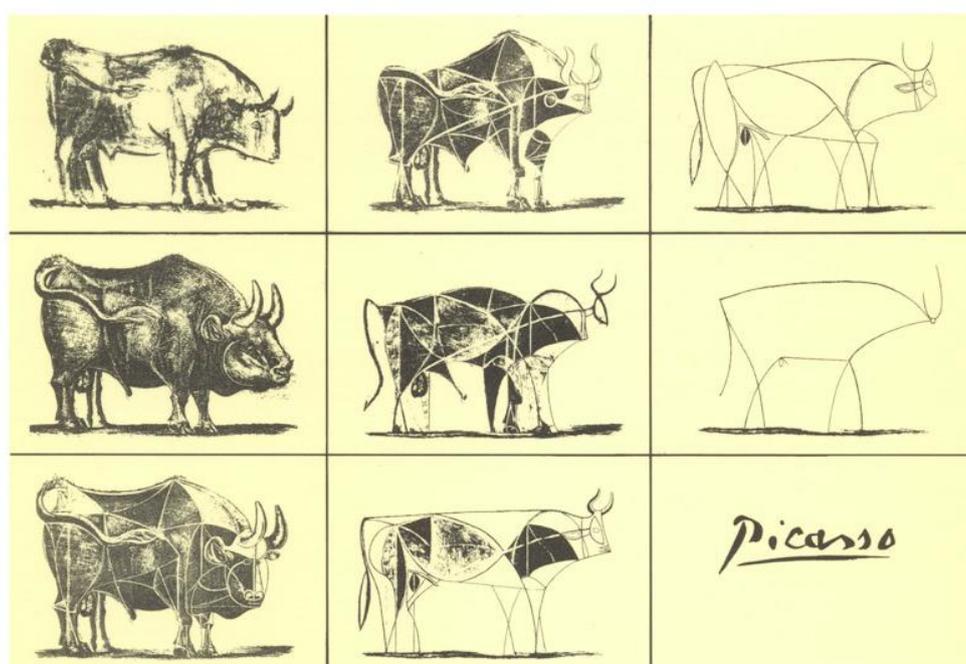
93.    Visualization is also an effective tool for working with relative precision. In its most common form visualization is the sketch. Sketching allows the rapid transposition of ideas to paper, recording concepts while still allowing for addition, subtraction and interpretation. Precision can be increased or decreased in several ways. For instance, Figure 7 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 distill 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

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[97]    See    Sitra/IFF's    report    "Second    Order    Science    and    Policy" http://www.decisionintegrity.co.uk/SOSP%20Report%20Final%20June%202016.pdf
[98] Boyer, Cook & Steinberg 2011: 37.

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 visualization 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 in process. Narrative can be difficult to re-contextualize, as anyone who has thought, "that seemed like such a good idea at the time" can attest.

94.     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, etc. 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 risk of failure. This approach is productive when variables are known, but virtually impossible when working with wicked problems.

95.     A pre-factual process enables an *open-ended solution* to be developed yielding at least two principal benefits. First, developing a solution early 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**

96.     This section will outline a systems transformation process stemming from the authors' experience and case study research. Each subsection will outline in general terms key elements of success. Greater specificity will be 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 unique which prohibits many 1:1 comparisons between systems tactics. However, strategy and principles should be transferrable despite 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 for further analysis.

*People & Place*

97.     While the value of having good people working in supportive spaces may seem obvious, it is so often 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 startup or established, innovative company. The same is true when applying systems approaches to complex problems.

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

99.     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 for the value and purpose of change helps 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 any single discipline that creates an optimum solution based

on their tools and worldview. Multiple arenas of deep knowledge must be integrated, even when it is 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. And loose fits are common under uncertain conditions, but they should not be feared or forced into greater conformity.

100.    It is also useful to bring in external expertise that becomes embedded in a team for a fixed period. For instance, the Collaboratory at the US Dept. of State hired a Rhode Island School of Design trained designer to come in as a contractor and bring a new set of skills to help build out a new platform for collaboration. Or, at the Finnish Innovation Fund (Sitra), members of the Strategy Unit have joined the Prime Minister's Office and Ministry of Economic Affairs and Employment for fixed terms to both bring new ways of working and thinking into government, but also improve Sitra's intelligence about how government operates. These "exchange programs" allow an expansion of ways of working and cultural norms that provides a space for new practices to emerge.

101.    It must be recognized at the outset that for some, a 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 insight 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 a new system.

102.    Place is also important as it signifies the investment an institution is making into process. Working in an isolated basement versus a public space closely connected to the heart of an organization 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 the psychological and physical comforts provides teams a baseline sense of wellbeing that will help them overcome obstacles such as the frustration that is a normal byproduct of ambiguity. It can be simple: remarkable effects can be realized when managers provide employees with access to decent coffee and good food. Google, Facebook and others learned this to their benefit long ago.

103.    Working space must also enable dedicated, long-term collaboration. Given the complexity of systems approaches, it is not reasonable to hold all of the critical information in one's mind at all times. Having visualizations, artifacts, reports, images, etc. pinned to the walls of a workspace can spur new, connective thinking as a project unfolds.

*Dwelling*

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

105.    For instance, *civics* is a concept and practice that has been central to the American understanding of duties one has 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. Using the Google NGram Viewer which searches for the frequency of terms present in the vast Google Books library, civics was a term actively used through the world wars 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 gone unrenewed for half a century. Meanwhile, technology, identity politics, and structural changes have pushed Americans away from their government and one another.

106.     Dwelling means investing the 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 rely too much on tacit knowledge. To unpack the tacit dimensions of understanding and minimize 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.

107.     Systems change and especially design processes often begin with a conversation about purpose. Defining the purpose of something helps one understand why something should exist and how best to achieve it. But for so 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 do we educate our children? Or healthcare: is its purpose to extend life or improve wellbeing? This can't be known until a debate on purpose happen. Time assigned to dwelling enables 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.

108.     In the language and practice of design, dwelling is often described as divergence or exploration. This phase is then followed by subsequent phases of defining what has been learned, or convergence. The UK Design Council's famous *Double Diamond* diagram captures this notion well (Figure 8).

**Figure 8. Double Diamond**
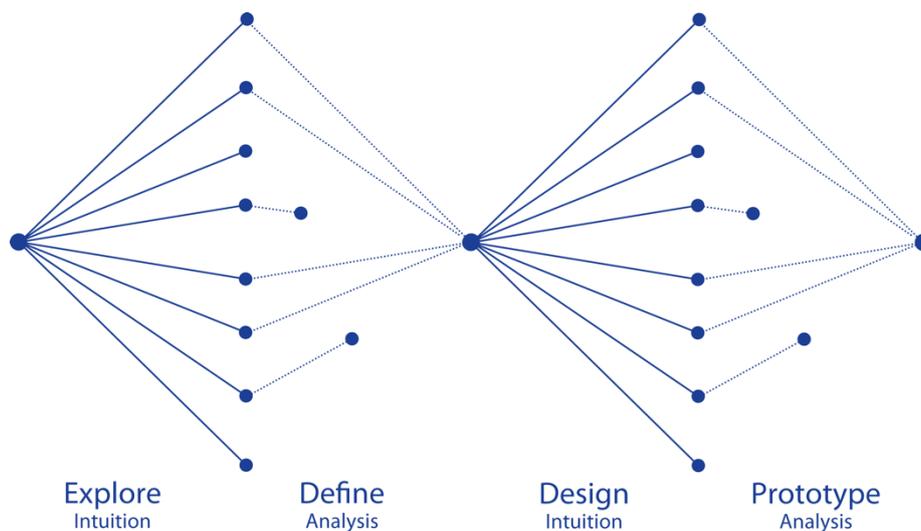


Source: Adapted from Helsinki Design Lab (2010) and UK Design Council.

109.     Dwelling also suggests that alternate means of coping with information may be required. For instance, 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 analyzed through multiple lenses. Models may have to be built to illuminate relationships and expose gaps. This takes time and resources, and it dedicates them to a phase of work that may not produce timely or obvious results. Here, dwelling is a form of due diligence for complex systems that will pay dividends in later stages by accelerating the ability to make meaningful propositions.

110.     In a public sector context, dwelling can be enabled through engagement processes where officials interact in context with citizens and other stakeholders to understand their lived experience (discussed in the next section). The key is then spending the time aligning what is learned in the field with what is understood to be the limits and opportunities present in a system, with a given problem set. For instance, if an administration is interested in developing better services for aging populations, it is usually not enough to gather more data from constituents. This data must be made actionable by developing new principles, frameworks or logics from it that can then be worked from as interventions are designed. Making information actionable requires the ability and resources to be reflective, which is here called dwelling.

*Connecting*

111.     To understand citizens, it is essential to get close to them; to see their lives, their desires, their fears, 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. To connect, engagements with citizens must be meaningful, generative and respectful, not arms-length instruments such as surveys. Connecting takes time and resources, and tools such as videography that may not be readily available or familiar. Working with citizens in co-creative processes can be unpredictable and can yield results that are counter to what is deemed acceptable or desirable by an administration. Careful facilitation is also required. In the best case, good facilitation destabilizes authority and expertise so that controversial issues can be explored and captured more completely as citizens feel free to challenge political and business interests.[99]

112.     The kind of knowledge generated by connecting with people is perhaps equally challenging as it doesn't enjoy the same universality as quantitative knowledge. Centuries of parsing economic data has led to extreme facility of its uptake and use in driving decision making. But what about less structured, qualitative data? How can decision makers confront a narrative, have strategic conversations and then reach unbiased decisions about policy and services? These questions sit at the center of every discussion that leads to the traditional approach of mild, distant citizen engagement.

113.     However, the social science ethnography provides critical capabilities that allow qualitative data to be worked with 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 tenants in the academy, "ethnography light" can still be a rigorous observational and analytic practice. A deeper examination is beyond the scope of this study.[100] However, when considering an ethnographic approach it is critical to keep in mind that observation is not a passive process.[101] As one Brown University ethnographer said, "ethnography means making the strange familiar and the familiar strange"[102] meaning in the act of observing, one must recognize the implications of their presence and the role interpretation and bias will play in reaching conclusions.

114.     In connecting with citizens, it is also critical that a diverse representation of the public be involved. Without diversity, even the best co-creative processes can mirror standard engagement practices which tend to bias proximal or known stakeholders. This 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.

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[99] See Helsinki Design Lab's writing on Hybrid Forums. http://www.helsinkidesignlab.org/blog/hybrid-forums-for-urban-controversies-the-ten-commandments

[100] Ethnography has many variations including Hybrid Forums (see Michel Callon et al *Acting in an Uncertain World*. See also the vast sphere of co-creative processes aimed at connecting authentically to citizens.

[101] https://www.research-live.com/article/opinion/ethnography-caught-between-myths

[102] Sarah Besky, lecture at RISD Institute for Design and Public Policy, 2016.

**Figure 9. The process for experiment**
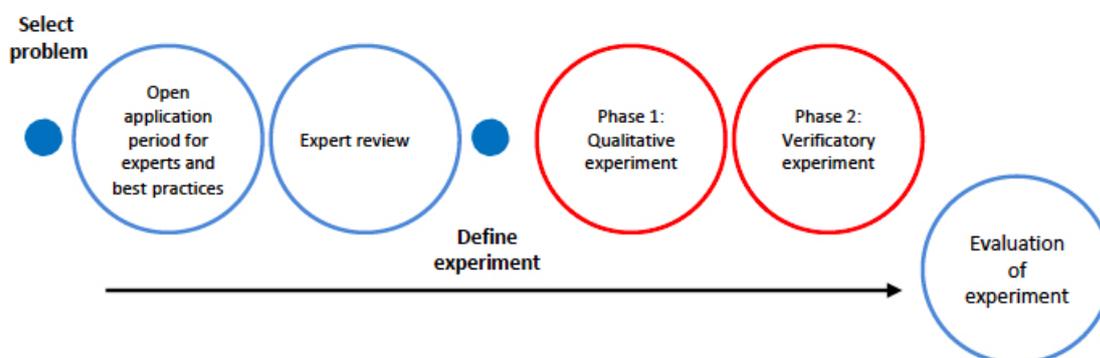


Source: Demos Helsinki 2015.

115.	For public service managers, connecting can be done with a variety of tools that exist on a spectrum from low-touch to high-touch. On the low side, questionnaires mailed or sent electronically can provide basic information from those who opt to be involved. On the high side, heavily facilitated co-creation processes can engage citizens on a deep level, raising the possibility (and risk if not realized) 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 an experimentation platform for citizens together with the think tank Demos Helsinki. The objective is to crowdsource strong ideas for how to improve Finland, develop the ideas into experimental proposals and scale the proposals if successful (see Figure 9 and case study p. 60).[103] This form of connecting engages citizens so that they have a shared responsibility in the work and success of government.

*Framing*

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

117.	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. For instance, consider a physics teacher wanting her students to gain greater proficiency of core scientific principles. One framing option is to design better exercises that cover principles more comprehensively. Another framing option 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.

118.	Problem frames link the desired outcome with a definition of how a solution might be organized (the patterns of relationships between parts). It leaves out the specific elements that will be deployed as those are determined after a problem frame appears promising.[104] Framing is a dynamic process where multiple outcomes and solutions are explored as an understanding of the problem, outcome and context

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[103]	http://www.demoshelsinki.fi/en/2015/12/08/this-is-why-finland-is-able-to-implement-the-basic-income-experiment/

[104] Dorst 2015: 53.

evolve and are refined. However, problem frames should be formulated with some attention paid to feasibility, especially within a highly regulated environment like public administrations. If the desired outcome and possible approaches are not aligned with the capacity of an institution or collaborative body, it can become disruptive.

119.    A related concept has been outlined for the management community by Hamel and Prahalad in Harvard Business Review. Their concept of *Strategic Intent* sets a course of action based on methods available and a desired outcome. As they state, "the goal of Strategic Intent is to fold the future back into the present… while [it] is clear about ends, it is flexible as to means." Within organizations, strategic intent provides a shared platform on which ideas can be explored and built into solutions while maintaining focus on overall objectives.[105] For the design community, strategic intent can be blended with other objectives such as targeting specific populations or developing durable products.

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

- Archeology: analysis the problem in depth as well as earlier attempts to solve it

- Paradox: investigate why the problem is hard to solve

- Context: explore key stakeholders of the problem and their environment, behaviors, etc.

- Field: examine the broader landscape surrounding the problem

- Themes: analyze and articulate deeper factors at play in the field

- Frames: investigate implications of possible actions given themes and outcome

- Futures: "think forward" to see if the frame will lead to viable solutions

- Transformation: critical evaluation of different solutions and their feasibility over time

- Integration: ensure frames & solutions can be well integrated into stakeholder organizations

121.    A lighter approach to problem framing is to ask a series How Might We (HMW) questions. HMWs are a common tool used in design thinking methodologies within corporations and consultancies. The trick is that the question avoids using phrases like "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 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.[106]

122.    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?"

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[105] Hamel, Prahalad 1999
[106] https://hbr.org/2012/09/the-secret-phrase-top-innovato

123.     Other approaches that share similar traits as framing include systems mapping and modeling, scenario planning, forecasting, design fiction, among others. The limitations of these methods is that they bias 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."[107]

124.     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 a few paragraphs. However, there are a few concepts that are useful in the context of wicked problems and public administrations working toward better public services.

125.     Design has two fundamental concerns: first to order information into concepts, logics and rationales and second, to create processes that produce useful outcomes.[108] Traditionally this has meant working through a set of constraints provided by a client to identify an approach, developing a novel solution and then a fabrication process that will produce the solution; say a chair or tea cup. For a world of wicked problems, design is proving an essential tool for *specifying intentions;* a critically important capacity when it can be hard to understand what problem is actually causing nocuous symptoms, let alone what must be done. Design has also always been operative at the intersection of intention and realization; 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.

126.     How to begin a design process? See the sections above. Then ask a few questions. Kees Dorst provides a simple equation[109] that has proven useful when facilitating teams of non-designers working to solve complex problems:

WHAT + HOW = OUTCOME

127.     Where WHAT are the elements such as people and things. HOW is the patterns of relationships or connections between the elements. And 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, if the "what" and "how" are known, then the outcome can be predicted.

128.     But design processes change the knowns in the equation:

???? + ???? = OUTCOME

129.     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".[110] This concept is especially useful with complex challenges because it may only be possible to determine the desired outcome; elements and how they fit together will then depend on a variety of other factors.

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[107] Boyer, Cook, & Steinberg 2011
[108] "Useful" is broadly defined here to mean anything from economic value to delight.
[109] Dorst 2015: 45
[110] ibid: 49

130.     A discussion about desired outcome is largely the same as 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 a 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 the British colonists created a vision for a future where government was for the people 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.

131.     The next step is to determine solutions (the "what" in Dorst's equation) that can intervene in an extant system and inflect it toward the desired future. In the ideal case, a group of solutions (remember that there is no optimum solution to wicked problems) should form a portfolio that is more than 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.

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

133.     Today prototyping (experimenting) is generally a well understood concept in the product design and technology worlds. Increasingly prototyping approaches are being used in the public sector[111] and innovation labs in higher education[112] and 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 see 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.

134.     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.[113]

135.     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 center design, barriers (or lack thereof) between citizens and front line workers. Interactions can also be prototyped through role playing to test length, content, tone, usefulness, etc. of customer engagements. This helps bring the citizen closer to the

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[111] See Nesta's report *Prototyping Public Services* for an in-depth analysis of the topic.
[112] For instance, the Stanford D School
[113] Nesta 2011, 6.

process and ensure that public services are meaningful to them as opposed to most efficient for the administration.

136.     The value of a prototyping process is typically worth additional costs as it ultimately reduces the final risk of failure. In the context of systems change, prototyping serves another function which is to help uncover greater insight about the nature of the problem itself and to help build trust 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.[114]

137.     Keep in mind that prototyping can be done 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 it is execution is imperfect. A "hacker's" ethos can help drive work forward, even when institutions prove too rigid.

138.     On a practical note, it is important to document evidence when prototyping. Not only does this make feedback loops more useful, it also provides evidence to current and future stakeholders about the value of an initiative. Evidence generated from prototypes can be used to gauge risks associated with scaling up or investing in further refinement, such as when deciding whether or not to begin a pilot phase.

*Stewarding*

139.     Helsinki Design Lab described 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."[115] Stewardship is what happens after an implementation phase begins. It is not *execution* nor is it *neutral*.[116] It differs from many traditional project management techniques in that it opens up the opportunity to change directions, both tactical and strategic, once work has begun and new information about the system or problem is 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 of the intervention in order to achieve impact. The best public service designers work to minimize the negative or unexpected system reaction employing techniques such as human centered design and co-creation to ensure that the system will at least 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.

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

141.     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 formed 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

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[114] Ibid, 15-16.
[115] Boyer, Cook & Steinberg 2013, 7.
[116] Ibid, 15.

predetermined. There is no "theory of change" before the project begins. The theory follows on developing an understanding of the problem and the system(s) in which the problem is situated. Therefore, resourcing will need 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 foreclosed upon. When working opportunistically, it is of course important to pay careful attention to scope creep through active vigilance. This need not be a heavy reporting regime, but only a regular check in to ensure work is developing according to expectations. Architecture offices have a tradition of having each project team present their work at the end of each week to the whole office. Not only does this allow the principles an opportunity to show leadership and ensure a 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 to ensure the practice is advanced despite a context defined by mostly unique transactions.

142.     Second, authority must be distributed differently. In a typical command and control or analyze-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 requires the authority to continue to make decisions as the project develops. In other words, authority is distributed through all project phases, rather than front-loaded. This is because (as explored above), the problem cannot be fully understood before an intervention begins. 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 with what resources.

143.     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 would suggest. It is much easier and acceptable to begin and complete a program on time and on budget, even if the program does not actually improve the situation. But systems change takes time and is unpredictable, and processes must accommodate long time frames and the ability to adjust to meet new demands. Stewardship is the practice of managing this unpredictability.

144.     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 organizational 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 present in a steward's toolkit make meaningful collaboration possible.

145.     One example of a stewardship in practice (among others) is explored in the book *Legible Practises*[117] in the context of the UK's Government Digital Services (GDS) program. 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* before they are considered complete. For instance, Google's Gmail email platform was famously in beta for more than five years after it had more than 100 million users.[118] In the public sector, the idea is similar: "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."[119] GOV.UK, was launched by GDS in beta in order to create interest, buy-in and feedback from the public. By attaching

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[117]     http://helsinkidesignlab.org/legiblepractises/. More from Laura Bunt at Nesta can be found here: http://www.nesta.org.uk/blog/designing-beta-public-service-finding-courage-be-imperfect

[118] www.slate.com/articles/news_and_politics/recycled/2009/07/why_did_it_take_google_so_long_to_take_gmail_out_of_beta.html

[119] Boyer, Cook & Steinberg 2013, 128.

the idea and even label "beta" to the product, it signaled to the public that GOV.UK was a work in progress and a process for improvement was built-in. In addition to the aspects of stewardship outlined above, a public beta 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."

*Evaluating*

146.      Experience suggests that evaluating systems transformation efforts can be a fraught exercise. Systems change over long timescale. They change in unpredictable ways. In the course of all 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 value of trying to measure what may not actually be measureable.

147.      This is not to say that developing an evidence base is not important. Evidence is critical to so 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 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."

148.      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 that distributes 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, analyzing and eventually sense-making.

149.      Also, given that evidence might be unstructured, originate from non-traditional sources, or is gathered via opportunistic means, analysis tools will need to be made adaptable. They will 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 need 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[120]) transition toward better use of second and third order evidence.

150.      Our 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.

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[120] E.g. systems biology, systems medicine, phenotypes, Bayesian studies (such as clinical trials).

**SYSTEM APPROACHES IN PRACTICE: CASE STUDIES**

151.    The following cases of systems change were developed in accordance to the case study protocol in Annex 3. In the case selection process fifteen different initiatives across the world were examined and four case studies were selected for in-depth analysis. In selecting the exploratory case studies, the highest form of variety (both in terms of methodological tools and government levels involved) was preferred. For some of the cases, systems and design approaches were not explicitly employed (such as the Iceland case) and yet the processes used and outcomes were systemic in nature. In other cases (such as Canada), systems thinking and design methods were formally adopted.

**Systems approach to tackle domestic violence - Case Study of the United Against Domestic Violence program (Iceland)**

*Summary*

152.    The Icelandic government is implementing a program to address violence against women which introduces a new integrated support system to victims based on a notion of domestic violence as a social (and not private) harm that affects everyone. The program was prompted by an early pilot in the southern region of Suðurnes (Sudurnes). Stemming from research findings on domestic violence and enabled by new legislation – the program sets out a radical system change - from one organized around providers and authorities (lawyers, police, social services, etc.) to one organized around the victim and focused on stabilizing the family. Today the police, social and child protective services (and increasingly schools and healthcare providers) are working in a coordinated fashion to detect and respond effectively to domestic violence across Iceland.

*Context*

153.    The region of Suðurnes is located on Iceland's south western edge and is home to the nation's second largest settlement (approx. 22,000 in 2015) and the Keflavík International Airport. Until 2006, it hosted U.S. Naval Air Station Keflavík established in WWII to protect the allies' Atlantic interests. The Air Station was the region's largest employer of approximately 900 Icelanders who provided material and support services to the base and the Iceland Defense Force stationed there. When the base was closed with little warning, it sent shockwaves through community, contributing to the highest unemployment rate in Iceland; a problem that would be further exacerbated by the financial crisis of 2008.

154.    In the wake of the station closure and financial crisis, Suðurnes–which has nearly twice the national rate of immigrants and many young parents–was experiencing compounding social difficulties. Unemployment rates were high, the number of families receiving financial benefits was also high and there were more cases of domestic violence compared to other parts of the country. Research conducted for the Ministry of Welfare in response to a 2006 government action plan to combat domestic violence showed that the highest prevalence of violence was in Suðurnes, while the rate was consistently lower across the rest of Iceland.

155.    It has long been held that the most significant driver of violence against women is gender inequality (Kyvsgaard and Snare, 2007) while lifestyle factors such as income, work, etc. play a lesser role. If this theory is true, then Iceland should enjoy the lowest rate of domestic violence in Europe. In 2010, the World Economic Forum published a study showing gender equality to be greatest in Iceland, even though the government's 2008 research showed violence to be on par with other similarly developed nations. Thus, from a classical public health perspective, Suðurnes was also a standout: prevalence of violence should be more or less consistent with the country as a whole. While current research suggests that lifestyle

factors to play a more significant role, the government's research drew significant national attention to the region along with pressure for improvement.

156.     The Icelandic government's 2006 plan to address domestic violence surfaced a new moral imperative of zero tolerance for the country in order to shift public discourse. But there were also long-term, direct and indirect costs to society resulting from domestic violence that needed to be addressed. A 2014 study by the Council of Europe (COE)[121] showed alarming realities in the domain of domestic violence, as well as significant costs arising from lack of violence prevention. Overall, the study found that while awareness, policy and legislation had improved efforts to curb violence, significant gaps remained between prevalence rates and conviction rates. This enforcement gap was found also in Iceland. Suðurnes Police analysis showed that while 18 cases of domestic violence had been brought to the police in 2011, 17 investigations were discontinued by the police (mostly due to retracted statements by the victims) and the remaining case was determined unlikely to succeed in court and dropped by prosecutors. These case numbers are low, but in the minds of police and prosecutors, they were worrying. Of the cases of homicide in Iceland since 2003, 40% were thought to be the result of violence in intimate relationships. The Suðurnes data suggested that the current system would not produce any result in terms of limiting the escalation of violence (e.g. preventing homicides)  stemming from domestic violence detection or prosecution because cases were not bringing perpetrators to justice. In a small country, the risk felt very imminent because, at some point, one of the dropped cases could eventually escalate into a homicide, according to current and former Suðurnes authorities. The gap between prevalence (prevasiveness of offence) and prosecution indicted the current system. Detection, interdiction, support, treatment and criminal justice were present as services, but not aligned toward common means and ends.

157.     Domestic violence also places a significant economic burden on society. According to the Council of Europe report, while it is difficult to measure the total "costs" of violence against women, cost categories include:

> ...increased burdens on law enforcement structures, costs linked to the judiciary (civil, criminal and administrative), legal costs incurred by an individual party, health care costs, housing and shelters, lost wages and/or decrease in taxes paid to the state due to reduced employment and productivity, social services for women and their children, income support and other support services. (1)

158.     Extensive as this list is, it doesn't include long term costs, especially to children, who when exposed to violence in the home tend to repeat the behavior later in life creating a vicious cycle. As one senior official pointed out, the toxic stress experienced by children exposed to violence in the home can mirror similar negative effects of children raised in war zones.

159.     Costs for an event (or series of events) such as domestic violence are notoriously difficult to calculate. Some national studies have nevertheless been conducted and aggregated by the COE. What is clear from the studies is that the effects of violence are complex and vary widely based on how the research was structured and the kinds of services available to victims. One study from Finland estimated the cost to be 101M EUR in 1998, or about 20 EUR per capita. An EU25 study estimated domestic violence costs to be 16B EUR in 2006, or 35 EUR per capita of the 25 member states. In the US, it's estimated that domestic violence costs 8.3B USD annually in direct costs and lost productivity.[122] In Iceland, understanding costs was an important element in raising awareness and motivating action. But in a small country, "the lines of communication are very short" and the toll of violence can be harder to ignore.

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[121] https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=090000168059aa22
[122] http://www.caepv.org/getinfo/facts_stats.php?factsec=2

160.    Until the authorities in Suðurnes began to recognize that they had a problem in 2010, domestic violence was managed through various administrative silos. In emergent situations, the police responded to a call from a victim or relative to ensure public safety and stop any ongoing violence, but would generally not treat the home as a crime scene and conduct an investigation (this could explain in part why few cases ended in conviction much less a formal charge). Social services may become involved in an active interdiction, but typically they followed up with support services once the acute phase had already passed. Child protective services would be called if a child was present and he or she was obviously impacted by the event. However, the three arms of services were not coordinated through a response or action protocol. It was largely left to the police to determine what was necessary and when. In most cases, victims would not make additional requests beyond the initial intervention.

161.    In the context of the laws prior to 2011, this arrangement was natural. The key concern from the authorities' perspective for domestic violence cases other than public safety, was the location; specifically that the location be a domicile–violence was not thought of in relational terms, but in locational terms. For instance, a case of assault between two people in an intimate relationship would be treated differently (classified as assault, not domestic violence) if it occurred in a restaurant versus the home. Domestic violence was also not recognized as an offence in the Icelandic penal code, but as a component of several other kinds of violations (assault, sex crimes, etc.) if there was an intimate relationship between the victim and the accused. This registration structure limited the police's ability to track prevalence and conviction rates and created inconsistencies in how cases were handled. Withdrawal of claims was common and even those that were pursued often had incomplete information, all of which contributed to a particularly damaging situation where repeat offenders were unlikely to be convicted. At a more abstract level, it reinforced the compartmentalization of domestic violence as a private matter that did not rise to the level of other forms of violence or necessitate development of a coordinated, preventative response.

162.    However, following the government's 2006 domestic violence action plan, a new law (No. 85/2011) was approved in 2011 with the aim of providing authorities more tools to protect victims. It was based on an Austrian precedent that permitted authorities to remove offenders from the home and place a specific restraining order on them when domestic violence is suspected. Previously, the onus of requesting a restraining order or removing a violent individual from the home was on the victim, who would rarely demand either intervention. Furthermore, when a restraining order was requested, the administrative process could take up to a week and was determined at the discretion of the regional chief of police and finally by a judge. These factors could bias the outcome of an intervention toward the concerns of law enforcement and the judicial system rather than addressing the complex, emergent needs of a victim or mitigate broader social harms.

163.    It is important in the context of this case study on a very sensitive subject to recognize that while Iceland's pre-2011 system of detecting and responding to domestic violence provides limited support to victims, it would have seemed natural, normal and to many, sufficient at the time. It was not designed this way because of a lack of sympathy or concern for victims. In fact, it was never designed. The system evolved over time in response to social norms, advocacy (or lack thereof), budgeting decisions and other dynamics into a structure where domestic violence was not considered sufficiently serious and the victim was solely responsible for pushing the matter forward.

### Initiating a Process of Systems Change

164.    In the wake of the 2011 law providing authorities with more provisions to protect victims, the Suðurnes police initiated a special investigation to determine how the police were responding to the highest prevalence of domestic violence in Iceland. The findings were disconcerting:

- Few domestic violence cases successfully pass through the justice system because few investigations were completed and few convictions were realized.

- The police rarely used restraining orders or expelled perpetrators from homes.

- There were few supports available to victims or perpetrators.

- Little cooperation between police, social services and child protective services.[123]

165. For the police, the facts suggested that they were "not doing their job properly" and dramatic, systemic change was needed. Following such a determination, the next steps often seem unclear or impossible. But in a small district like Suðurnes, teamwork was a normal practice which made collaborating on an issue at a systemic, cross-silo level with key stakeholders relatively straightforward. The police began by arranging a meeting with representatives from the health and social services as well as the church to discuss what could be done. After a few additional meetings, it was decided to launch a one year pilot project called *Keeping a Window Open* that would bring the police and social services into closer cooperation. The title of the project referred to the window of opportunity open in the immediate aftermath of domestic violence when an intervention can achieve its greatest impact. Rather than abiding by an administrative timeline, the police and social services would do as much as possible while the window was open. This approach would represent a significant departure from the common, transactional practice of simply removing a perpetrator from a scene.

166. The pilot project's underpinning rationale was that victims' needs could be better met through a coordinated, rapid intervention that would effectively provide "wraparound" services. This intervention would be designed to yield stronger evidence that improved the likelihood of a future conviction. Ultimately, it would shift the design and delivery of the domestic violence "system" from an institutional architecture to a human-centered architecture. While this systems language was not used by the Suðurnes Police and their partners at the time, systems concepts were nevertheless embedded in their project.

167. A systems approach was achieved by developing a specific set of aims that responded to the failures identified in the government's research and the police's special investigation married to a set of organizing principles such as zero tolerance, social harm, the right to freedom from violence, gender equality, etc. The institutional boundaries that would normally govern the structure of public policy or even experimental pilot projects were minimized; not as an explicit attempt at de-siloization, but more as a matter of local practice in a small network of actors.

168. However, an organizing theme of the Suðurnes pilot was clearly systemic: "the whole system needed to take domestic violence much more seriously" from the first indication of a problem. Other aims such as preventing repeat offenders and increased prosecution rates would also accrue systemic benefits. The tools employed in the pilot would include:

- Thorough crime scene investigation

- Recording testimony on scene

- Medical examination by doctor

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[123] "To Keep the Window Open" presentation, Suðurnes Police

- Social services referral

- Using legal provisions of restraining orders and home expulsions

- Provision of support to victims

- Follow-up visit to the home within one week

- Panic button to alert police

169.    In practice this meant that rather than one to two officers arriving on scene, a consortium of 7-8 people would intervene including four uniformed officers, a detective, social services, child protective services, etc. Lawyers and additional service providers would be on call 24 hours a day. Once an incidence of domestic violence was detected, the police would contact social services immediately to begin the process.

170.    At its core, the pilot would require deep cooperation between police and social services; however, current regulations imposed some limitations. A social worker is automatically called to the scene in every case where children are listed in the home or present at home. But in cases where children are not involved, police were required to receive at least verbal consent from the victims to call a social worker. In most cases (about 90%), the victims were in such need of assistance by the time they call police, they are relieved to get a social worker on scene and therefore provide consent immediately. Experience had shown cooperation with the victim improves when social workers are involved from the beginning and that victims were more likely to go to a doctor for medical examination under the escort of a social worker. Under these conditions, the victim would receive better support and critical evidence was more likely to be obtained by the authorities in order to make a successful prosecution.

171.    After much planning, the *Keeping a Window Open* pilot was launched on 01 February 2013. At that time, Sigríður Björk Guðjónsdóttir was the Chief of Police, Skúli Jónsson was Deputy Chief of Police and lawyer Alda Hrönn was head of the legal department of Suðurnes Police. Chief Guðjónsdóttir and Deputy Chief Jónsson (uniform police), together with Hrönn and investigative police formed the "Three Amigos" who were charged with pushing the process forward. This steering function included new protocol training, shifting the mindset of police toward the *social harm* concept, public awareness and process refinement.

172.    The mental models that arise from training, routine and group norms are one of the most stable elements of complex social systems. Suðurnes police were no exception due not to some form of institutionalized malevolence, but because of habit. As one observer shared:

> The Deputy Chief was really great: a male voice following up with the work [of the pilot]. If there was resistance from policemen then he spoke to everyone one-on-one asking, 'Why are you complaining? We are changing, why are you not changing?'

173.    As this quote suggests, gender–a critical component of authority (witness the topic of this case study)–played a role in shifting the group norms of the predominantly male police department. Chief Guðjónsdóttir had been in the department since 2007 and was the first female chiefs of police in Iceland; a challenging position in the best of circumstances. The Three Amigos leadership structure together with the Deputy Chief's hands-on approach must be noted as part of the strategy to shift norms within the department. But effective leadership at the top that backed the project and the people was critical:

> Sigríður, as the Chief of Police in the District, had a big role in the project. She pushed us forward and as you know if you do not have support from your boss, you are not likely to succeed.

174. An important aspect of shifting from a siloed to a human-centric service delivery model was to develop means by which the new consortium would increase the surface area of contact between support services and victims. Victims and their circumstances and contexts are highly varied which presents a challenge to public sector institutions which have long understood their citizens in single dimensions defined by administrative authority. At a pragmatic level in Suðurnes, this required extending engagement with victims beyond the acute crisis to better understand the situation and calibrate needs to available services.

175. Within one week of an incidence of domestic violence, a Suðurnes police detective and social worker would perform a follow-up visit with the aim of understanding how the situation had progressed and if violence had continued. Following the visit, a report would be prepared that would help police assess if there was ongoing violence; prohibited entry or a non-answer was often a good indicator of an ongoing problem. In this first week, social workers would also visit the perpetrator to offer assistance such as referral to state-subsidized counseling. Outcomes from these visits would be carefully recorded to develop data that would help the consortium better understand the nature of domestic violence, how services provided relief, providence evidence for future trials, and how the pilot itself was performing. The Suðurnes Police also developed a set of risk factors that would help them anticipate if a case might continue to be a problem. These included analysis of the probability for escalating violence, repeated offenses, and need for a restraining order or expulsion from the home.

176. While the pilot consortium worked on changing mindsets about domestic violence internally, they also needed to raise awareness among the public in the region. Following the launch of the pilot, they published a brochure entitled *Is Domestic Violence a Part of Your Life?* in three languages. Recognizing the police's limited intelligence about where domestic violence was occurring, they distributed copies to all the households in the Suðurnes region with the support of the Ministry of Welfare. Social workers also began working with teachers and staff in schools to recognize some of the indicators of domestic violence and what they can do if children share pertinent information. The consortium also launched a public information campaign in the press and lectures to socialize and strengthen the concept of domestic violence as a social harm.

177. For Suðurnes Police general counsel Alda Hrönn, the law was another critical medium in which to pursue transformative change. Her guiding principle was that the law be suitable for the needs of the victim, not tailored to the *needs* of the system. In her view, the law was not immutable, but the human rights of domestic violence victims were. This provided an orientation to existing statutes and decisions made by the courts with which she could assess how well existing laws were aligned with the concept of social harm. Having represented victims of domestic violence, she found very little gray area in terms of her clients' well-being. For Alda, the purpose of the law was crystal clear: protect women and children who are predominantly the victims of violence.

178. By testing the limits of the law and working to reorganize it around the interests of victims, the work of the Suðurnes pilot could be made more durable and transferable to other regions. Alda and her colleagues understood that by creating legal precedent, it notches progress in the legal and broader systems.

179. A final critical layer of initiating a new process in Suðurnes was to build a mechanism by which the consortium could learn by doing. Every two weeks the uniform and investigative police, social services and health services would meet to share information, refine practices and strengthen the social and working

relationship of the consortium. In practice this meant reviewing the current case load, considering available remedies when a victim is believed to still be in danger, discussing shortcomings in cooperative practices and determining how to respond as a group to new procedures and directives from the National Commissioner of the Police. Like Morbidity and Mortality conferences (M&Ms) in academic hospitals, the consortium's biweekly meetings bring separate administrative silos (medical specialties in the case of hospitals and public service departments in Suðurnes) together as peers with a shared objective of improving practices and developing greater understanding and alignment. This was particularly important in helping the consortium detect and work to resolve systems issues such as gaps in services or legacy policies that are no longer relevant.

180.    Meetings such as M&Ms consume time and resources and can seem unnecessary especially to functional areas whose tasks and administrative authority are well defined. It can be further tempting to dispense with these meetings once a development phase is largely over. However, when working in complex emergent systems, they are critical to maintaining relevance, flexibility and efficacy of an intervention such as the Suðurnes pilot. From a planning perspective, time and space must be made to do the work of systems change such as social learning processes like M&Ms. As one member of the consortium shared, "To do this kind of change, you need to have the people who have the time to do the work right. No one can do it alone."

*Impacts and Systems Effects*

181.    The impact of the Keeping a Window Open pilot can easily be seen in the case statistics assembled by the Suðurnes Police. Between 2010 and September 2015 (the date of last available statistics – figure 10), more cases have gone to the police and more cases are making it into the courts.

**Figure 10. Domestic Violence Cases Suðurnes, 2010-2015**
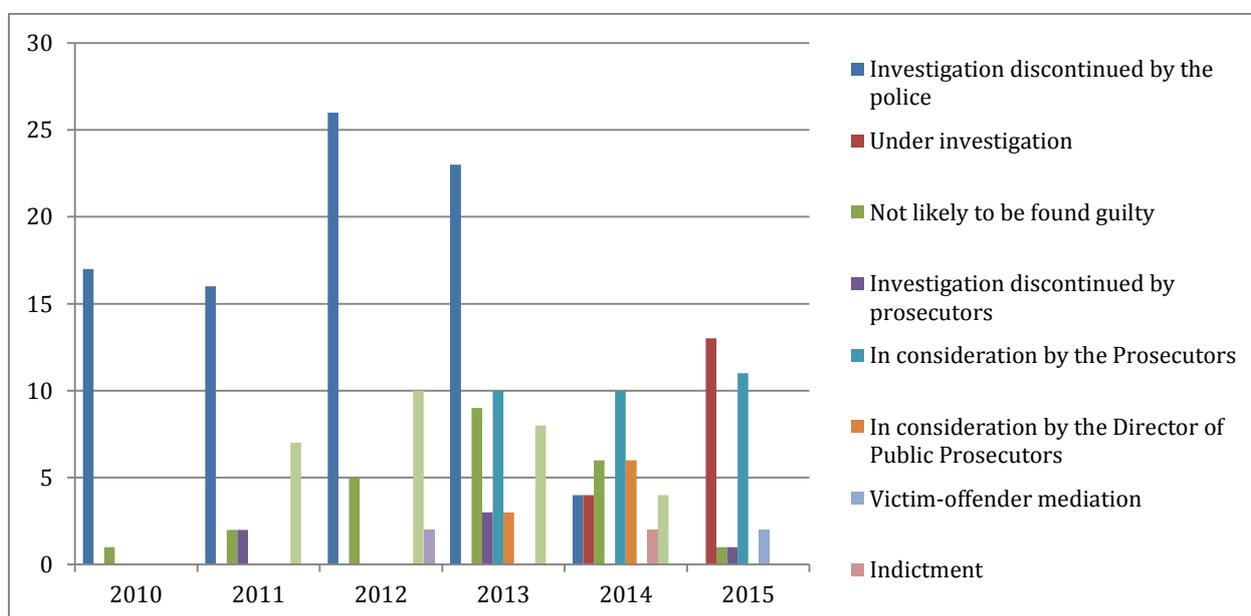


Source: Jónsson and Einarsdóttir 2016.

182.    A higher caseload suggests that public awareness about domestic violence is possibly increasing as economic and other social factors remained relatively stable in the region. Better registration of cases also explains in part the increase in cases seen in 2012. More cases making it to the courts and resulting in

prosecution suggests that better evidence is being generated and possibly that the legal system is changing vis-à-vis domestic violence. Further analysis will be needed to determine correlation/causation, but what is clear is that the system has become more responsive to domestic violence. Remarkably this impact was achieved with no additional budget used toward the pilot. The existing budget was reprioritized to cover additional activities and costs.

183.    Following the successful one-year pilot in Suðurnes, new national procedures were issued by the National Commissioner of Police in December 2014 based on Keeping a Window Open. Since that time, all police districts across Iceland have adopted a similar approach with local variations based on municipal infrastructure, size of the population, etc. Meanwhile in Suðurnes, practices, knowledge and partnerships continue to be refined. With 10 years of data, the authorities hope to have a clear picture of what worked in the project and what remains to be done. In the meantime, they are working to strengthen information sharing by working closely with health services and schools. Privacy protections remain a key systemic barrier to greater fluidity and transmission of data between hospitals, schools and the original partners of the consortium.

184.    Suðurnes Police Chief Guðjónsdóttir has since been appointed Chief of Reykjavik Metropolitan Police, the largest municipality in Iceland and continues her work on domestic violence there with Alda Hrönn as Chief Attorney for the police. The City of Reykjavik also established a steering committee for domestic violence housed in the city's Office of Human Rights. They are tasked broadly with carrying forward the work of raising the once private issue into a public issue with the support of political leadership. The Office of Human Rights provides a neutral territory that helps the committee navigate complex administrative silos in the city. Challenges continue to arise due in part to a dynamic context (i.e. changing demographics) and also because of greater clarity into the complexity of domestic violence and how institutions respond, both of which couldn't easily be foreseen.

185.    For instance, before the project, Reykjavik police called child protective services in only about 3% of cases. Now, they are called in nearly every case which is partially a result of demographic changes, but has nevertheless led to an explosion of caseload for the authorities. This increases the risk of burnout and declining job satisfaction and will likely require more resources deployed by the city and state.

186.    In 2016, a new approach was launched in Reykjavik to provide a "one stop shop" for victims of domestic violence called Birch House. Birch House brings together all of the City's social services and emergency housing into one place in order to provide true wraparound support for victims and their families. This new project represents a dissolution of administrative silos (from the perspective of the "user") into a single service platform. It is a significant advancement of the concepts initiated by the Suðurnes consortium. While this approach may not be viable in other, less populated areas, Birch House signals an entirely different approach to domestic violence and speaks to the promise of moving systems toward human centricity. As one observer noted, "We have seen a big difference in culture and priorities within the system."

187.    Also in 2016, the Institute for Gender, Equality and Difference at the University of Iceland conducted a study of the project to better determine its effect on survivors, police, social services, child protective services and perpetrators. This kind of project is inherently difficult to evaluate because it involves a complex intervention into a complex community and will entail multiple sources of both qualitative and quantitative data. Nevertheless, the evaluators set out to better understand if the system was better serving victims and perpetrators, if authorities were collaborating more effectively, if children were better equipped to live with violence, and whether public discussion had changed with respect to domestic violence. Overall, victims were satisfied with the performance of police and social workers. Most police officers were also satisfied with the program and thought it was well designed to meet the needs of victims.

Social services had a very positive view of the project with 93.5% of respondents believing it was good for survivors.

**Figure 11. Together Against Domestic Violence Evaluation**

188.     Critically, social services and police both felt that collaboration was working and improving with each case (see Figure 11 above). However, there are challenges too. Police and social services feel that there is much more workload which risks burnout; resourcing needs to be reevaluated. Also, the crucial follow-up visit needs to be redesigned to be more effective.

189.     Work continues in Iceland to combat domestic violence at a systemic level. In 2015, the number of cases of domestic violence dropped dramatically in Reykjavik from 799 in 2014 cases to 607. While it's not clear what are the causing factors determining this drop, the effect of systemic changes in approaching domestic violence continues to be monitored with a view of providing a better assessment of the contribution of system change in preventing domestic violence and providing effective support to victims.

**Using system approaches in policy design – Case study of the Experimental Policy Design in Finland**

*Summary*

190.     In 2015, Finland started to develop a new framework for experimental policy design. Together with Demos Helsinki, a Nordic ThinkThank, the Prime Minister's Office (PMO) of Finland employed a combined systems and design thinking approach to develop a new policy framework to carry out experiments in government. As a result, experimentation was included into the strategic Government Program ('Finland, a land of Solutions') in May 2015 and an experimental policy design program was set up. The new approach to policy design allowed both broader "strategic experiments" (formalize policy trials) – for example, the ongoing basic income experiment – and grassroots experiment designed to build up the "experimental culture" in the public sector in Finland. There are by now over 20 experiments in process by the central government and many more conducted on the municipal level. In 2017, the Finnish government is launching a digital platform called *Kokeilun Paikka*[124] (Place to Experiment) to support the government's key goal: find innovative ways to develop public services.

*Context*

191.     For some time, Finland has been engaged with the debate on systems change in government as part of the Governments for the Future (2012-2014) project. The project was launched by the Ministry of Finance and the Prime Minister's Office partnering with SITRA (fund for innovation operating directly under the Finnish Parliament) to find new insights for executing significant state administration reforms.

192.     In 2012 the Committee of the Future in the Parliament was holding hearings about new methods of steering and strategy for the country. One participant described: "There was a general feeling in the parliament that they (Parliamentarians – editor) were far removed from what was going on – there were a lot of discussions, but very little action." One of the topics presented at the committee was on "experimental culture", based on sustainability and environmental experiments, which received a lot of interest across party lines. The committee commissioned a special report, "Kokeilunpaikka" (Place of Experimentation)[125] which was published in 2013 arguing for rapid iteration, grassroots experiments and strategic outlook of government in experimentation. Furthermore, the report suggested the creation of an office or ombudsman for experimentation and public sector innovation. Juha Sipilä, who in 2015 became the Prime Minister of Finland, was then a parliamentarian and heavily involved in the work as a member of the committee. Initial political buy-in for experimentation in government was created; it was especially fortuitous that the future Prime Minister was directly involved in the work: "I don't know if the approach would have been promoted at the PMO's level at such a pace if they (Prime Minister's party, Central Party – editor) wouldn't have made it their theme to promote." In the meantime, as the idea took root, several other reports on experimentation in public policy were completed in Finland.[126]

193.     In parallel, the government started the OHRA project (In Finnish: Valtion ohjausjärjestelmän kehittämishanke)[127] – the project to reform the government's steering framework – to prepare recommendations for the next parliamentary term after spring elections of 2015 to improve the impact and effectiveness of government actions.. The OHRA activities identified the horizontal nature of many new

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[124] See http://www.kokeilunpaikka.fi/.

[125] Berg 2013.

[126] For example, Berg, A. (2014) Kohti Kokeilunkultuuria. http://www.sitra.fi/julkaisut/Selvityksi%C3%A4-sarja/Selvityksia77.pdf; Työ- ja elinkeinoministeriö (2015) Kokeileva kehittäminen.

[127] Report of the OHRA Project group (2014) http://valtioneuvosto.fi/documents/10184/1190126/OHRA-raportti-en.pdf/79db9e53-6929-475b-90fa-87fb7aae508f

policy problems, lacking 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: "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 deemed necessary. Furthermore, the OHRA project recommended that the Government Program should become more strategic. The final report proposed that a major part of the research funding supporting government decision-making (so-called TEAS function) should be allocated to the needs of the Government Action Plan. This became later the funding source for experiments in government.[128] At the end of the process, there was a high level of consensus regarding how the policy making process should be developed in Finland.

194. This was the context in which the PMO started to look for new tools to improve the government's steering framework. The Office was especially interested in the upcoming fields of behavioral insights, experimentation and evidence-based policy making. Thus, the office drafted a tender concentrating on how to implement the aforementioned. This merged two different theoretical sources for the experimental policy design program: on the one hand, behavioral economics based thinking (randomized control trials (RCTs), BIT experience from the UK); on the other, rapid process of experimentation/iteration – lean start-up thinking – coming from business experience. This meant that from the get-go the whole program had two different ideas built into it: top-down (RCTs etc.) and bottom-up thinking (iterative, grassroots level development work). This later on resulted in the division of experiments in the PMO: large policy trials (formalized RCTs) were separated from smaller, bottom-up and intuitive ways of doing experiments.

195. Demos Helsinki – a Nordic Thinktank[129] – focused its proposal on strategic change, won the tender and started working on the framework early 2015. They proposed a practical approach to the framework, shying away from theoretical approaches – "traditional literature review" –, with the ultimate purpose to offer useful insight which could feed into an agenda for the government in this space.

*Initiating a process of systems change*

196. As outlined above, Demos Helsinki started their work in early 2015 with a brief of complex topics – behavioral insights, evidence-based policy making, and experimentation – from the PMO. No single framework existed that took into account all of the aforementioned. It was unclear what the concrete demand from the government was. Nevertheless, Demos Helsinki saw a possibility under the initial auspice of behavioral insights to create an opening for feedback mechanisms 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 ways of policy design and concentrate on the "iterative nature of policy making."

197. As Demos Helsinki's work was not particularly centered on behavioral insights, they wanted to consider all methods, tools, resources (co-creation etc.) to steer behavior and create a "new way of policy making" for a more resilient society. The idea was to create a "Nordic model" (even if not specifically calling it that) – giving the power to the citizens – and after some work a "Finnish model" emerged.

198. Struggling with the initial pre-defined agenda, the project had to be reframed. Behavioral insights were seen as too complex and general; it did not allow Demos Helsinki to focus. Hence, a strategic choice on experimentation was made. However, the team tried to keep a broader view – "not to love the method

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[128] Ibid.

[129] http://www.demoshelsinki.fi/en/demos-helsinki/

too much." Furthermore, experiments were seen as "more understandable" to the general public as pilots, citizen engagement, which was especially important at the time, because Finland was approaching general elections. Thus, while the project was initiated with a strong emphasis on behavioral insights and evidence-based policy design, it culminated with a framework of experimental policy design.

199.    To reach a framework that a public sector could apply, Demos Helsinki adopted a multi-method approach, first carrying out an initial review of relevant practices, then interviewing experts from the public, private and the third sector, creating a community around experimentation and then getting international validation for the report. Demos Helsinki applied a loose systems design approach to analyze the problem and pull together different sources and design the process for experimentation.

200.    The team first carried out a review of relevant literature in the field benchmarking existing OECD, Nesta, SITRA documents.[130] "We didn't want to come up with something new, just take the findings into the Finnish context."  After analyzing the working methods of top benchmark innovation organization in the public sector – Mindlab, BIT, Kennisland, What Works Center for Aging Better, Policy Lab UK etc. –, the team arrived at the conclusion that the feedback loop of most of these was fragmented: final feedback from the implementation process did not reach the policy design process, there was a gap in the process. "There is no self-evident link in social, health services between implementation and policy design" – going from "How" to "Why" (see Figure 12 below from the OHRA project). Experimentation was seen as a way to build the link between citizens, end-users, stakeholders and policy designers.

**Figure 12. Policy Making Cycle**
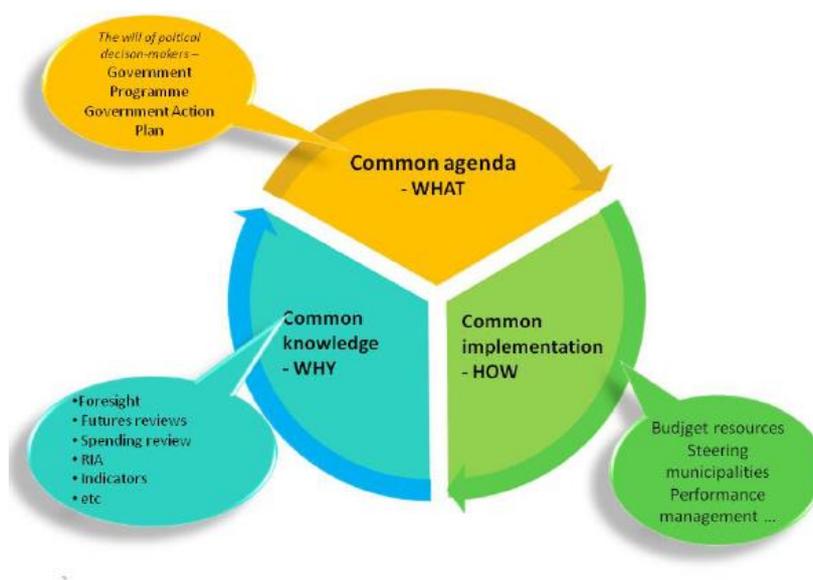


Source: Report of the OHRA Project group 2014.

201.    Demos Hesinki proceeded to put the different methodologies together and develop a "human-centered model of experimentation". The aim was to make steering mechanisms more effective by using

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[130] E.g., UK Cabinet Office 2011 "Open Public Services White Paper"; NESTA, UK Cabinet Office 2012 "Innovation in policy: allowing for creativity, social complexity and uncertainty in public governance"; European Commission 2013 "Powering European Public Sector Reform: towards a new architecture"; SITRA 2014 "Government for the future: building the strategic and agile state"; Valtiovarainministeriö 2014 "OHRA: Päätoksistä muutoksiin".

behavior-based knowledge and develop those mechanisms in collaboration with citizens. See the process outline in Figure 13 below. 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 propose novelty to the process of experimentation, but the report itself puts the process in the Finnish context. Furthermore, the model assumes a strong presence of an "experiment facilitator."

**Figure 13. The Experimental Policy Design Model**
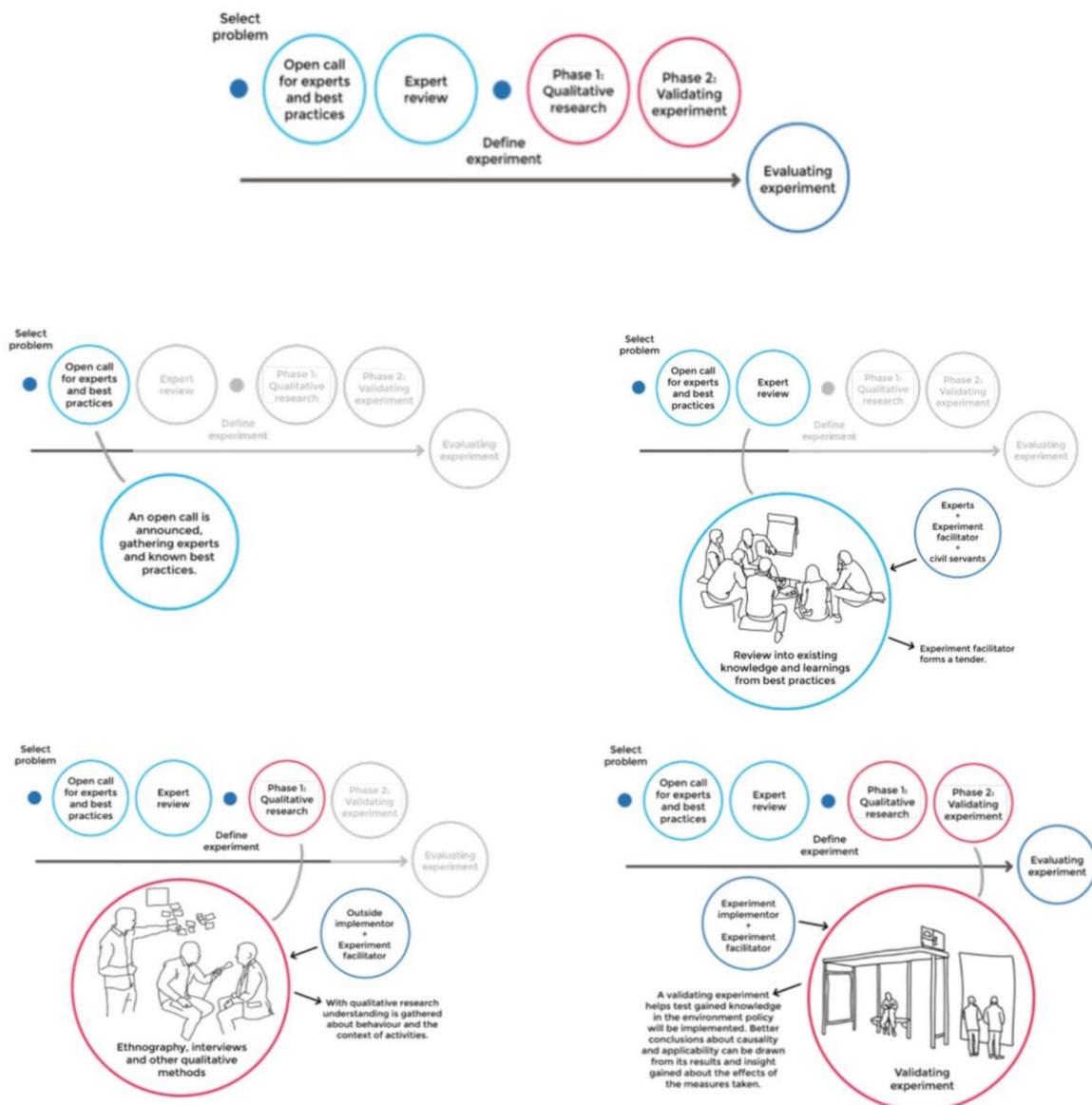


Source: Annala 2016.

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202.     In the early version of the report, Demos Helsinki used the traditional design double diamond model to describe the process of experimentation in government, but it was difficult for civil servants to understand. Thus, the model was simplified to different parts of the process and a table simulating the process was created (see the evolution in Figure 14). Traditional form of representation proved to be the most effective with civil servants.

**Figure 14. Translating the Approach to Public Sector Context – from the Double Diamond to a Table-Based Simulation**
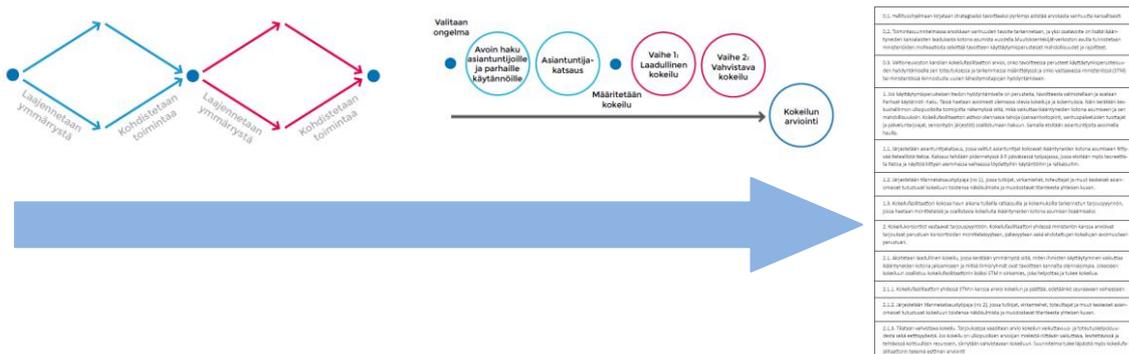


Source: Authors based on material in Demos Helsinki 2015.

203.     The first draft of the framework was "floated" with political parties in Parliament, three government parties, permanent secretaries, civil servants in workshops and wider community (NGOs) and international experts. With the former, interviews were carried out and a field trip to London in March 2015 was organized. There, the work was presented to international experts and the model validated (participants from BIT, Design Council, Cabinet Office, Design Lab, What Works, NESTA). This created a network both in Finland and outside – later christened as "the godparents of experimentation" (Kokeilukummit) – to validate the concept. This helped to create a broad-scale acceptance for the approach. As one of the people involved in the process described: "There was a fair amount of discussions and educating politicians."

204.     However, more thorough debate was cut short as the opportunity to align the framework with the new Government Program emerged. While the report came out in July 2015,[131] the results had to be presented earlier, mid-March to permanent secretaries, who started their discussions on the new program. As such, in parallel to the Demos Helsinki's work on the report, PMO's strategy unit was developing materials for the new Government Program. SITRA and Demos Helsinki were involved in the process encouraging 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.

205.     To leave room for debate, the report draft did not propose strong or too specific measures to implement the experimental policy design program. It outlined the steps of the program itself, delineated the role of experimentation facilitators (but did not indicate the need for a special unit for experimentation) and proposed a 2-year implementation period. With the broader consensus, backing from the new prime minister and the work of the PMO, the new Government Program put special attention on the Change of

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[131]   An English version of the report can be found here: http://www.demoshelsinki.fi/en/julkaisut/design-for-government-humancentric-governance-through-experiments/

Working Methods. This became one of six main blocks of activities in the Government Program merging together deregulation, digitalization and experimentation. First time in history, a truly strategic Government Program existed: "There finally is a story for the government, vision for the next 10 years and a plan of action for the 4-year term."

206.     Nevertheless, as the time schedule was pushed forward some of the ground work was not included in the program. Demos Helsinki wanted to liaise with the Aalto University's Design for Government course running at the same time, but the timelines did not match. The program took students from different fields – engineers, designers etc. – to analyze different services and systems within the public sector (thus, the students visualized public R&D transactions, outlined the architecture of agricultural subsidies and debated nudging for healthier eating in schools). The program was still used as an example in the Demos Helsinki report for insourcing ideas.

207.     While the work of Demos Helsinki was fast-tracked, they had follow-up projects and reports connected to the project (regarding funding of experiments, ethical code of conduct, etc.).[132] They "kept on hanging around the process," briefing the PMO and thus, stronger recommendations regarding the implementation of the program were debated after the report was de facto completed. With pushing the agenda forward a new legal basis for experimentation in the public sector was created; and the Prime Minister's Office set up an Experimental Finland Team in its organization which started working in 2016.[133]

208.     Experimental Finland Team in the Prime Minister's Office was created to support the implementation of strategic experiments and implement the policy of "experimental culture" in accordance with the government program. Furthermore, the program has a parliamentary advisory group to legitimize action on the highest level. As such, "a culture of experimentation" became a political goal on its own right.

**Figure 15. The top-down, bottom-up approach of experimental culture**
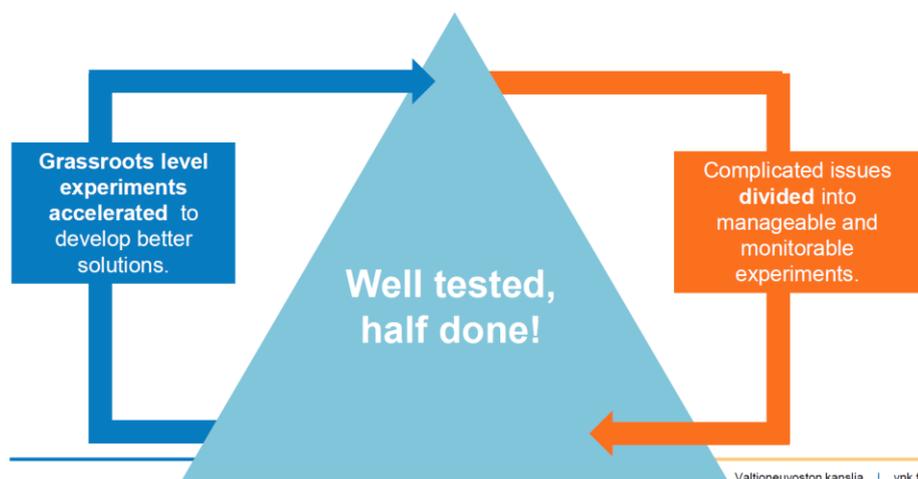


Source: Alanko 2016.


Source: Alanko 2016.

[132] Demos Helsinki 2016.

[133] Experimental Finland (2016) http://kokeilevasuomi.fi/en/frontpage

209.     As mentioned before, the program took a specific top-down, bottom-up approach (see Figure 15) due to the interest in both RCTs/behavioral economics and more start-up style government activities/transition thinking. Based on the taxonomy developed by NESTA, the Experimental Finland Team engages with three types of experiments (see Figure 16 below): 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, while it also assists pilots and encourages grassroots level experimentation.

**Figure 16. Taxonomy of Experiments**



Source: Experimental Finland (2016) http://kokeilevasuomi.fi/en/frontpage.
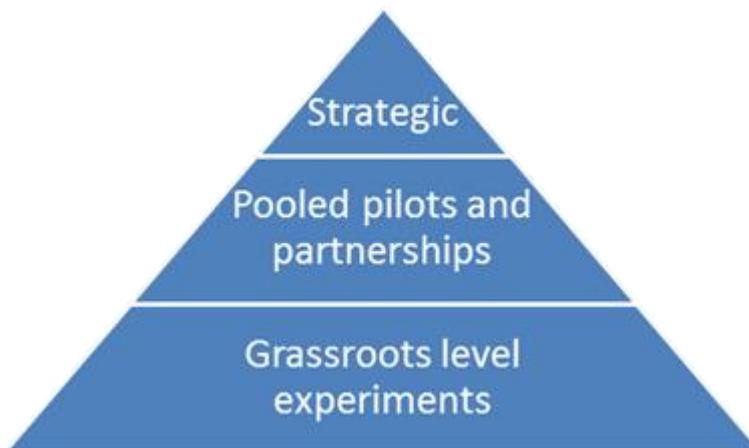
210.     The Experimental Finland Team is working with a de facto "sunset clause" – they have 2017 to carry out their activities and plant the seeds for further experimentation in government.  There has been some discussion about extending the Team's operating time, but as was put by one of the people involved: "this is very uncertain." They hope to do this through creating networks of experiment-enthusiasts in government (including "Kokeilukummit" – "godparents of experimentation") and co-operation projects with other parties, e.g. the polytechnics. This describes a top down push for experimental culture. At the same time, the team was called to develop a crowdsourcing platform for grassroots experiments (Box 7), 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 which will be run even after the Experimental Finland Team will conclude their work.

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**Box 18. A Digital Development Platform for Experimentation**

In collaboration with the non-governmental organisation Demos Helsinki and the Finnish Environment Institute, the government analysed the funding of experiments, tests and policy trials in Finland. Based on their findings, they decided to establish a new digital funding platform for piloting and experimenting public innovations. The need for a platform/digital tool comes from the fact that experimentation on the grassroots level (municipalities, schools etc.) is very common in Finland, but there is no central overview of experiments conducted. Thus, learning is coincidental and not cumulative. The digital tool should in its final version combine idea generation, challenge posting, methodologies, funding and description of experiments themselves (figure 17). Consequently, it should facilitate evidence-based policy making, create trust and a community around experiments.

**Figure 17. Main Features of the Funding Platform**



Source: Annala, M. (2016) Experimentation and Demos Helsinki. https://www.slideshare.net/secret/e9Ov4XKnvcn9i

First and foremost, the platform is designed to promote useful initiatives and new practices by supporting small trials initiated by citizens, as well as by funding large-scale policy trials by the government. The project relies on semantic web technologies: there will be an algorithm that draws in information from the web about experiments first in Finnish, but also in English. Thus, the platform enables users to obtain conclusive evidence on how initiatives work in practice and to disseminate their benefits more effectively. Consequently, the platform is both a toolbox, evidence base and a crowdfunding tool for experimentation.

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

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 the political goal was set to develop a platform by the end of the year/beginning of 2017. This meant a very short period for the Team 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); second, a validation workshop was held with selected ICT companies to see if was actually possible and the third workshop was held recently to discuss the wireframe of the platform. Forth workshop covered the financing of experiments. In parallel the Team organised a hackathon on what the platform/tool technologically should look like. While the Team took many steps to co-create the platform with the experimental community, the short time frame was a challenge. Furthermore, public procurement rules set boundaries to the Experimental Finland Team to which solutions they could adopt. After the hackathon they wanted to combine two top solutions, but the

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procurement rules did not allow it.

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. In the beginning of 2017 the platform will be testing and the final evaluation for the tool will be carried out in June 2017. The platform will be run by a private company, thus, it is independent from the continuation of the experimental policy design program and the Experimental Finland Team on the PMO's level. However, lacking the support system, it is up to question if the platform's knowledge pool will be used effectively in government and if the pooled experiments will be evaluated sufficiently to create learning effects in the public sector. Consequently, the Government of Finland must decide how best to ensure continued political support and buy-in after the remaining two years of its mandate, so as to ensure sustainability.

*Emerging practice of experimentation*

211.     One of the main questions concerning the experimental policy design program is: when to use experiments? For this the NESTA typology of experiments – as outlined above – was adopted but the Experimental Finland Team. Thus, experiments in the program can go from rapid experimentation with no extra funding and need for randomization to formal randomized control trials, with the mixed-method design experiments (pilots etc.) in between. This in practise is somewhat confusing to both researchers and practitioners.

212.     RCTs require quite a lot of methodological rigor and are thus, less understood; while more rapid grassroots experimentation is more intuitive. Due to the fast-tracked nature of the experimentation design program Demos Helsinki and Aalto University are now working on a code of conduct for experiments to account for when and how to experiment (taking into account ethical concerns) – "ideally this would have preceded the program." Nevertheless, the practise is already emerging.

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

213.     Methodologically experimentation should be seen as the way to move from uncertainty towards more calculable risks, make one decision and build next decisions onto the former. This is especially import in very complex environments. However, it is important to keep the mandate for an experiment "clean" (not directly tie it to strategies as the results can also show that a solution should not be further developed) and the scope clear. Many interventions cannot be assessed feasibly through experimentation, and in some cases, replicability is not clear.

214.     On the whole 5-6 ministries are participating in the experimental policy design program with 20-25 experiments ongoing. Furthermore, there are experiments on the municipal level (e.g., in the City of Helsinki) aiming to increase participation, strengthening community and building bridges between generations and different target groups. In addition, there are many other smaller, grassroots experiments at smaller municipalities, within polytechnics etc. The nature and scale of funding for experiments is very different: from €500 to €20,000 for grassroots experiments and pilots and minimum €50,000 for fully developed RCTs. Since the initiation, several high level policy trials have been planned. For example, digital municipal trial and local government trials have been initiated to curb expenditure and reduce obligations under the Ministry of Local Government and Public Reforms. Ministry of Education and Culture has pushed forward language trials and Ministry of Social Affairs and Health is running a service voucher system trial. Ministry of Justice and Employment will start regional trials in employment and business services. Nevertheless, the flagship of strategic experiments is the basic income trial (see Box 8

for further details). How were these initial experiments selected? Most bigger policy trials reflect the ongoing interest of government.

Nobody creates an agenda for the government from the outside. For bigger policy trials, the experimentation program was attached to ongoing topics.

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**Box 19. Finnish Basic Income Experiment**

The public debate in Finland surrounding basic income was based on several different arguments. First of all, SITRA had initiated discussions on the nature of future work: what will happen with employment after digitalization. If full employment no longer cannot be insured and more precarious employment, stratification and unemployment emerge, what needs to happen with the welfare system? Secondly, politicians were increasingly talking about abolishing income traps. Thus, avoiding situations when working "does not pay:" when accepting a job means a net loss in benefits and wellbeing of an individual and families. Thirdly, the meaning of basic income and its effect to participation and belonging in society was discussed. The topic has divided the nation in many ways: politically there are both proponents and opponents of the scheme in Finland.

The debate culminated with a basic income pilot being explicitly mentioned in the Government Program of Prime Minister Juha Sipilä's Government (29 May 2015) as one of the key projects for the government term. Within the centre-to-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.[134] The government reserved €20 million for the experiment and decided that the social transfers that are in payment can be used to finance the experiment. As such, unemployment benefits can be used as "basic income" in the experiment to create a much larger sample than the €20 million would allow.

As part of the government's analysis and research plan for 2015, a tender was organized to create a plan on how to organize the experiment. A multi-disciplinary consortium led by the Social Insurance Institution (KELA) was chosen to carry out the planning of the experiment; 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).

The time frame for the analysis was very thigh as government insisted that the experiment had to be carried out in the period of 2017-2018 as general elections will follow in 2019. The KELA-led consortium simulated many models with different levels of basic income and flat rate taxes for the basic income. The consortium released its preliminary report – with ambitious goals for the experiment – at the end of March 2016. This included a study design for the government. [135]

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 Constitutional Law Committee will raise the "equal treatment" principle in the parliament when the law changes for the experiment would be passed. Thus, every effort was made to make the "discrimination" of participants seem as little as possible, which meant that different amounts of basic income could not be tested; the amounts were downscaled to equal the net level of unemployment benefits (€560 per month): "Baseline somehow became the ceiling."

Secondly, with the limited funding available, it was clear that a full-fledged representative RCT was not possible. Within the fiscal boundaries basic income experiment was limited to unemployed people. This, in the final design meant that a random sample of 2,000 persons between ages 25 and 58, who currently receive unemployment benefits from KELA, was selected. The treatment group will continue to receive their benefit of €560 per month and when they get employed they will keep on getting the €560 per month tax free in addition to their wage. This means that in reality the experiment's costs can be zero Euros if no-one from the treatment group gets employed during the experiment.

Thirdly, the tight schedule coupled with the need to change regulations to facilitate the experiment and create an ICT platform to administer the benefits meant that the experiment was kept as simple as possible. The tax authorities simply said that "it is impossible to change the tax law so quickly" for the experiments benefit, thus, basic income is not

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[134] Kalliomaa-Puha L, Tuovinen AK, Kangas O. The basic income experiment in Finland. Journal of Social Security Law 2016; 23 (2): 75–88.

[135] Read further: http://blogi.kansanelakelaitos.fi/arkisto/3648

subject to tax nor is negative income tax tested. While the KELA-led consortium raised the issue of timing and the changes needed to make a fully representative trial possible with the government, the government was adamant – the experiment had to start in 2017. "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.

> Consequently, the 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 how much work their preparation actually takes. Nevertheless, the bill to the parliament was handed over in August 2017. The study design was accepted by the Constitutional Law Committee and the parliament passed the law coming into force December 29th, 2017, three days before the first money was paid out.

> The team administrating the experiment is hopeful that this is just one of many experiments concerning basic income – a starting point, so, that the framework can be expanded in 2018 and experiments with negative income tax and other forms and levels of basic income can be conducted.[136] This, however, requires fiscal and legislative changes that should be started already during the upcoming year (2017).

> However, the heavy association with the Sipilä's government makes those involved fearful that after the new elections the experimentation will be stopped. The new government coalition of 2019 will likely be the deciding factor, because whatever the results of the actual experiment, sceptics can at the moment make their case. Even if the experiment is successful, critics can say that the downscaled experiment is not representative or is biased.

> > 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 basic income was supposed to cover. So, there has been a lot of nagging connected to the experiment.

> > Nevertheless, 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."

215.     When it comes to the basic income experiment as the flagship of the experimental policy design program, it was overall negatively perceived by the officials interviewed for the preparation of this case study. This has become the focus point of experimentation and the basic income story has garnered a lot of media attention, not only in Finland, but also outside the country. As a highly politicized topic, its success or failure can start to shadow or eclipse the whole experimental policy design program. On the whole, many experiments deliver mixed results, esp. in the social context where problems are complex. Thus, the results of an experiment are subject to political/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.

216.     Hence, experiments can be in practice both used as vessels to take topics to the political agenda (having robust evidence makes it easier and safer for politicians to move forward), but "there is of course a danger that doing 'bad experiments' is used to swipe issues away from the political agenda." In regards to the basic income experiment, one of the experts involved with the program commented: "it will probably not kill the bottom up experiments, but it can affect the bigger policy trials."

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[136] http://blogi.kansanelakelaitos.fi/arkisto/3648

*Impact and effects*

217.    Effects of the experimental policy design program are at this stage unclear – it is too early to say. "We are hopeful that more forward-thinking organizations will carry the approach forward, so, eventually the majority will adopt the model." Nevertheless, the feeling at the PMO's level is that "it has changed the way we think about steering." Furthermore, other projects – e.g., SITRA's program Ratkaisu 100 for experiments and concrete solutions connected to Finnish 100 year anniversary – also enforce the broader emergence of an experimental culture. Nevertheless, ministries are autonomous by nature and the PMO cannot force public organizations to experiment. "There is no way one minister can make all the decisions; it is cumulative."  Some public offices are more supportive of experimentation (e.g., 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). As success factors the following observations were made:

> 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 7-8 years.

218.    Nevertheless, mid-term Government Program review is on the way and the concern is, whether the government has achieved its objectives. This means a self-assessment of PMO together with ministries to find out what the experiments have accomplished in early 2017. This will conclude with the government strategy session where a political decision will be made. "Probably the political objectives may not change, but the tools of achieving them might."

219.    From the division of different types of experiments the understanding seems to be that more simple, bottom up experiments are easier – "intuitive in a way, just need a bit of working on the attitude of people" – while bigger, more robust experiments requiring randomization are way more difficult as they require a lot of methodological skills to counter major biases which public servants do not possess. The initial feedback from government seems to be to concentrate more on "low hanging fruits:" simpler experiments that should show quick returns and provide the proof of concept. It may seem as downgrading of the initiative, but it is important to demonstrate elements of success and provide measurable outcomes to legitimize the work.

220.    What will happen after the current government? Are the seeds of experimentation rooted deep enough in the system to be independent of parties in government? It is too early to answer. While the basic income experiment is heavily associated with one party, the whole program is not perceived directly as part of a political agenda.  However, politicians also want to initiate new reforms programs associated with them – "everybody wants to put their own label on things" – which may affect the survival of the program in the future.

221.    The main challenges the experimental policy design program will encounter in the future are probably connected to the equity principle and ethics, legislative differences in sectors, generalization and fear of wrong estimates of the costs involved. Experiments put people into different groups, categories which violate the equality principle which dominates most legal discussions. This may become an issue for public debate similarly to the "lottery winners" of the basic income experiment. Furthermore, contextual factors were the ones that sunk RCTs in the 1970s. When experiments work in one context, it does not mean that experiments a priori work in another context. This is the main critique of experiments: lack of external validity. Furthermore, many small scaled experiments and bigger RCTs are not scaled up because of the fear of cost-estimates being wrong. In many ways this also characterized also the basic income debate. An expert asked: "What happens if this is a success? There should be a plan already."

**Systems approach to reshaping organization's purpose and working methods - Case study of the Child Protection Services in the Netherlands**

*Summary*

222.    Jeugdbescherming Regio Amsterdam (in English: Child and Youth Protection Services in the Amsterdam area (CYPSA)) is a regional Dutch organization certified to provide child and youth protection services in the Amsterdam region. From 2008 onward the organization has worked to redefine its purpose and working methods through the "Vanguard method", a system thinking approach based on the cycle of "check-plan-do". As a result, the organization adopted a new mission for its activities – "Every Child Safe, Forever" – and redesigned the whole system to fulfil that purpose and create meaningful impact. It was understood that only through changing complex family dynamics children's safety could be guaranteed. Thus, a new way with working with families, everybody present in a room, had to be adopted.

*Context*

223.    In 2008, CYPSA looked after around 10,000 children at risk with approximately 600 staff. The children were referred to the service by teachers, police officers, doctors or other professionals who saw signs of potential abuse or neglect. The parents can accept the involvement of the organization voluntarily or by court order if the investigation council deems it necessary. Also, children can come in contact with CYPSA through parole services if a court orders a suspended sentence for an offence. In each case, a range of welfare organizations can provide additional services to the children and families involved (foster care homes, mental health services, parental support groups etc.). At the time the change was initiated, CYPSA was working with three different services – voluntary care, state mandated care and parole services – and the organization was structured and organized accordingly. This resulted into a fragmented service provision as services were organized around administrative silos.

224.    The legal provision underpinning the system did not allow for sharing of files between case workers from the three different groups. As a result, when a child moved from one service to another (e.g., from voluntary care to a parole) evaluation of the needs of the child had to start all over again. Furthermore, as the profiles of the client groups of the three silos were somewhat different, collaboration between care workers was not well established – "parole doesn't do babies." The silos-type approach was reflected in the facilities of the organization from the physical infrastructure to the IT system of the organization.  Consequently, case workers also had very different working methods and limitations to working with children: for example, parole services were limited by the time they were given; voluntary cases were bound by the terms of voluntary engagement and high caseloads, while state mandated care by court orders lasted longer. Furthermore, in case of multiple children in a family, each child was followed by a case worker. Thus, it was not uncommon that families came in contact with very different case workers, in some cases even over 20 persons from CYPSA over the years. Case handling was highly disruptive as transfers from one silo to another meant that "the work started from scratch".

225.    Due to the highly bureaucratized system, CYPSA had an "infinite and costly cycle of micro management," while "case workers did not always know how to react to signals that children were not safe." The paperwork connected to the cases was immense: case workers had to fill out over 20 different report formats. "Most of the day went to filling out documents" and many case reports were "more than a hundred pages long." On average case workers spent 16 hours per week reporting on cases, rather than working with families. At the same time, formal reports in the organization did not measure what was important: the reporting system concentrated on quantity measures (caseloads number of measures, number of requests, number of kids in special care, kids flowing in and out, number of complaints, number of safety measures, number of plans, etc.) and not on measures related to the effectiveness of the interventions

on children's safety. At any one time, a social worker would be responsible for around 60 children, a court ordered guardian for 18 children, and a parole officer for 22 children.

226.      Extensive paperwork and protocols were used as protection against taking responsibility. People were "busy defending our own position, not creating value to the clients." Demonstrating that the protocols were followed was enough to say "we did everything we could" – this justified action and cleaning of caseloads. However, there was no way of proving that the case workers actually contacted families, if they were reached, because there was no working followed-up system.

> We were filling out these reports, calling families and then when parents complained and we had proof that we had done something. We thought that this model was keeping us safe, but that wasn't real.

227.      All in all, the system was characterized by incompatible objectives between different service providers and organizations providing them. Due to service silos, different CYPSA case workers were "stereotyping problems", treating the symptoms of children at risk and not the underlying causes. Thus, the short-term solutionism prevailed and the organization was concentrating on "quick wins" (getting children to services, but not finding out if they actually worked).

228.      Consequently, it was not surprising that in 2008 the organization was in crisis and was put under heightened supervision. Keeping up with the micro-management system meant that CYPSA was facing financial bankruptcy, although, nobody knew at the time what this meant in the public sector system: "after an audit the inspection found that we were out of money – bankruptcy or what?" Internally the vice-directors felt that the CEO of the organization was not fulfilling the mission of the organization. The CEO had a background in the system, so, there was no motivation of doing things differently: "Nothing changed; it was a manner of survival, howling with the wind." There was no more trust in the CEO and the directors communicated this to the board of the organization. As an initial reaction the board sided with the CEO and one interim director was immediately fired, while the others stood their ground and built pressure on the CEO: "You need a critical mass of people who don't turn around." This resulted in the resignation of the CEO.

229.      An intermediary CEO took control of the budget and got the organization financially back on track. In 2009, a new CEO came on board, with a background in local politics and no prior in-depth experience in child protection services.  He collected ideas inside and outside the organization on how to make changes and make the system work again. "He was open to a lot of ideas on how the organization could be changed." During this time the CEO with the directors opened a discussion within the organization and asked the employees why they thought the organization existed: "Why are we here? What is the problem? Why are we in this crisis?" A lot of different opinions emerged, but during the process discussions became more focused. While the nature of the discussions was more horizontal, the focus of the reform was set more top-down by the leadership.

> The directors really knew where they wanted to go, but they gave us the space to go through it as if it was our own process. The expectation was that we would come to see the same things that they had seen.

230.      As such, the leaders opened up the discussions to the staff in the hopes that also they would reach the conclusion that ultimately the organization was there for the children in their care. While these horizontal debates might have been derailed by other issues in the organization, the real issue prevailed – the organization was not keeping children safe. A bottom-up process of visioning followed; this helped to create a new shared mission for the organization – "Every Child Safe, Forever." Based on these

discussions a five-year plan of change was put together. The leadership of CYPSA was open to restructure the whole organization. Program management was set up which focused on three major elements: case management methodology, development /learning and, finally, a professional working environment.

231.    The leadership went to the evidence base and asked "how do we do that, how do you get children safe." It was agreed that a systems approach was needed and should focus on relationships and building a family plan. A family-based methodology already existed: the Functional Family Parole and Probation services (FFP) was developed for juvenile probation and the organization was already experimenting with FFP in the parole services. The method is based on an evidence-based model of case management. This working method relies on family engagement and strength-based care – family as a system to tackle for a child's safety – "the whole system in one room." The idea is to protect the child through changing family patterns. In the process "it was helpful to already have a HOW – the FFP – on what to do." Consequently, the organization started to develop an Intensive Family Case Management (IFCM) system in 2010: one case manager as central contact to the family and care providers, experience spread through weekly multi-disciplinary team meetings (MDTMs).

232.    How to bring the whole system to a totally new way of working? CYPSA had already experience with a systems thinking approach: in 2008, the organization had used a Vanguard consultant to implement a change process in the youth parole services. The method was based on John Seddon's "check-plan-do" framework of systems change described above in the report. However, the project was deemed a failure – it only approached one silo within the organization and there was no acceptable evaluation, measurement system to back up the changes, hence, the parole workers did not see the impact of the change. Combined with short implementation times – the project lasted 12 weeks, with the initial "check" a week (which was too little as a whole to work through what the new method/way of working was about) – and lack of involvement of operational managers from CYPSA, the project did not succeed. "The experiment was too isolated from the whole organization, from the broader context." However, the method was deemed a success: "The project didn't succeed, but the directors though that it was good enough to do try it on the whole organization." Based on the experience, there was an understanding among the directors that you could not change – however, well-designed the process is – if you were not going to change the overall system.

233.    While the organization still had a change fund, it was not enough to kick-start the process nor to carry it out in full. The leadership wrote a social business case to the municipality outlining the potential to "do a better job." Also the Ministry of Justice, to whom at the time the organization reported to, was tapped for money. "The CEOs connections in politics were very good, he was good at getting into the agendas of the people and putting our thought in the words of politicians." Furthermore, the seriousness of the situation was made clear to politicians:

> We said that we couldn't do things in the old way anymore and if we didn't have funds, then children had to go on a waiting list, until we implemented the change. That is quite a nasty political statement. Then we told all the stories of these children to the politicians.

234.    It took quite a while to put the funding together, but in the end, 1.5 million Euros was drawn from the organization's own fund, 1.5 million Euros was received from the ministry and 1 million Euros from the municipality. Having the resources in place the full change process was initiated.

235.    Furthermore, during the change process CYPSA, like the rest of the child protection service providers in the Netherlands was expecting a reform of the system and a new youth care law. For 2015 a change in youth care responsibilities between governance levels was planned and child protection services were moving from the central government (ministry) to the municipal level. CYPSA knew that with the

change the organization had to take the most difficult cases and easier cases went to local services. This meant that the quality of the service had to increase, because their new client base needed more help.

*Initiating a process of systems change*

236.    The renewal of the organization started in full in 2010 with the change in team managers of the system. The directors of CYPSA wanted to be sure that the leaders of the organization shared the newly defined purpose of the organization. That they were "purpose living." Team managers had to reapply for their jobs in 2010 via a process with external experts that knew the organization very well. Five team managers left the organization based on this process. Initially there was quite a lot of resistance to change, but the leadership stuck to the plan and a lot of discussions were held.

> First there was quite a lot of resistant to change. It is just another change and everybody was tired of the constant changes. That is the thing behind the fundamental change – everybody felt and saw the change, it came from the bottom up, not top down.

237.    In 2011, a more systematic change process was initiated to lead the whole organization towards new working methods. Vanguard consultant guided a development team of 10 case managers and two team managers through the process of "check-plan-do". The consultant had exceptionally good leadership skills and believed in the change process.  "You need one person to light the fire, there probably is no other way."  The first group was selected carefully; the top leadership of CYPSA looked for traits of insurgency – willingness to question the status quo – within the people.[137] Around 20 people were asked to do presentations to the selection committee; they were asked to reflect on their own actions, their ability to perform in front of a group and their creativity was evaluated. They ended up with people from different backgrounds and age frames; however, due to the gendered nature of social work nine of the core team of ten was women.

238.    The leadership gave a "carte blanche" to the initial development team. The directors were pulled into the process quite often – "we didn't push, we let them pull" – to explain their vision of the process, overall system, help the consultant. It was initially difficult for people to think outside their domain. Nevertheless, there were some guidelines: there needed to be one work process for the whole organization, one methodology (end of silos) and the team had to consider FFP as a working method. The idea was that the same service would be given to families depending on the needs of children's safety (staying with the families for 6-9 months) regardless of how they came into the organization – voluntarily, by court order or through parole.  However, outside of that, the team was free to experiment. The development team worked together for 3 months and they went through a full "check-plan-do."

239.    In the "check phase" current activities were evaluated and a sense of urgency was created. The team worked through 60 case files and looked at activities that added value and what did not. In 53 out of 60 cases families did not improve or got worse because of the intervention. It was "truly eye-opening" and "depressing:" the organization was not clear about its focus. The process was designed to get people out of their comfort zones and make them ask: how do I do my job, how should I do it, how far I am from doing it the right way? However, "we had to be clear that it is not an individual failure, but the system's conditions produce this result." "System was guilty of the result!" Safety of the children needed to be put first and for that, new family patterns created to guarantee children's safety. This created a common shared vision of the system – "this is my goal, this is my client." Then on, the process from the clients' point of view was analyzed. The findings of the process are described in Figure 18.

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[137] For example one participant described: "In one case we went to court and took the kids away from the same family 3 times in the last six months and nothing changed, the next day they were back with their family. I said that I won't do that anymore. Things needed to change."

**Figure 18. The Findings of the Check Phase**
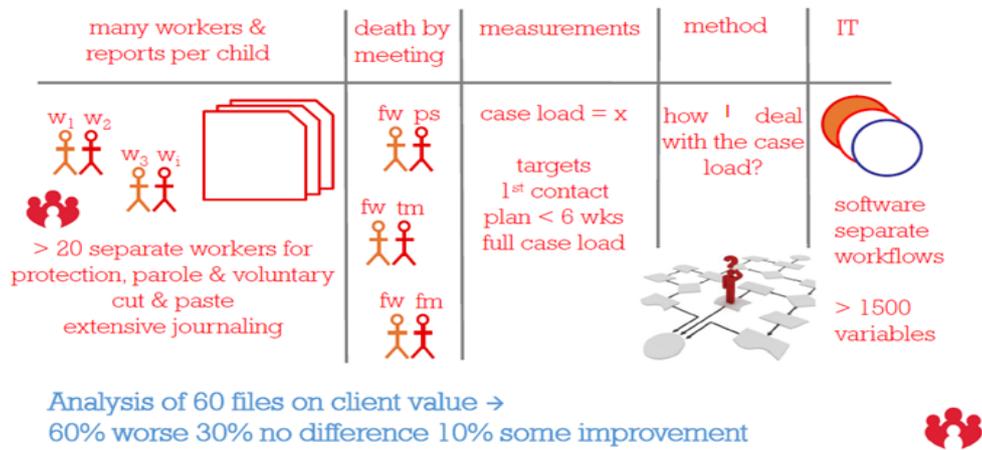


Source: Waters and Dinkgreve 2016.

240.    In the following "plan" phase the development team created a vision for the organization. This was not an easy process: "It was difficult to sometimes to comment ongoing processes, say that something was done wrong, talk back to the director and to say that you have to do this, so, we can move forward." Nevertheless, "it helped to understand that the only one that can change the system is you yourself. You just need the balls to talk back to the directors."

241.    The purpose of the system was revisited and the concentrated on the important steps and identified the "waste" in the system. Figure 19 sums up the findings of the "plan phase".

**Figure 19.  The findings of the plan phase**
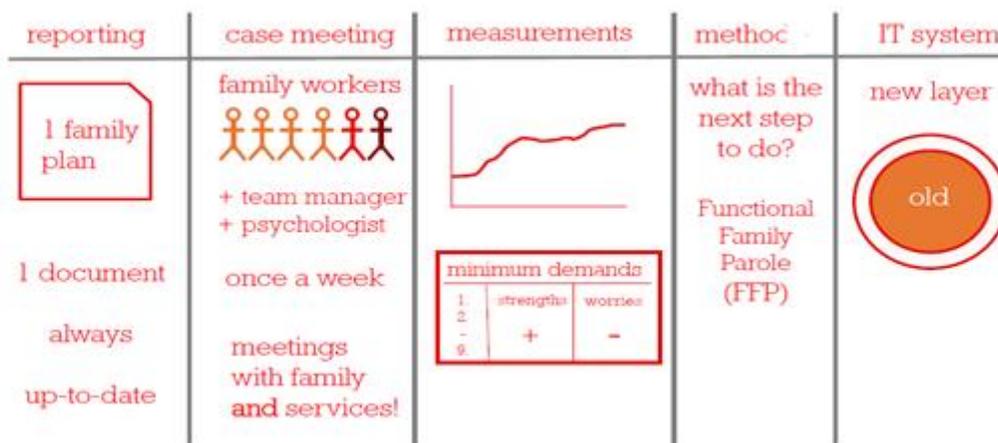


Source: Waters and Dinkgreve 2016.

242.     They worked out a "one family, one plan, one worker, one method" approach based on the existing methodology, FFP. First and foremost, within the new working method the whole system is brought together into one room – parents, children, grandparents, neighbors, teachers etc. This helps to take away the "privacy issue." There are now three phases in an engagement with the family: 1) engage and motivate 2) support and monitor 3) generalization.

243.     Secondly, a purpose driven approach was adopted – "if you know the strengths of the family, then you know which strings to pull to help." The change consisted of four main elements:

- protection-oriented to strength-based care

- problem-driven to pattern-oriented care

- standardized to tailor-made care

- from process-oriented to purpose-driven care.[138]

244.     This resulted in a process in which:

> In the first 6-12 weeks, meetings are held with the family as often as necessary. The intention is to build trust, so while the causes of the safety issues are addressed, the case worker does not rub the families' nose in all of their problems all the time. The basic assumption is that families have a noble intent but that for some reason they are not living up to this. Case workers look for strengths in the family that they can build on. They do not utter judgment and need to respect the ways of the family. But it is paramount that the safety of the child is discussed and if they refuse to do that, then this constitutes an issue that must be addressed. The case worker does this by increasing the families' insight in the harm that children are exposed to. [139]

245.     Thirdly, smooth transfers of families from case workers (if they change) were guaranteed: case workers always have to meet and find the counterpart to give over a case. Each team manager now coaches two to three teams comprised on average of 7 case workers, one senior case worker (supervisor) and a psychologist  (previously 20 people teams). Teams are, thus, to an extent autonomous, so, that in principle they have all the required skills and can do everything that is needed to meet their purpose. Nevertheless, personal characteristics also play a role as it is very important to find a match between the case worker and family. Figure 20 provides a snapshot of the new system.

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[138]  Van Veelen, J.S.M., Regeer, B.J., Broerse, J.E.W., van de Poel, S.F.P, and Dinkgrve, M.A.H.M. (2017) Embedding the notion of child- and family-centered care into organizational practice: Learning from organizaitonal visioning. Journal of Public Child Welfare. Forthcoming.

[139] Waters and Dinkgreve 2016.

**Figure 20. Purpose-Based Process Model**
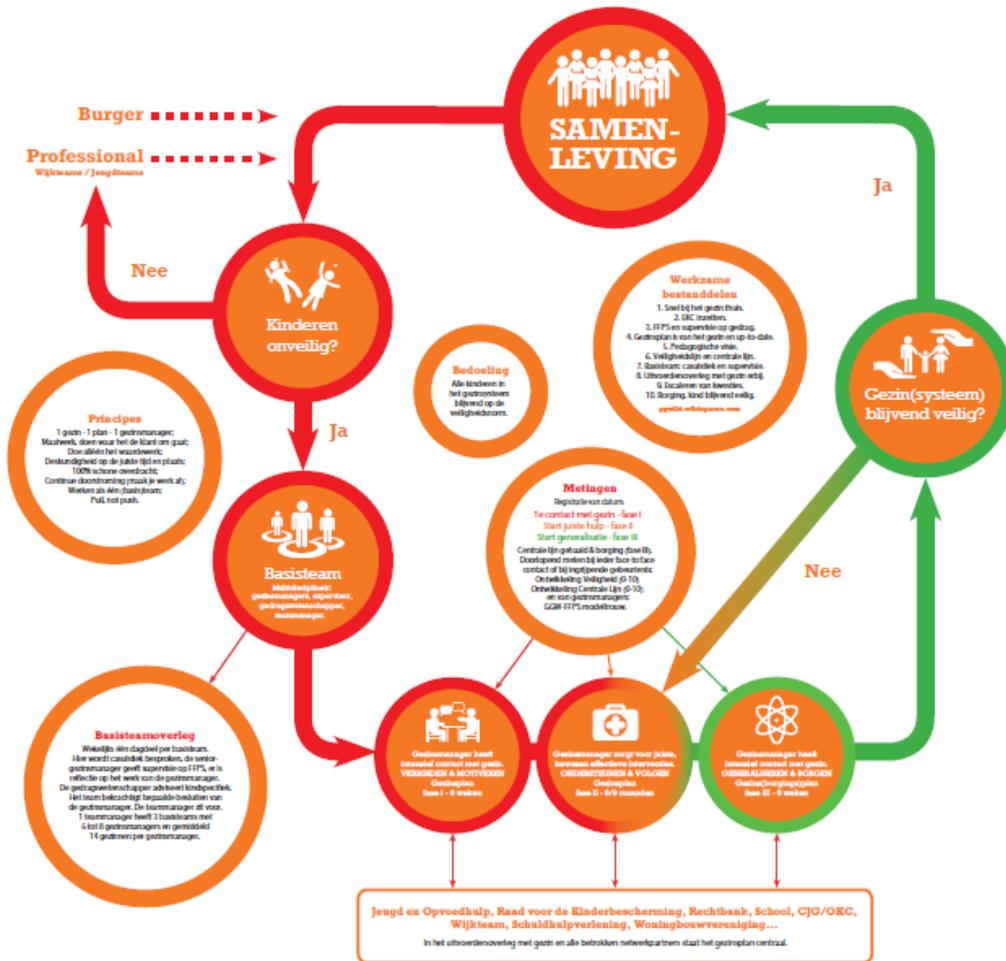


Source: GGW - FFPS: Generiek Gezinsgericht Werken - Functional Family Parole Services. June 2014.

246.     The first development team was happy with the process: "I am spoiled for the rest of my life, because it was an ideal way of changing the system." With training from the Vanguard consultant they became the so called "tour managers" for the rest of the teams to be "rolled in" to the new working method, essentially guide the rest of the organization in different cohorts through the check-plan-do phase.

247.     In December 2011 a pilot was initiated with six teams (five to seven case managers, one psychologist and one team manager). After the success of the pilot approximately 20 remaining teams were guided through the condensed check-plan-do process in three cohorts. The teams got 3 weeks off from work, where other workers in the organization had to take over their caseloads. In week 1 they went through "Check" and "Plan". They analyzed their way of working, case files, value demand – depression usually followed. Sense of urgency was created: "Everybody needs a personal crisis."

> In these circumstances the target shifts quite soon, but sometimes is difficult to stay alert and on target later on.

248.      In week 2 and 3 the old files were transferred to the new ICT system that supports family work. In the 10 weeks that followed they went through "Do". After the initial week of check the "tour managers" stayed with the teams for 3 months to help them shape working methods. People needed to learn how to write about families in a different way, in a one-page word document, succinct and clear about the priorities. This is needed for the weekly meetings, so, all the participants can read the most important things. For many this was a big problem and the "tour managers" needed to talk to people separately. Not everyone was capable of doing it: "People were on board in the beginning, understood the in the moment, in the beginning, but were unable to follow through /…/ We only later noticed that." A complete "rolling in" (rather than rolling out) took a full quarter.

249.      The overall process with different cohorts took more than a year – until June 2013. In reality the change process lasted more than three years taking the whole organization, ca 40 teams (finishing with the facility teams) through the journey.  Every round ended with discussion, evaluation and feedback into the system. The sequencing of these teams was determined by the closing down of their offices, so, the new teams could start in their new offices after the 3-week period was completed. This meant that the change resulted in a physical change that people could touch. However, there is some doubt in the organization about the wisdom to plan the change process and the cohorts in accordance with the closing of offices, maybe volunteer units should have been preferred.

250.      The facilities were designed in line with the new working methods: family-based filing option in the IT system; open office, no assigned place; company catering with former clients as servers; and pictures of former clients and mission statements on walls – everything to remind workers their mission to keep children safe (see Figure 21). As one employee described: "Everything from the color of the walls and carpets on the floors is considered from the perspective of how does this help us keep children safe," and another drew the process together towards quality and purpose of the system as: "Less, but better coffee."

**Figure 21. Examples of New Facilities**



Source: Foekema, J. (2016) Youth Protection Amsterdam flexible work design, mobile office work and e-case management. Every child safe – forever. Presentation.

251.    The idea was that case managers should be 80% outside of the office (instead of behind the desk), so, they got laptops, smartphones with mobile data connections, public transport cards, access to shared/public car parks etc. Looking back, in terms of facilities CYPSA, all the changes to support the new system should have done right away: for example, the option to classify data according to families and not individual children was layered on top of an existing IT system in the hopes that a new system would be designed afterwards.  Thus, the primary process of work – how the organization really wanted to work – was not mirrored by the system and CYPSA is still working on the new platform. "We should have gone for a new IT process from the start." At this level of transformation piecemeal changes do not work.

252.    Support services were outsourced to maintain flexibility. The organization was consolidated in one office, mostly now used by the administration and team meetings once a week.

> Before there were seven different locations; no policy in how to distribute people in the rooms, everybody was at their offices, behind their desks. Everything was designed to facilitate paperwork. People were asking for more drawer space just to store all the paper.

253.    In general, facility managers need to know more about the activities:

> We need to continuously go through the "check" phase. Are we really helping people and helping to keep children safe. It can be quite annoying to people if they just want their pencil, but we need to know more about the work to actually help them. Being continually conscious of this is still difficult.

254.    The change, however, created new challenges and issues within the system. First and foremost, problems with the existing capabilities and characteristics of the staff raised its head.  The general staff did not have to reapply to their jobs, but the "normal annual performance cycle did show that only 50% of staff performed according to (the new) expectations." [140]  The employees got two years to start performing in line with the new expectations or they were asked to leave. The changes showed that the overall "IQ of the organization needed to go up." This was not an easy process for team managers without personal hardship:

> You had to have really clear conversations with people. It wasn't about them as people, you still feel loyal to the person… they just weren't capable working in the new system. People had a lot of problems with feeling safe within the organization.

> People get very personal, teams have worked together for a long time, but when co-workers see what is going on in actual families, they stop sheltering their colleagues and understand why we needed to part ways.

255.    There were several waves of leavers: after the change ca 40% of the workforce left; after the economic crisis, another group of people left in 2015 when the jobs came back to the market. "People were not right for the job." In essence, this meant a five year process of employee removal. Still, the annual turnover rate ca 20%.

> Maybe it was too much responsibility in too short of a time especially for new people. How to protect the new case workers? There are some mindfulness and vitality trainings, but the work is very demanding.

256.    Meaningful measurement became a core issue within the office. If an organization is "living a purpose" then that needs to be measured. Thus, CYPSA started to measure "acute child safety" by simply

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[140] Waters and Dinkgreve 2016.

rating the situation with a score of 0 to 10 where a five is insufficient and a 6 just OK (see an example of measurement in Figure 22). Statistical process charts are made concerning how long it takes to complete a phase of work. Other management information concerns capacity planning (with how many families in what phase of the process). Additionally, teams conduct an internal peer-to-peer audit once a year. This is not to enforce top-down control, but ownership.

**Figure 22. Acute Child Safety**
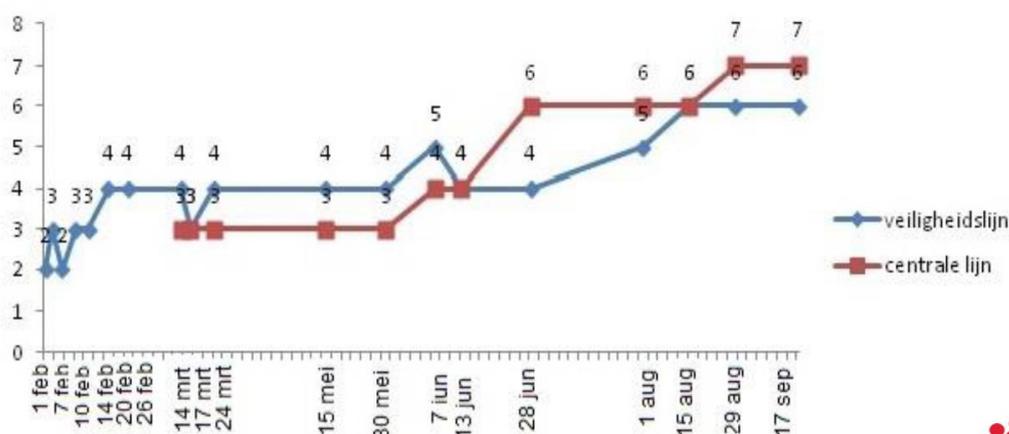


Source: Foekema, J. (2016) Youth Protection Amsterdam flexible work design, mobile office work and e-case management. Every child safe – forever. Presentation.

257.	But mainly, the major feedback loop is created through 3-hour team meeting – MDTMs – once a week. Other meetings were cut to keep everyone on the same page and to go over the family plans together to learn and reflect. This also means that information is shared and families are not any more "clients of individuals, but clients of the organization." During each weekly meeting 8 to 20 cases are covered. Previously, team managers had up to 20 meetings per week, with case workers averaging 5-6 meetings. Now the MDTMs also count towards the registration of the case workers license.

258.	Still, the organization is dependent on services from other organizations (foster homes, mental health services etc.) that have not gone through the systems change, have not prioritized their activities and are under financial pressures. For this, the leadership designed an issue management protocol for CYPSA. Whatever creates a blockage that cannot be resolved at a lower level (after having tried), is referred upward and critically reviewed. This includes issues around cooperating with network partners where the CEO might have to step in and negotiate with partners at a higher level.

*Impact and effects*

259.	The result of systems change in CYPSA was very impressive. and also seen in numerical terms. Employee satisfaction with the working conditions grew from 6.3 to 7.5 (6.9 national average in similar organizations) and total annual costs of facilities (including IT) reduced by 32%.[141] Costs per user reduced

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[141]	Foekema, J. (2016) Youth Protection Amsterdam flexible work design, mobile office work and e-case management. Every child safe – forever. Presentation.

by 22% (taking care of an entire family in 2014 were only marginally higher than taking care of just one child in 2011), while the quality of the service increased. Client satisfaction rose from 5.8 to 7.5 (on an 11-point scale).[142] This meant a return on the initial investment within 1.5 years. Furthermore, due to the change in nature of the service fewer references to specialist services were required and courts were less involved in compelling parents to cooperate with the service (see Figure 23) – use of legal instruments reduced by 60% and legal guardianship (by a case worker) decreased by 16% (while it rose nationally by 3%).[143] The leaders acknowledge that in the best case scenario there would be no court referrals at all, because there would not be need for any – "Our goal is to have no court based emergency placement; our purpose is to be non-existent and the children safe at the end of the line."

**Figure 23. Reduction of court measures**
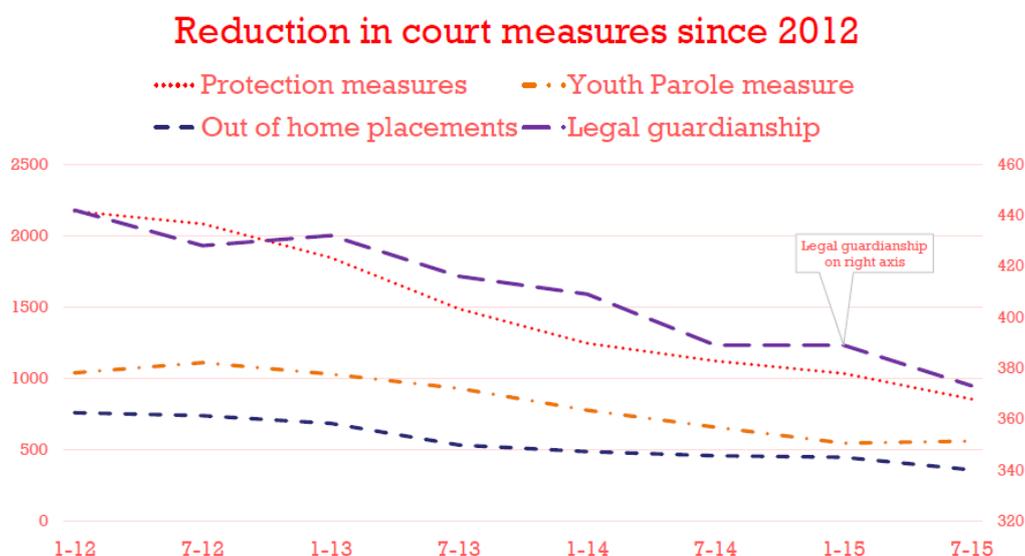


Source: Foekema, J. (2016) Youth Protection Amsterdam flexible work design, mobile office work and e-case management. Every child safe – forever. Presentation.

260.     Nevertheless, evaluation and comparisons with other service providers in the Netherlands are quite difficult as comparisons are not done in a meaningful way:

> Evaluation is quite difficult. We can evaluate if we are doing a better job, but to compare with the before… we have changed so much. We are not representative of the rest of the country anymore; the starting point is so different.

> Everybody in Holland is at the moment reducing the measures like court cases, but as our measures are so much lower compared to others; we don't have anywhere to go. But we are still told to reduce. We are so ahead of the game, but still compared to the game…

261.     While the systems change was impressive, it was not without its challenges. The broader system has not changed and some bureaucratic requirements have remained. Do case workers have to have separate evaluation sessions for their license within the organization, if they do it already as part of their

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[142] Waters and Dinkgreve 2016.

[143] Ibid.

weekly MDTMs? This issue was solved, but during a recent audit it was discovered that a questionnaire that was required by law was not used by most case workers. While the organization sees that the questionnaire does not benefit the core mission of keeping children safe, it can affect CYPSA's license.

> The last audit showed that in connection to parole a specific questionnaire is not done. It is really useless, but it is a legal obligation and this might make problems for our license.

262.     The organization, through the change, has become so purpose-driven that there is a risk that broader accountability system – that has not changed – gets forgotten and this can hurt the organization in the long run.

> We have to become better at keeping our promises. If we say that we are going to do something then we should do it, even if it doesn't make directly sense with our mission.

> They say that we are best in the country,[144] you are really doing a good job, but you also need to stick to the regulatory agreements, otherwise they will take our license away. It is very frustrating, but it also shows that it (systems change – editor) is a little bit illusionary… we exist in a larger context.

263.     In addition to the aforementioned, the resources of CYPSA to guarantee a quality service continuously is a major challenge. Resources of the organization during the change were stretched thin.

> The biggest challenges with systems change are money and time. You need money to create time to implement the changes. Later on you need endurance to stick to the change.

> The most difficult part was that the organization had a workload, still has a workload and had a workload during the change process. However, everybody needs to have time to go through the process. It is still a struggle to find time for development.

264.     However, CYPSA had stable leadership during the change process. While in 2015 the CEO left, the two of the directors remained. "It is a big city; things don't change so fast here." Nevertheless, with the child protection system reform in 2015 the work has also become tougher – CYPSA now takes the most difficult cases from the region – multi-problem families, while simpler case go to local services. This means that turnover (annual 20%) and sick leave are high. While the caseloads went down (now between 10-14 families; before 22 parole, 18 youth, 60 voluntary workers), these numbers went up. Also the content and expectation of results of the work have changed. CYPSA insist on tailor-made care programs and not offering ready-made, available – "this is the best we can offer" – solutions. Thus there are long waiting lists[145] which both present a moral and a political problem to the organization:

> Waiting lists in our area are really politically incorrect. Our alderman gets bullied a lot in the newspapers about this.

> There is a moral dilemma: can you put children in these circumstances on a waiting list. We have a responsibility to the families.

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[144] Indeed, the organisation is also been internationally acknowledged: CYPSA won the European Public Sector Award for the category of local government in 2015.

[145] One CYPSA employee explained: "There are two types of waiting lists: new families are weighted on children's safety and if it is not critical then they are put on the waiting list. But can we be sure that they are safe 3 hours from the evaluation, the next day? The other type is when the case workers leave and cases are taken over by others."

265.    Due to the changing nature of work –strength-based, problem-driven, tailor-made, purpose-driven care – finding the right people to do the job has become a crucial issue.  "We need team managers and case workers who are purpose living." This means that different kind of people needed meaning a fundamental change in the recruitment and training system of the organization. The strength-based system requires that people do not "take over" with families.

> Families get under yours skin, you can see terrible things, but you need to stand by and not take over. Most social workers want to take over and lead in such situations.

> We need people that want to save the world, but also know how to shut the door behind the work when they go home. It is very difficult to save people, you need to be happy with little things, little improvements.

266.    CYPSA devised a new recruitment procedure in 2012 combining personality assessment (empathy, self-reflection, support without taking over, ability to direct/authority, orderly, collaborative etc.) with an IQ test. Nevertheless, the organization still has trouble finding the right people who would also reflect the mix of families they are dealing with. As such, it is difficult to find case workers from diverse backgrounds that would reflect the variety of families CYPSA deals with. Most new workers come in after experiencing the system during traineeships through school (in the university, during the third year there is a 10-month internship during which new people join the teams at CYPSA). This becomes a "recruitment floor" for the organization, people already familiar with the working methods. High turnover rates and lower influx of people adds to stress – "the staff gets exhausted" – and the waiting lists.

267.    Due to the changing working method, training needs have drastically changed**.** In 2012/2013 the organization started to develop its new training method. They opted for a shift to a more extensive program (8-month training program for new workers) with more reflection. "It is needed as our working methods are not thought in school." With developing these programs, the CYPSA is by now making profit with its academy by training other social teams in the municipality, higher education schools, voluntary workers and giving courses at hospitals.

268.    CYPSA is especially interested in showcasing the project and new way of working to service partners. However, initially the organization was heavily focused on its internal change process and external partners were little bit side-lined – "we became a little bit arrogant, that we knew better."

> We were very focused on our own process and we didn't involve external parties enough; only direct stakeholders. It was a bit arrogant, inflexible to later on say to external parties that we had the best solution in the world. It was not surprising that the surrounding organizations were not enthusiastic. But we are working on external engagement now. It's in an ongoing process with judges, the board of child protection, external service provides and colleagues in the rest of the country.

269.    At the same time, the organization needs supportive services – e.g., from mental health workers to do their job.

> These families encounter a lot of complex problems coming from drug use, alcohol, mental illnesses, depression. Mental health workers tend to work with individuals, while the need would be to look at them also as parents. This is a whole new area.

270.    This is a public value debate: what is more important – the parent or the child – and most service providers have not looked at their purpose in this light.

At first, we were obsessed with spreading the word, talked about unnecessary division of labor – for example, domestic violence. But then people said, wait you are talking about my job!

271.      Nevertheless, the approach has diffused to a degree in the Netherlands: Zeeland run a small scale project to test the methodology and currently the child protection services in the Hague are going through the same systems change. In both cases the same Vanguard consultant was involved in the project. However, in Zeeland the systems change failed. It was designed as a small-scale, sped-up process: "they tried to do the same in Zeeland in 3 months that we did in Amsterdam in 3 years." In the Hague there is a similar size organization to CYPSA in Amsterdam and the process is comparable. However, you "cannot just copy it," the process is adapted to local specificities: e.g., operational managers are more involved in directing their teams through the rolling in process. Furthermore, the failure in Zeeland highlighted that top management needs to back the process and sometimes people just do not fit: "it's also a personal thing, you need to have people on the floor who understand why the change is needed." This highlights one of the deficiencies of the Vanguard method: the method assumes that everything is about the system. The personal element and the effects of organizational culture are not acknowledged.

What I have seen in my work is that connecting and matching the right people is really important. You need different people and different skills sets to make the change work.

Vanguard was a starting point, not a perfect methodology, but it created time and space to review our actions and follow up with issues.

272.      On the whole, the Netherlands is open to adopt new management perspectives, but there is also a danger that the purpose behind the systems disappears.

The Netherland is on the whole curios, organizations are open to all kinds of hypes and trends every 6-12 months. From a system development perspective this creates a lot of frustration and anger.
So called innovators are mostly warm about ideas and not about if they work on the floor, within the system. It is not just about great ideas.

273.      This is the main takeaway from the case: stability and consistency in adapting the systems change is the key behind a successful reform.

**Using Systems Approaches to Regulate the Sharing Economy – Case study of public transportation in Toronto (Canada)**

*Summary*

274.     Disruptive technological change and the emergence of the platform economy – specifically sharing economy – is at the core of this case. Technological change produces new models of providing services, with new types of supply and demand, which does not fit into legacy economic models regulated by government posing a challenge to policy while shaking up incumbent industries.

275.     In Canada, all levels of government – city, province, federal – are impacted by digitalization because different types of policies connected to the emerging fields of the sharing economy (housing and transportation bylaws, insurance, taxation etc.) are regulated at different levels of government. This creates a problem: who has ownership over the issue. Nevertheless, regulators needed to catch up with changing technology. Confronted with Uber starting to operate in Toronto in 2014 without specific regulatory oversite, the city had to move quickly to regulate an unusual company and appease an alarmed incumbent industry. To tackle the regulatory challenge while simultaneously ensuring that the beneficial aspects of a sharing economy could be preserved, an independent arbiter MaRS Solutions Lab facilitated productive dialogue between different stakeholders. Utilizing systems thinking and design methodologies, they proposed a user-centric vision and sharing economy city strategy for Toronto (and by extension cities across Ontario) and contributed to a new form of legislation that enables the city and its citizens to both regulate and benefit from new entrants disrupting old businesses.

*Context*

276.     The sharing economy was an emerging topic in the Canadian public sector in the early 2010s. But no substantive push for regulation had yet reached critical mass and governments across Canada were moving on different trajectories in response to the sharing economy. For example, in January 2016 Edmonton became the first city in Canada to pass an Uber-friendly bylaw stating that Uber drivers could get a license if they had Provincially approved insurance. However, as it was a relatively small locality, the law did not catalyze similar legislation across Alberta. As one observer complained: "the problem in Canada and elsewhere are the amateur politicians. They want to put a stamp on the regulation – Made in City X – while a lot might be learned by looking elsewhere." Overall, either because of the search for the "perfect regulation" or a lack of impetus, the governments were slow to react.

277.     Nevertheless, different levels of government had been working on their own sharing economy "files," especially at the Federal and Provincial levels, but a push for concrete regulation had not yet materialized. Ontario opened their sharing economy file in 2015 with up to seven ministries involved, but there was no clear lead other than the coordination role provided by the Office of the Premier. However, the Province did not see itself as a key actor in determining regulation: the principal issue under their administrative authority seemed to be regulating appropriate insurance products. Most sharing economy issues such as labor laws and taxation are connected to municipal bylaws or federal law. Ontario´s sharing economy advisory committee did prepare initial reports, but they did not provide concrete procedural recommendations. This was in part because officials struggled to articulate exactly what the problems and opportunities really were. Said one official, "we didn't know where to point our lawyers." Meanwhile, the Ontario Chamber of Commerce prepared the first regional conference on the topic in March 2015 that subsequently lead to the publication of several sharing economy reports (e.g. the Mowat report).[146]

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[146]  Mowat Centre is an independent public policy think tank in Ontario. The report can be found here: https://mowatcentre.ca/wp-content/uploads/publications/106_policymaking_for_the_sharing_economy.pdf

278.     At the federal level, a senior committee was established to identify barriers to innovation including the sharing economy under the narrative "Are we missing the boat?" The committee was an interested team of experts from across government – a tiger team – charged with considering the sharing economy and potential regulatory gaps. The team prepared an overview report entitled *Back to the Future* in February 2015.[147] They commissioned a second phase overview (regarding tax revenue, social/employment issues, public safety, innovation) that concluded prior to elections in October 2015. However, the reports seemed to have minimal impact in part because the principal lead, Deputy Minister in the field of innovation, did not have direct authority over the issues highlighted. However, members of the tiger team would later participate in MaRS Solutions Lab workshops and contribute insights gathered in their reports to foundational research conducted by the MaRS team.

279.     In the meantime, large scale tech platforms such as Uber and AirBnB had become the posterchildren of the sharing economy, pushing their businesses and in some cases regulation forward at their pace while arguing that disruption was inevitable. Yet, both companies have very different strategies for dealing with regulations: Uber is generally deemed to be more aggressive while AirBnB tries to look for ways to work with regulators. As one interviewee noted:

> AirBnB has gotten a free pass in Toronto (while already being regulated in Vancouver with severe restrictions). The aggressive tactics of Uber really played a role in pushing the issue forward.

280.     Due to Uber's more confrontational strategy, the company was at the forefront of regulators' concerns. Said one official, "*AirBnB is simply not on our radar*." And as is true in many municipalities, the city of Toronto tended to struggle with being proactive in the face of new challenges. In 2012 Uber came to Toronto and opened business first as a technology company dispatching rides to taxi drivers while building up public awareness and a client base. During this time, the city of Toronto finished an extensive taxi review – one of the biggest consultations the city had conducted. Yet it did not include car-sharing or Uber in its analysis, reflecting the City's lack of anticipatory systems thinking capacity that would enable authorities to tackle emerging issues such as disruptive technologies. The Municipal Licensing & Standards (ML&S) Division who was responsible for the review and had administrative authority over taxis had long operated in a traditional enforcement capacity rather than leading norm creation. For instance, ML&S's remit covers taxi licensing, but also includes pet adoption, dead animal removal and bylaw enforcement such as fireworks, noise complaints and garage sales. The challenges presented by car and home-sharing business platforms were outside of the realm of expertise and therefore challenged the city's organization structure that favored administrative action:

> The city has really good capacity from an engineering lens: planning subways, roads, etc. But it does not have capacity to talk about wicked problems, about geographies of neighborhoods. There is no concrete dialogue about homeless shelters, poverty etc.

281.     Traditionally there is a time lag when dealing with problems in the public sector, but in 2014 Toronto was confronted with a crisis: UberX had launched and started operating in the city. This was a problem that the city had not encountered: how to deal with and regulate a multi-national enterprise with sophisticated lobbyists and lawyers, especially in a regulatory domain where there is no easy common compromise (i.e. the city will be picking winners and losers via regulations). The city needed to develop intelligence about what was happening now that Uber was operating; factors such as employment, economic rents, service levels, public safety. etc. were made uncertain by the presence of Uber. However, the first "knee-jerk" reaction by the authorities was to go to court and file for an injunction to stop UberX from what it deemed to be an illegally operating business, an action supported by the taxi industry. But the injunction was rejected by a judge who ruled that the city's bylaws did not apply to Uber's business model.

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[147] http://www.pco-bcp.gc.ca/index.asp?lang=eng&page=innovation&doc=rpt1/index-eng.htm

In the meantime, the new mayor of Toronto publicly expressed his support for Uber saying "Uber is here to stay" citing Toronto's role leading urban innovation in Canada. Citizens were also validating UberX's value to the city with high usage numbers and generally positive reviews. All of this put public officials under significant pressure to either legalize or stop UberX, forcing the City to become a pioneer in regulating the sharing economy.

282.    In 2015, the MaRS Solutions Lab offered to help to the city to prepare regulation for the sharing economy. The Lab is located within the MaRS Discovery District, an urban innovation hub, in Toronto that works with corporations, investors, mentors, university institutions and labs to accelerate innovation.[148] MaRS Solutions Lab had received grant funding from the Government of Ontario to work on regulatory burden reduction and levelling the level playing field in the field of sharing economy (see the background in Box 9).

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**Box 20. MaRS Solutions Lab – the Road to the Sharing Economy**

In 2011, there was high level political interest in cutting red tape and addressing "*sticky issues*" at the Ministry of Research and Innovation in the Government of Ontario. This interest was latent to a degree, but was brought to the fore by a conference that included several presentations about design and systems thinking from organizations such as Mindlab in Denmark and Helsinki Design Lab in Finland. By 2012, some of those most receptive to systems thinking and design moved to Open for Business (OFB) which leads Ontario's government-wide burden reduction and service modernization efforts.[149] It was proposed to use design methodologies to advance efforts to cut red tape. However, there was little capacity within the organization itself to pursue these projects. For OFB, the question was whether to build capabilities in-house or support the development of capacity outside of the organization. The forward-thinking leaders of Ontario – senior political staff and senior leaders in government on the deputy minister level – saw that systems change was needed and that the old model of "throwing money at a problem" was no longer appropriate given the complexity of problems in their files and pressure on public budgets. But there was little capacity for transformative change inside government. There was also fear of political interference and that public procurement rules would stand in the way of creating an innovation lab.  Thus, the OFB concluded that as the senior systems and design thought leaders are outside of the government, it would be better to provide seed funding to MaRS Solutions Lab, a public and social innovation lab.[150]

MaRS was able to attract an experienced Director, Joeri van den Steenhoven, to the Solutions Lab from the Netherlands with more than ten years of experience in social innovation and burden reduction in government (Kafka Brigade, Kennisland). During his work in the Netherlands, he began to merge design methodologies systems thinking to be able to understand problems at systemic level whilst developing solutions at the scale of products and services.

MaRS Solutions Lab and OFB began a partnership by looking for particularly difficult policy problems on which they could collaborate. Initially they looked at tricky social policy challenges such as indigenous youth and chronic health. However, these areas proved too complex and politically conflicted for the initial project of a new organization like the MaRS lab. Furthermore, OFB did not have direct ownership over the issues.

Meanwhile, the Lab was in parallel discussions about the challenges that Uber and AirBnB were posing at the municipal level. With the focus of Open for Business on burden reduction in government, reducing regulation and creating an efficient regulatory system that makes the market function creatively, there appeared to be some convergence of opportunities. Thus, in unison the discussion became about how to ensure that new market entrants are playing by the same rules (safety, taxes, consumer confidence etc.). The OFB was also interested in tackling the overregulated taxi industry that struggled to innovate under numerous municipal bylaws and other legacy constraints and saw this as an opportunity to level the playing field. While many of these burdens were not under the authority of the Province, OFB nonetheless decided to back a project lead by MaRS Solutions Lab using a grant program under the auspice of burden reduction. A grant was used to avoid the de facto limitations to innovative approaches imposed by public procurement regulations. The OFB felt in general that the government's old tools were not working and new policy tools were needed. Organizations such as MaRS Solutions Lab could help "fill in the gaps" until procurement

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[148] https://www.marsdd.com/about/story/

[149] https://dr6j45jk9xcmk.cloudfront.net/documents/866/medte-burden-report-en.pdf

[150] https://www.marsdd.com/systems-change/mars-solutions-lab/mars-solutions-lab-overview/

and other barriers to innovation could be lifted.

For MaRS Solutions Lab the makeup of participating project stakeholders was a critical question and only agreed to proceed with the project if the City, as the "owner" of the problem, would be on board with the project. The Lab had learned in previous experiences that without the buy-in from the organizations directly involved inside and outside of government, the work would never gain traction. In the best case, MaRS could function as a neutral convener between public and private sectors and work as glue between the various levels of government that ultimately had some stake in the sharing economy.

283.    Thus, the project started first with the collaboration and funding from the Province and then city officials were approached as "content" partners. As the city of Toronto did not have capacity and expertise in the field of the sharing economy, they were delighted – especially as they did not have to resource the work. As one observer shared, "I think the officials at the City of Toronto had tears in their eyes knowing that someone [MaRS Solutions Lab] was going to come in and help them tackle the issue."

284.    MaRS Solutions Lab represented new innovative capacity for the City who did not have excessive funds to build up policy capacity as quickly as it was required to address an emergent challenge. As one city official concluded, "We have a lot of money, but we don't have a lot of money," meaning that most of their funding was dedicated to the provision of services and operations, leaving very little for internal R&D around policy questions. Furthermore, it was especially helpful that MaRS Solutions Labs could work with different kinds of methods and approaches, because regulators were unclear exactly what the question was that they were trying to answer. They were asked to regulate a dual disruption of both and industry and a policy process. Therefore the City's uncertainty level was very high as is seen in the following reflections by officials:

> If we want numbers, data crunching or confirmation of already known answers, we go to Deloitte, KPMG, etc. but here we didn't want that. This was a question where we didn't know the answer in advance.

> Outsourcing policy is very simple for the City, nothing really new. Outsourcing can help to bring some legitimacy to a process. However, when commissioning KPMG or Deloitte we almost always know what they will say. In this case, the response to a disruption was an opportunity to do some coherent thinking and develop solutions that are credible.

285.    Due to the involvement of the Province and Open for Business, the project had a clear focus: how to make new entrants to the market play by rules while rebalancing regulatory burden on incumbent industries. The taxi industry was perceived to be over-regulated (17-day training course, CPR certification, medical certificate, etc. were required for taxi drivers) and oligopolistic with a core operating framework established decades ago. While the Lab was charged with providing alternative solutions for regulators, their working premise was that they must first determine what the sharing economy could do for Toronto and its citizens, and only then set out to design a regulatory response.

### Initiating a Process of Systems Change

286.    The Lab's work started in earnest in the summer of 2015. Their brief was to understand what the sharing economy could mean for Toronto and design a new regulation that helped the City realize those potential benefits.  This was a significant departure from business as usual. As one person involved shared, "*Usually politicians want regulation – it proves that they are doing something. But sometimes it is not necessary to add requirements to business and citizens.*" Thus, MaRS Solutions Lab needed to make sense of what compliance with regulation within the sector would mean for citizens, Uber, taxi and the City.

287.     Since its inception, MaRS Solutions Lab had been experimenting with their own working methodology which they have since codified in their Periodic Table of Systems Change. Its essential premise is the merger of design thinking together with systems thinking. The periodic table provides a framework for understanding the different kinds of elements required to understand, navigate and intervene in complex systems.  The method acknowledges that for systems to change, it is not enough to tackle policies and provide solutions. To make the process successful, systems thinking needs to also tackle building the capacities of different stakeholders. The figure 24 below illustrates how different stages of systems change – hypotheses, research, testing and marketing – must be considered through the levels of capacity building, solution design and policy making. Working with the system means to cross each layer in the course of different stages of the work process both horizontally and vertically. Each level requires different actions and resources during the design of a systems change process. In the MaRS process, the actions outlined in the table are also combined with ethnographic research that enables the team to understand different user groups and their influence within the system.

**Figure 24. MaRS Solutions Lab Periodic Table of Systems Change**
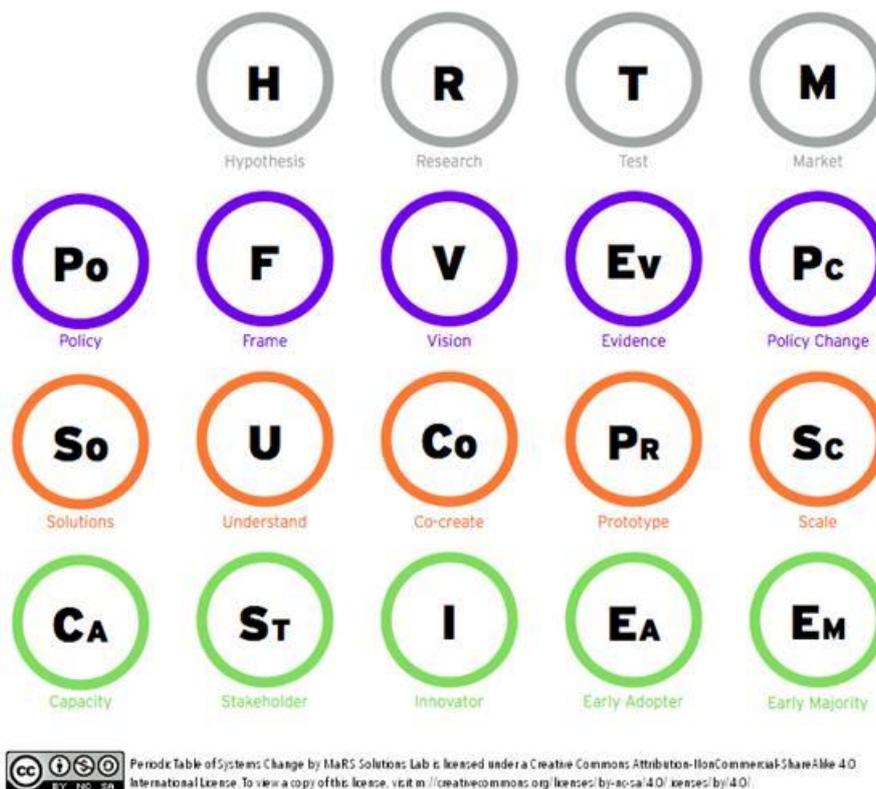


Source: MaRS Solution's Lab Approach 2016.

288.     Having an overall working methodology in place, the initial working plan for the project was made in July 2015.  Desk research followed and public safety and insurance issues were identified as key in both the fields of transportation and accommodation. At the same time, research found that most citizens did not see a substantive difference between services (e.g. taxi versus Uber) as most consumers did not prioritize the same issues that are prioritized by the regulatory regime such as how safety is guaranteed during the service provision. Thus, the main question seemed to be how new technology approximated current provisions and practices by the taxi industry. Uber provides security with technological solutions where taxi companies must use background checks that set a precondition for security and cameras on

dashboards once a driver is on the road. But Uber's model was to employ a digital trail capturing who was in the car, who was driving, where they went and for how long.

289.     To begin to understand the ramifications of this issue, the team set out to establish who the stakeholders were in the system. They found that the final consumers of services were not as informative as the end users of regulation. In other words, it was not citizens, but taxi drivers and hoteliers that provided insight into the system as a whole. The team interviewed sharing economy experts from both the public and private sectors in order to better understand how it worked with and against traditional businesses.

290.     An early discovery was that AirBnB was in totally different market than traditional hoteliers and that the nature and power of hotel-related unions was very different when compared to the taxi industry in Toronto. Within the transportation sector, operating taxi drivers turned out to be in a much more precarious working condition than was commonly understood because garage and plate owners had consolidated more power than the actual drivers.

291.     At the same time, the taxi industry was upset with the City because Uber had been active for two years already prior to launching UberX using their app to push rides to taxi drivers while building up a client base without recourse. After launching UberX, the company changed its operations with the taxi and initiated what was perceived as an anti-taxi campaign with statements such as "the taxi industry is stuck in the 11th century." Thus, the city was seen by taxi as the "cause of the pain", as "willfully neglectful" by delaying action making stakeholders within a fragment industry very distrustful of government involvement. Thus a neutral arbiter was needed to listen to all  stakeholders' point of view and then render a picture of the situation that approximated the reality. As a new, non-governmental actor, MaRS Solutions Lab was perceived to work with a degree of objectivity on a conflicted topic. Seen as a more objective arbiter of the discussion between the taxi industry, Uber and the city, the Lab enjoyed "a different kind of relationship." In designing their research process, the MaRS team worked to balance different interests and combine research with enabling activities that would keep the engagements productive. The Lab tried to curb the violence that had erupted between taxi drivers and Uber drivers and bring taxi association and Uber together and treat the representatives not as organizations, but as individuals.

292.     To understand the sharing economy problem better, MaRS Solutions Lab conducted ethnographic interviews with taxi drivers, Uber drivers as well as stakeholders in the hospitality sector. Solutions Lab team members conducted interviews with drivers from the back seat, informal coffee stands and anywhere they conducted their work. This was a significant procedural departure from a traditional research approach because it bypassed the university ethics boards, etc. that would have been otherwise required. Design research methodologies enabled the Lab to get closer to the problem quickly, without activating the machinery of the academic research community. This work revealed the lived experience of participants in the sharing economy.

293.     Leveraging desk research and ongoing interviews, MaRS Solutions Lab used process mapping to describe the existing regulatory "journeys" of stakeholders and thereby reverse engineered the regulatory system. This proved to be incredibly useful also to public officials (both in the city and the Province) who understood the system in an abstract way, typically biased toward the importance of regulations. This work revealed the substantial burden placed on the taxi industry, the public value of which was not entirely clear. Therefore, the way the debate was framed had to be redefined around core objectives for taxi and the sharing economy.

294.     To "elevate the general level of discussion" and spur stakeholders to speak the same (or at least shared) language, a forum was organized in October 2015, three months after the project launched. Building capacity (like shared language) was understood to be crucial as there was siloed-thinking in

different levels of government and among stakeholders. During the forum, Lab team members used design methods to help participants outline value and network-actor maps for the sector. Interestingly, the maps drawn by government officials were quite consistent and illustrative of departmentalized thinking: civil servants understood what their ministry or unit did (roles and responsibilities), but did not look much beyond the limits of administrative authority. As such, the forum mostly highlighted gaps in knowledge, yet it was useful in helping MaRS identify all the stakeholders connected to the sharing economy and also make necessary connections between civil servants and the private sector. The forum also provided the opportunity for participants to engage in a debate with "intellectual honesty" rather than via combative platforms such as the news media. MaRS' forum facilitated the debate in a different, productive manner. As some participants observed,

> Mars created a safe space for discussion. There was a lot of fear. But they created a kind of proxy for experimentation.

> If the government would have run it, people would have come with the traditional mind-set; venting about the same things.

295.     In the following months – November and December – the research team delved further into the perspectives and issues of stakeholders by continuing interviews, one-to-one meetings and early suggestions for possible solutions. Meetings with policy makers, regulators, companies and associations helped both to inform the Lab's understanding of the problem and to create buy-in and credibility for the three focused workshops that would follow.

296.     In the end of January, the first one-day workshop was held on the sharing economy as a whole. MaRS Solutions Lab brought in international experience on the sharing economy to share different models (e.g., Amsterdam) to the stakeholders. Within the workshop, MaRS used different mapping and creative exercises to help people to think projectively about what Toronto's future could be and what Toronto´s overall development goals should be, especially in regard to the sharing economy. For example, the Hill Valley Telegraph exercise, where the participants can imagine what would be in the front page of a newspaper in the future, was designed to be a forward-looking task to think about innovation within the city.

297.     The second workshop focused on transportation and was held in the beginning of February 2016. Three levels of government – city, province and the federal – were present. For the workshop, Licensing, insurance, taxation, public safety were identified by MaRS Solutions Lab as the main issues that regulation would likely need to address – the workshop was designed in part to validate their research. Mapping exercises highlighted the findings of the desk research and interviews that suggested that the there was heavy regulatory burden on taxi drivers, while the emerging car-sharing industry was struggling with an insurance product gap (liability insurance specific to part-time working model of Uber drivers), an issue that the Province had been working on in parallel.

298.     In the course of the seminar, the MaRS team presented carefully mapped the regulatory journeys of taxi drivers (Figure 25) and used personas and quotes from interviews of taxi *and* Uber drivers to illustrate their "lived experience." One of the most powerful quotes came from a taxi driver comparing his struggles with the city administration to that of the Urban drivers: "*I want them to feel my pain.*" This had the effect of joining together the realities of both sides of the debate. The Lab also shared international experience on regulation (e.g., Portland, Oregon and other cities) to highlight different potential futures for Toronto. A third, similar workshop was also held on accommodation later in February with similar exercises, journey maps (Figure 26), etc., but due to the intensity of conflict being lower in the sector, the focus of attention was clearly on transportation. Interestingly, nothing substantially new emerged from the workshops for the research team. But a common language around the problem was developing among

stakeholders. However, the regulatory journeys were surprising to many and a new insight public officials had not considered about before.

**Figure 25. Regulatory Journeys of Taxi Drivers**
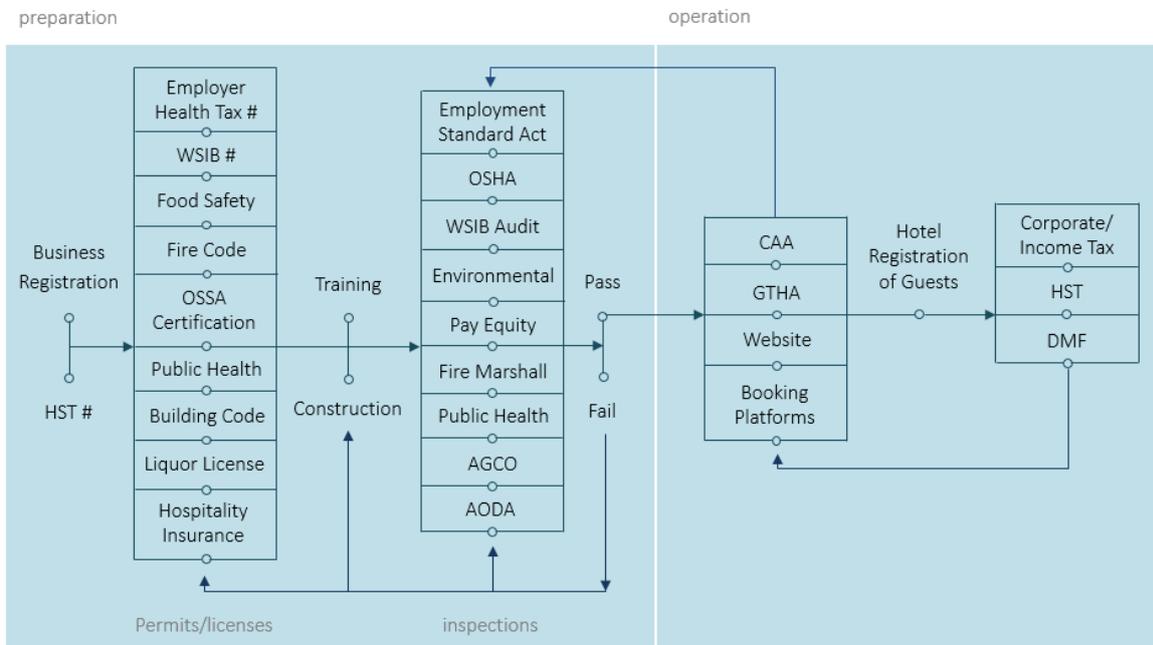


Source: Van den Steenhoven2016a.

**Figure 26. Hotelier Regulatory Journey**
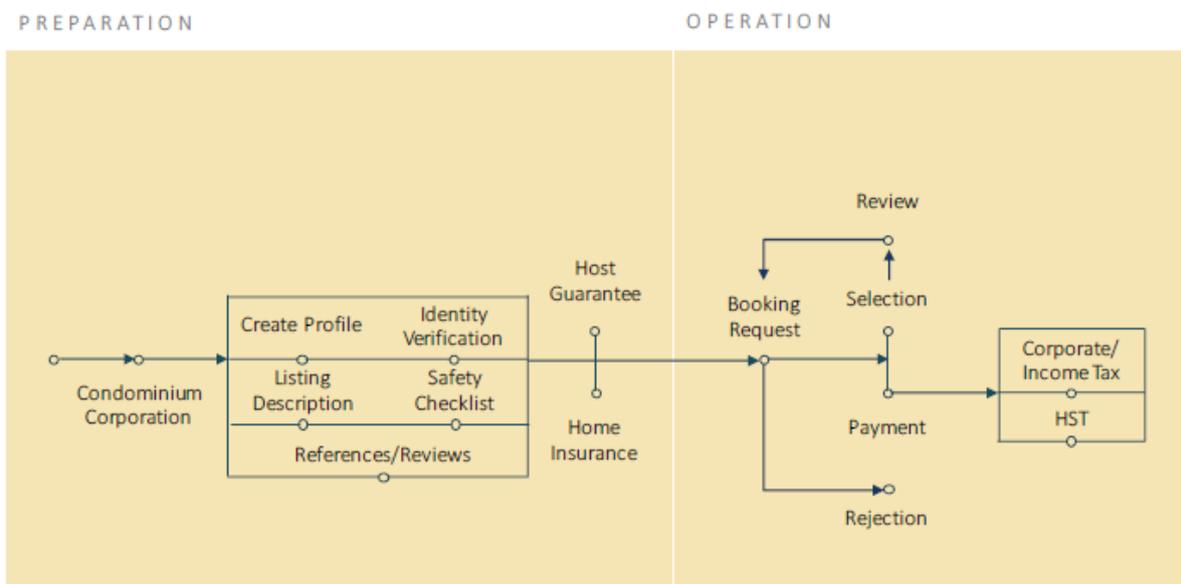


Source: Van den Steenhoven2016 b.

299.    Consequently, MaRS Solutions Lab helped to identify the issues that would later help them propose simpler solutions using plain language, focusing on public value and utilizing the appropriate level of regulation. The unification of language with which to talk about the problem was seen as the major benefit of the process: "MaRS took the concept to the next level." Furthermore, by facilitating an open, transparent process MaRS was able to break the barriers between different silos, interests and organizations which made the process much faster than usual.

300.    In parallel to the workshops, one-on-one interviews with experts and the main stakeholders continued. This helped to build relationships, but also validate solutions the Lab was working on and answer questions such as: would it work? Could it work this way? This also helped to build capacity and assign ownership over the issue. The early months of 2016 were especially important for the communication between the city of Toronto, Municipal Licensing & Standards Division and MaRS Solutions Lab; the Lab and the city needed to sequence their activities in order to influence the system effectively.

301.    During the MaRS process, the city had started their own additional consultation with stakeholders. As one official said, "With Uber, the devil is in the details." This became the focal point for the regulators: for six months the Municipal Licensing & Standards Division transformed into a so-called "Uber bunker." While the city officials were compiling their own staff report on car-sharing and the taxi industry for the city council, they saw value in the connections and discussions MaRS Solutions Lab facilitated: "On our own we are isolated, what gave us a leg up was going out from our sphere." Working together the Lab and the city assured that their reports and understanding of the issue were in a degree of alignment.  In parallel the city also had to work together with the Province to assure that a viable insurance option for Uber drivers existed by the time regulation was passed in the city of Toronto. For this, the Ontario Ministry of Finance can design the framework for a new insurance model, but in the end there has to be a private insurance company to offer the insurance product that meets the government's objectives. One problem was that the insurance companies did not understand where the risks were in the ride-sharing business. Nevertheless, the Province was afforded insight into the topic and contacts to key stakeholders via the MaRS Solutions Lab workshops and thus was able to develop a solution quickly. By February 2016, an insurance company was able to offer a new product, enabling the city and Province to move forward with regulation.

302.    MaRS Solutions Lab released their final report on regulation and the sharing economy at the end of the March. Ten days later the staff report of the City of Toronto was also released. MaRS' report was easily "digestible" and pragmatic in offering practical, balanced recommendations. The timing of the release of the MaRS report was considered one of the most important factors of its impact. Nevertheless, the report sets the stage for the taxi industry and car-sharing regulatory decisions made by the City Council. It succeeds by portraying a balanced approach, while at the same time creating a "correct political frame" that enables a productive discussion about the 'right' things: legalizing the sharing economy, meaningful solutions and a level playing field.

303.    By releasing their report first, the MaRS Solutions Lab's takes some of the heat from the media, opens the topic in newspapers and gives some room to breathe for the City to make their recommendations. Further, the report is widely perceived to represent the citizens' interests. But, neither Uber nor the taxi industry is totally satisfied, although neither argue directly against the report. Many issues are left open-ended in the report (for example labor issues are not discussed at all), so the "level playing field" can be interpreted it in many ways.

304.    In April, the staff report goes through committee, but is cut down and significantly changed by the City Council. For many stakeholders, the political process is unpredictable and thus, disconcerting. Many politicians in the City Council have been in their positions since 1998 when the owner-operated taxi

model was voted into place and thus they were stewards of the last model and resist changes. Some city officials were therefore defending the existing regulatory regime, at points becoming a very personal process citing "Uber silver" in their hair by the end of the public debate. Nevertheless, new car-sharing and taxi regulation was voted on in the City Council in July 2016.

305. Thus, the Mayor's political support in the council becomes essential. He takes it up personally to put back parts of the regulation on the council floor and makes it his key political issue. While the Mayor has only has one vote on the floor – there are no significant partisan coalitions in Toronto – he has political clout and ultimately helps a substantive regulation pass. For one observer, "if the city would not have adopted the regulation then the technology sector in the Toronto-Waterloo region would have looked stupid." This hints at a certain "innovation bias" of the MaRS Solution Lab.[151]

306. In the end, the council passed a ride-sharing regulation mandating that to drive with Uber in the City of Toronto, drivers must hold a Private Transportation Company (PTC) license that can be obtained from the city through the company. Uber drivers must comply with the technical requirements for their vehicles (e.g., vehicles can be no older than seven model years) and hold $2 million in liability insurance and provide proof to the city. Once a year the drivers submit to a background screening concerning driving history and criminal record. Taxis also got the right to charge surge pricing, if rides are booked through a smartphone app.

*Impact and Effects*

307. There are winners and losers from every process. Uber was likely the biggest winner by gaining first of its kind, friendly regulation in Toronto, which will surely influence the rest of Canada.

308. Taxi medallion owners lost the most: the value of the taxi medallion dropped from 300 000 dollars to 50 000 dollars although it is hard to discern how much of that drop in value was due to the regulation. Some argue that the taxi drivers perception was that they "bought from the city a full-time job with no cost to the city; taxi drivers paid for the privilege." Ultimately, there was little change for taxi drivers. However, the 17-day training program was scrapped and the meters are no longer inspected by the city, but the meter fee from the city remains and furthermore, licensing remains, which means more documentation than Uber drivers. For them, "a level playing field never really happened."

309. There are still many areas where a solution was not researched – taxation and labor relations being at the forefront of concerns. Taxi drivers are afraid that they are at risk of losing avenues to retirement. Also, the long-term socio-economic effects from factors such as the increase of precarious work are unclear. These issues are very complex and include impact to economic development and increasing inequality, which has yet to be evaluated. Furthermore, there are new challenges in the field such as autonomous vehicles, making regulators ask if the topic of Uber and taxi drivers will not be redundant in a couple of years. Regulators are afraid to lock themselves into subpar solutions early on, but they also risk to miss the potential to influence the new industry.

310. Although the taxi industry had a chance to be heard through the process facilitated by MaRS, they seem to have lost trust in government through the process. While Uber branded itself initially (prior to releasing Uber X) as a technology company, the same type of service providers in the taxi industry, were regulated as taxi companies by the city. As one member of the taxi industry said, "it left a bad taste in my

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[151] While generally seen as an objective/outside arbiter, due to its connection to the MaRS Discovery District, an urban innovation hub, for some of the interviewed stakeholders it is not surprising that the Lab reached a sharing economy friendly solution. MaRS Solution Lab itself sources credibility from the fact that it's an innovation hub, personal relationships it creates with stakeholders and simply "*hard work*."

mouth; we felt foolish that we followed the law." Nevertheless, taxi lobby has quieted and there are no more protests or violence.

311.     Many questions remain unanswered. There was hope that Uber will solve the first mile, last mile problem (i.e., comfortable distance from a fixed route transportation stop) and this remains to be seen. Does it really reduce congestion in the city? One would think that the use of car-sharing would have an effect, but also without Uber there would not be cars drive around that otherwise would not have been driven, less people use public transportation, cars come in from other areas to the city to drive for Uber which creates discussion around tolling highways. Furthermore, is it a fair playing field if Uber drivers do not declare taxes? Taxes are an ongoing issue at the federal level. There are a lot of unknowns and the government does not have relevant data from Uber (they argue they are protecting their business model). AirBnB, by nature of its platform is more controllable as has been demonstrated in many cities. Taxation is one of the most complex issues: "it takes a level of heroism to run with such an issue inside government." Nevertheless, US cities (e.g., Washington DC with AirBnB) are making progress also on the taxation side and creating an example for the rest of the world.

312.     The more time that goes by, the more the MaRS Solutions Lab report on sharing economy will lose utility. However, on a larger scale, its impacts are likely to be felt. The more municipalities legalize sharing economy businesses, a critical mass will emerge, bringing forth a domino effect. This had been realized already as: "Municipalities are phoning in to Toronto and asking: what did you do?"

313.     However, have the regulators really taken a proactive stance through this process with MaRS Solutions Lab? Maybe, but time will tell. The city is experiencing what was described as "Uber hangover," thus, the work on the regulation on the accommodation sector is going at a lesser pace. The Province and the federal government are still struggling with the effects of silos. Thus, the systemic effects can be found more outside the government rather than inside. However, more and more similar horizontal cross-cutting issues are entering the public domain in Canada: FinTech issues, automated vehicles, marijuana legislation. The need for organizations like MaRS Solutions Lab is evident.

314.     The 'black box' approach to policy making is changing and more consensus-based discussions are demanded (using third party arbiters in public engagement processes, first define what the problem is, then working through propositions in an open and transparent process. As described by one of the interviewees: "Problems cannot be too small, nor too big – boil the ocean – for these kinds of processes. They have to be middle scope." If there is a long implementation process, one must ask "will it be useful to know these people two years down the line and teach them the same vocabulary, so, they can talk and understand each other." At the same time, governments are still struggling to find the "luxury of time" for these multi-day processes, while a broad range of competing interests demanding attention at the table.

**CONCLUSIONS**

315.    The following section is divided in two parts. The first provides an overview of the main conclusions drawn from the case studies and how they tie back with the analytical framework presented in the report. The second discusses the remaining challenges and opportunities of introducing systems approaches in the public sector. It also distills advice to policy-makers on when and how to use system approaches, and what level of understanding is required to drive successful system transformation processes.

**Lessons from the case studies: results of testing the application of the systems transformation framework**

316.    While system transformation evolves differently depending on time and contextual factors, it is often triggered by the "perception" of a crisis. This might be an actual crisis, but it may also be an understanding that the outcomes current systems produce are not acceptable any more. It also means that someone needs to take direct ownership of the problem set.

317.    All examined case studies showed that some level of this urgency (Uber X opening business, drastically worsening situations, audits, evaluation reports etc.) is needed to initiate the process; this creates a 'window of opportunity', but does not guarantee success. Would have there been a social or fiscal crisis in Iceland, if they would not have started their domestic violence project – probably not. However, if one starts to acknowledge the severity of cumulative effects, a sense of urgency – crisis – emerges. While federal government was working on the issue of sharing economy in Canada, there was no impending "crisis" knocking at their door (similar to UberX in Toronto), no direct incentive for government to move forward quickly. The case from the Netherlands indicated that during truly chaotic moments in organizations it is difficult to start change processes – some level of stability has to be reached to apply a broader systems approach. Hence, first the fiscal situation of the organization was dealt with, and then a more concerted effort into systems change was put in motion. However, even in a stable environment a sense of urgency needs to stay with the stakeholders involved. This is part of how to change systems also in more static conditions. At the highest level people need to acknowledge that public services and broader systems do not fulfil their intended purpose.

318.    While understanding that there is a problem is the first step – even if not knowing what exactly it is about –, it is not enough. This knowledge has to become actionable. The report identified several tactics – people & place, dwelling, connecting, framing, designing, prototyping, stewarding, evaluating – as important elements of systems change. However, each wicked problem is essentially unique which prohibits many 1:1 comparisons between systems tactics. The conduced case studies presented a variety of conditions and contexts, political interests and involved actors. Consequently, they showed different mixtures of systems tactics to be especially important, while all were present in some way in the case studies.

319.    First and foremost, **the *people and place* are essential drivers of a change process**. This does not only pertain to leadership capabilities – although, all cases showed excellent characteristics to that regard –, but the fact that there is a supporting team behind the change, a critical mass of people that believe that change is necessary and who have internalized the "crisis." Think of the "Three Amigos" leadership structure in Iceland or the concerted effort of the director's board in the Netherlands. Having the "right people" around the table to discuss complex issues, outline processes, take ownership is key to the success of systems change. When it comes to the *place* of change, it was surprising that all cases established some kind of an "objective place" to debate the need for change. In all cases, some way or

another, an objective arbiter for the discussion was present. Who has the legitimacy to say that things are not proceeding the right way at the moment? Government bodies have sometimes too long track records with outside stakeholders to inspire trust in a fair and unbiased process. Thus, in Canada a fairly new lab carried out the analysis and facilitated the conversations, in Finland also an outside-government party (Demos Helsinki) took the brunt of the discussions. In Iceland moving from the pilot phase (Suðurnes) to the metropolitan area, a steering committee for domestic violence was established in Reykjavik's Office of Human Rights – the office was not involved in the services directly and thus, could bring the discussions to a neutral ground. In the Netherlands, the systems consultant acted the part, but a group within the organization (and nor of leadership) was created, who became the "tour mangers" of the change process. This is especially needed as each case had a strong value debate connected to it.

320. As such, **after internalizing "crises," organizations need to create room for *dwelling* – investing the time to understand and articulate both the problem and the objectives**. In the case of the Netherlands, this meant long discussions intra-organization and the identification of a new mission: "Every Child Safe, Forever." The organization understood that they need to focus on children's safety and start treating adults as parents first and individuals second. In the case of Iceland, broader community discussions with the police, social services, child protection, church etc., were initiated. It cemented that domestic violence is a public health issue and not a private matter; thus, prioritizing the social effects of violence over privacy. In Canada the value debate was designed to be part of the dwelling process utilizing different mapping exercises. It was clear that more flexible, affordable transportation system was preferred over other concerns. The Finnish case in this regard is most complex: as the initial conversations were about the method, the discussion was mostly on the meta-level surrounding the disconnect in the policy making system and the lack of direct feedback from implementation to policy design. Thus, the positive and negative side of experimentation emerge in practice.

321. **It is important to involve all important parties at this stage and take them through the same learning journey**. Otherwise, it is difficult to explain to *de facto* outsiders why a new approach is needed. This was evident both in the Dutch and the Icelandic case: when the child protection organization in Amsterdam started to explain their approach after the fact to a broader network of connected service providers, it was quite a difficult process. In the Icelandic case a small community project was taken to the metropolitan area by transferring the key people from one place to another – this created a lot of resistance in a bigger organization presented with a ready-made solution from somewhere else. ***Time* is an essential resource in systems change because people need to live through and experience the change rather than be told about it by a third party**. This makes systems change far from easy: established structures are resistant to change. While the change process can come with an individual sacrifice to those involved in the process (e.g., Toronto city official reported to have "Uber silver" in their hair), after changes have institutionalized, it becomes difficult to turn back the clock completely. This is certainly the case in Iceland and also the hope in Finland regarding the experimental policy design program.

322. To re-examine the purpose of public sector systems and problems connected to them, time and other resources are needed. Usually only high level leaders within organizations are able to create this space. Thus, ***stewardship* of systems change is needed from the get go**. All cases showed that systems change needs resources both outside and inside of government. The strategic planning and procurement systems in the public sector do not fit this kind of work. Thus, specific financing measures had to be found both in Finland and Canada to support the work. In the case of the Netherlands a substantial part of the money had to be collected outside of the organization. Standard tenders are ineffective here as systems change requires a definition of a mission/focus and then iterative development towards the focus, not long-term visions and defined actions. While the domestic violence project in Iceland was initially carried out without additional resources, this meant that police had to prioritize some tasks over others and thus, create time for change. With high workloads and heavy burden on the system, this is not sustainable in the long run. In other cases initiating systems change meant a direct investment from the side of the government.

323.    **As the process of *dwelling* essentially initiates a debate around how to define public value within the system, *connecting* to different parts of the system becomes essential**. This is not only important in terms of who is involved in the process, but how it is facilitated – tools, methods etc. – to create a common understanding around complex problems. *Design* approaches are often used as an enabling mechanism for this work. MaRS Solutions Labs created personas for taxi drivers and Uber drivers and visualized regulatory journeys of each to make it easily relatable to all stakeholders. By involving all parties in the process a common language around the problem emerged which helped to structure the following debate. The same can be seen in the Finnish case, where Demos Helsinki connected to variety of stakeholders – "godparents of experimentation"– to advance the concept of experimentation in Finland. This also creates ownership over issues discussed. In the Suðurnes project in Iceland all the stakeholders were very close together in a small community anyway (while not yet working together towards a common goal), while *connecting* became essential when scaling up the project. The Dutch case, as argued before, showed to some degree the dangers of not connecting to the broader system from the get go.

324.    **To focus the discussion on the change required, *framing* of the debate is needed**. Problem frames link the desired outcome with a definition of how a solution might be organized. This is especially important when it comes to political debate where the past experience and ideology of stakeholders may affect participants understanding of complex problems and their causes. Thus, framing the debate in a constructive manner concentrating on the next steps becomes essential. In Canada, the political process in the sharing economy regulation journey was uncontrollable – even if all steps were taken to prepare the public discussion – and it took a political leader to bring back the discussion to the topic. In the Finnish basic income case the political debate has been somewhat unfocused – different narratives of the nature of future work, welfare traps and social participation are brought into the debate – and the discussion has maybe focused too narrowly on specific issues. This in the future might affect the whole experimental policy design program. In the Dutch case the process was somewhat sheltered from outside interference, but through the mission towards keeping children safe very concretely framed inside to organization to keep the focus on the change needed. In Iceland, the whole public debate had to be slowly remodeled to look at domestic violence differently. As such, framing wicked problems is important as many competing topics can eclipse the urgency of change. Nevertheless, as also mentioned above, this is a process that is very difficult to control and filled with uncertainty. Consequently, it is essential to connect the right people in time to start developing the same language when talking about a problem.

325.    **However, when the unknowns are very high then additional information has to be created to make decisions more manageable**. Thus, in situations of uncertainty additional steps to test solutions have to be taken. This is what described in the report as *prototyping*. Closely linked with *design* of systems change, it revolves around the feedback loop between ideas held and actions taken. While the Finnish case in terms of the process was about how to introduce new working methods to government, the underlying momentum was to create an iterative government which helps to be more adaptive and resilient when faced with uncertainty and complex policy problems. By creating new knowledge from experimentation, different processes can be designed. In a small community in Iceland this took the format of "learning by doing" as feedback loops between implementers and policy designers were short or even non-existent. However, in broader contexts, testing solutions in situations where outcomes are unclear, has to be specifically kept in mind, also because feedback loops are usually not that short. Hence, how to know if the system and its change is actually producing the desired effect?

326.    **When it comes to complex problems a *meaningful measurement* is key given causality is usually a hindsight and the effect of interventions are very difficult to assess**. In the Netherlands this meant a specific measure to *evaluate* child safety – "acute child safety" – and in Iceland a new risk framework was adopted. At the same time, the lack of concrete, numerical measures from the outset will probably change the direction of the experimental policy design program in Finland. In the Canadian case, the whole process was to create a legitimate evaluation for impetus to change. Consequently, *evaluation –*

as part of the systems tactics presented in the report – it is not only needed for reporting back on the impact, but it becomes a communication device that legitimizes the process of systems change and the use of systems approaches themselves. The evaluation carried out by the Institute for Gender, Equality and Difference at the University of Iceland regarding the domestic violence case, helped to keep the process going. MaRS Solutions Lab's evaluation plus additional federal and nongovernmental reports paved the rode for the city of Toronto to push the sharing agenda forward.

327.	In addition to previously outlined tactics some other factors emerged. Contextual factors are essential for systems change. For systems change timing is everything and supporting elements have to come together to create a "window of opportunity." Throughout the cases the idea that "*timing* is everything" emerged. Furthermore, different resources are needed for systems change – time, finances, capabilities and legitimacy – which also means top-notch leadership and stability in political support; but leadership alone is not sufficient. Based on the case studies, it is difficult to say which factors were the most influential, but it is clear that different elements have to be in place to make change possible. Moreover, systems change is a continuous process: there needs to be feedback from unintended consequences and unforeseen conditions during the implementation phase and beyond. As the case studies showed, after reforming one part of the system, other ineffective parts become more visible.

**Challenges and opportunities in the public sector**

328.	In the previous section the many reasons why systems approaches can be an arduous albeit awarding process have been outlied. More so in the public sector where organizational learning is challenging due to input-output evaluation systems, path dependencies and the need to coordinate action between various governance levels. Traditionally governments were designed for stability, reliability and predictability and it is not surprising that there is a resistance to change. Nevertheless, many systems in the public sector need to transform to respond to 21st Century challenges.

*When should public policy makers use systems approaches?*

329.	Systems thinking is not panacea for all ills. Neither is design. Systems approaches in general are very time- and resource-intensive, especially when used to transform the functioning of a policy system in practice. Hence, policy makers should make careful considerations before initiating these processes if they are indeed willing to implement large scale changes within policy systems. Otherwise the exercise would be largely wasted.

330.	However, with many wicked problems characterizing our policy space it is clear that there is a miss-match between organizational structures and problem structures. For example, if it is clear that the care system does not fulfil the needs of the aging population, while there are less people who can provide the service to begin with, then systems approaches can be a good approach. Furthermore, in cases where traditional specialization of tasks or sector in the government apparatus does not respond to the challenges any more, systems approaches can be helpful. As such, possible policy areas that could benefit from a systems approach involving transboundary policy challenges include climate change, internal security, immigration and integration, policing, education, health care system etc.

331.	While in some cases policy makers face imminent problems that they need to respond to - e.g. as is the case with the refugee crisis -; in other cases, the problems are known, but the effects are more far removed, remote - as is the case with climate change. Consequently, public pressure for policy change can be also considerably different. Invariably in crisis situations the window of opportunity is open wider and there is more room to change, start over and dramatically reconfigure public service delivery; however, in most other cases change initiatives have to contend with resistance from established institutions, protocols. In more static conditions some level of backing from high level leadership is needed to legitimize change

processes and create the authority to work against both internal and external resistance to change. Consequently, the need to legitimize systems level reform can vary from situation to situation.

332.     There are several questions public policy makers need to analyze before attempting systems transformation:

- How complex problems need to be addressed?

- Is the uncertainty connected to the process high?

- Where does the legitimacy for policy reform come from?

- How much time is there to implement chances?

- Is there high-level backing to implement systems change?

- Does the potential systems level change cross different governance levels?

- Are the stakeholders open to change and cooperation in the process?

333.     If policy makers are dealing with complex problems, with high levels of uncertainty and they have legitimacy and backing to implement a significant reform, then a systems approach is appropriate.

### *How much should public managers and civil servants know about systems approaches?*

334.     Usually systems approaches in the public sector are expert led: the existing processes are analyzed and a new system is worked out with teams of specialists (systems thinkers, designers etc.), but they usually do not participate in the implementation of systemic change nor in the long-term learning process within organizations. Hence, also public sector managers and administrators have to know about systems connected to their policy areas to continue the learning process. There, however, is a difference in being systems aware and systems specialist. The report does not suggests that all public managers and civil servants should become systems thinking specialists; rather it is important for different public policy experts and managers to be aware of these approaches.

335.     In general, *public managers* working with complex problems should have a general understanding of the systems they are working with. For reflexivity in their policy field general knowledge about working with complex systems is beneficial: one needs to be aware about complex processes - for example links within the system and the possibility of unintended consequences - to be able to identify and work on them. Furthermore, this helps to work with relative precision, make decisions under high levels of uncertainty; understand the limits of intervention and importance of experimentation. Public managers are usually the ones that can start changing organizational processes to build up open ended approaches, thus, some knowledge of the potential and value of systems thinking is needed.

*336.     Policy experts* within specific fields should have more precise knowledge on how their policy systems work, who are the stakeholders and what are possible the causal relationships within the system. Even if this can never be precise, it is needed to understand the problems practitioners are working with and build up open ended practices to gain useful feedback. In attempting systems change they are the ones working on the details: putting together teams to analyze processes, procuring for help from outside the public sector. That is why, knowledge about the usefulness and limits of different systems approaches can be highly necessary. Do policy makers need help in simulating effects in an overabundance of data or more

profound, objective perspective in outlining the interdependencies within a policy system? Systems approaches and tools can considerably differ in these circumstances.

*337.* *Street level bureaucrats* have an important role in systems change. They are closest to the end users, their needs and the effects. Consequently, they are the ones with the firsthand knowledge of how a specific arm of the system is functioning, while they might not have the full picture of the functioning itself. However, they should be included in the open ended processes systems approaches require, because they are usually the first to spot unintended consequences and pass on the feedback to the policy makers. However to do so, they need to be aware of the overall goals of the systems. Hence, they have to be systems aware, especially in terms of the functions systems are fulfilling.

338.     The above does not signify that different groups of practitioners would not be involved in a more profound systems reform. Creating awareness of systems failures and shortcomings is needed in all levels from a public manager to a street level bureaucrat to create a fertile ground for change.

### How should public managers use systems approaches in the public sector?

339.     As outlined above there are various systems approaches that have more or less rigid methodologies. The report does not promote a single, specific systems approach - the selection of the method and specific tools connected to the aforementioned depends on contextual elements and policy problem in question. This point cannot be emphasized enough: the systems and design tools used will have their greatest effect when they are selected specifically to address the context, the problem, the timeline and the capacity of the organizations involved.

340.     So how will a public manager know that a systems approach might be appropriate? The first indicator will be that their current tools and logics that underpin the design of those tools are no longer able to meet expectations, or are making the problem worse. The exhaustion of traditional problem solving approaches suggests that systems dynamics have changed the underlying architecture of the problem itself. New analytical tools and problem solving methods will be needed. Another indicator might be that the problem in question cannot be solved under the sole authority of the administrative body or even within the whole of government. A second order indicator could be the demand from citizens to have a voice and role in the work of the administration where none had existed (or was treated as tangential) before. Finally, any problem set that cannot be addressed via a large or small scale single initiative either because of cost and time constraints, or difficulty in building sufficient constituencies, or because of the complexity of the problem itself will benefit from systems and design methodologies.

341.     So you have a systems problem. Now what? There are likely two immediate action items that can be taken. First, think about who can help you understand the systems problem and how. This will likely require external expertise, but you will undoubtedly find allies internally who have been down this path before and can speak to resourcing, procurement, buy-in and other issues with specificity to your context. For external expertise, it is recommended you look to designers and others with some public sector experience as the motives that drive decision making is very different in a public service context than say, product design. A good place to start are think tanks that are working on innovation in virtually any context.

342.     Also, you, as a manager, will probably need to provide some training opportunities for both you and your staff. This does not have to be a large, formal professional development scheme. It can start small, but the objective is to begin to socialize ideas about systems and complexity, and new ways of working with a new type of problems. For instance, you could invite a speaker to come in and share some insight into wicked problems and how they can be approached. Socialization will set a foundation for

further exploration through formal training that will help enable everyone to feel some ownership, and most importantly, have a role to play in a changing administration.

343.     Again, greater specificity will be highly dependent on the context, institutional capacity, problem, timeframe and resources available to public administrations as they embark on systems change. However, the report highlighted strategic principles in systems approaches that in our perspective are essential to systems transformation success.

**ANNEX 1: DEFINITIONS**

**Ashby Space**: the relationship between variety of stimuli and variety of response (or in organizational terms, external complexity and internal complexity. When stimuli and response are in balance, this is called *requisite variety*.[152]

**Complex adaptive system**: a system involving often human activities and dynamics that make it continuously emergent and with only limited predictability.

**Complexity gap**: mismatch between the increased complexity and uncertainty of the world on the one hand and the established governance arrangements and institutions of the society on the other.

**Intervention**: small scale discrete or coordinated actions that can transform larger systems.

**Linear causation**: an understanding of each cause as the effect of a previous cause.

**Soft Systems Methodology**: a methodology used to support and to structure thinking about, and intervention in, complex organizational problems.[153]

**Stewardship**: the art of aligning decisions with impact when many minds are involved in making a plan, and many hands in enacting it.[154]

**System**: elements joined together by dynamics that produce an effect, create a whole or influence other elements and systems. Systems exist on a spectrum of comprehensibility: from easily observed and analyzed to highly complex or novel requiring postulation. A system is always more than the sum of its parts.

**VUCA**: an acronym for Volatility, Uncertainty, Complexity, and Ambiguity that describes the general state of global affairs today. The term was coined by the US Army War College to describe the fallout left by the end of the Cold War.

**Window of opportunity**: when separate streams of problems, policies, and politics come together at certain critical times, then solutions become joined to problems, and both of them are joined to favorable political forces.[155]

**Window of viability**: a balance between diversity and efficiency. Too much efficiency can lead to brittleness whereas too much diversity can lead to stagnation.

**Wicked Problems**: complex challenges where conflicting interests and priorities, and incomplete and contradictory information make establishing shared facts and understanding difficult.

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[152] Boisot and McKelvey 2011.
[153] http://www.learnaboutor.co.uk/strategicProblems/m_s_3frs.htm
[154] http://www.helsinkidesignlab.org/legiblepractises/
[155] Kingdon 1995.

**ANNEX 2: A BRIEF HISTORY OF SYSTEMS APPROACHES**

344.     Complex problems are not new and the effort to simplify in order to make these problems 'manageable' has long been on the agenda of both policy makers and academics and especially systems thinkers. While there are general streams of systems thinking (general systems theory, cybernetics, systems dynamics, etc.), there are thousands of different streams of 'systems thought' with hundreds of different methods and techniques. Today, many policy studies have moved to apply methodological pluralism (choosing the method(s) based on the problem at hand)[156] when applying systems approaches. But it is important to understand the background of different approaches before applying or insourcing analyses. No method is perfect and systems thinking and other similar methodologies should be seen as one of the many tools available for governments.

345.     Systems approaches have been around for more than 80 years—since the 1930s.[157] They are rooted in the works of von Bertalanffy and his General Systems Theory[158] and Boulding's contribution on hierarchical complexity.[159] These strands largely originated from biological and ecological studies. During the Second World War, systems research was pushed forward by engineering studies: operations research leading to the emergence of cybernetics and control theory[160] and systems engineering.[161]

346.     Cybernetics is a study that concerns itself with the flow of information through a system and how this information is used by the system to control itself.[162] One of the cornerstones of organizational cybernetics is the Ashby theorem on requisite variety (complexity).[163] The theorem states that simplifying complex problems does not bring us closer to workable solutions—complex problems usually also require complex action. Thus, public managers must have access to a variety of actions similar to the variety of circumstances they wish to control.

347.     As such, cybernetics introduced several new themes to the debate: for example, the relationship between the peripherality (autonomy) versus centrality (control) of actors within organizations, importance of variety and participative management. Cybernetics asks where new ideas can grow within an organization and what kind of autonomy is needed for the former. Consequently, it is most useful as *diagnostic and design tool for development and viability of organizations*.[164]

348.     In parallel, the surge after World War II in computing power made it possible to model larger systems with quantitative computer models leading to the formal study of '*system dynamics*'.[165] This created the momentum to mainly utilize quantitative modelling to describe complex interactions and feedback in systems.

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[156] https://johnpostill.com/2012/10/31/methodological-pluralism/

[157] See e.g., Jackson 2009.

[158] See historical overview in von Bertalanffy 1972.

[159] Boulding 1956.

[160] E.g., Ashby 1956; Wiener 1948; Bateson 1972; also Beer 1979.

[161] Hall 1962.

[162] Mingers and White 2010.

[163] "Only variety can destroy variety" Ashby 1956. This means that actors have to balance their own complexity/variety with the contextual/situational complexity/variety. This can be achieved by simplifying external variety or amplifying actors own variety or both at the same time.

[164] Schwaninger 2004, 414.

[165] Forrester 1961; 1968.

349.     The early system dynamics proponents believed that some generic feedback structures can be described and modelled.[166] This has also carried over into Peter Senge's work on learning organizations— *The Fifth Discipline*[167]—and systems' archetypes that are proposed to explain many organizational problems. This work is also echoed by Donella Meadows and her 'leverage points' and the twelve places to intervene in a system—see Figures 28 and 29 below.[168] These approaches simplify the analytical process to a degree, make it easier to use, but also come at a cost: concentrating on theoretical expectations of problems—archetypical situations—true causes of problems may be missed. Nevertheless, this simplification allows systems dynamics to identify various causal loops within the system and test the former in computer models, simulations. When there is a lot of data to make sense of this can be a justifiable approach (see example in Box 10).

**Figure 27.  Meadow's Leverage Points**
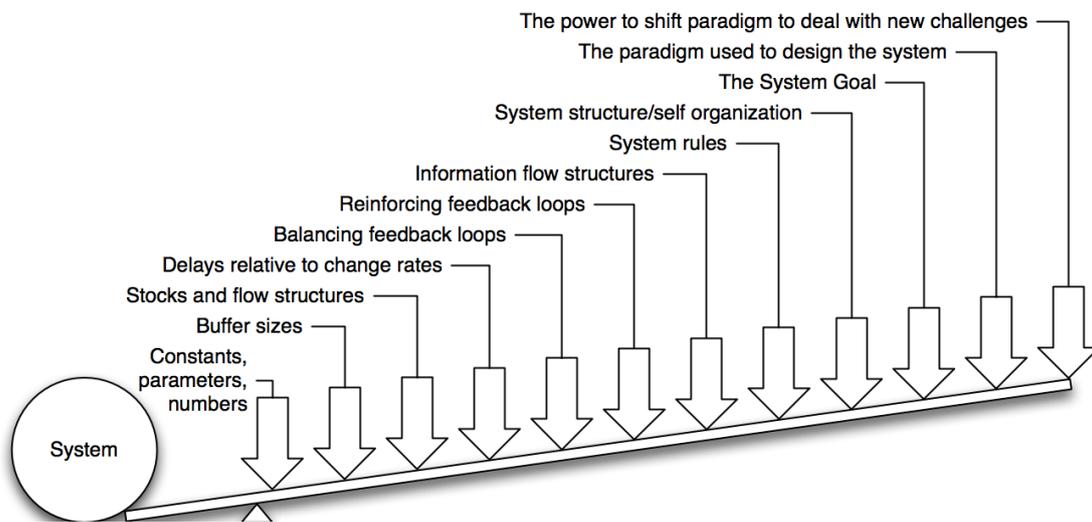


Source: Based on Meadows 1999.

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[166] Forrester 1969.
[167] Senge 1990.
[168] Meadows 2008, 3.

**Figure 28.  Les Robinson's Adaptation of Meadows Leverage Points**
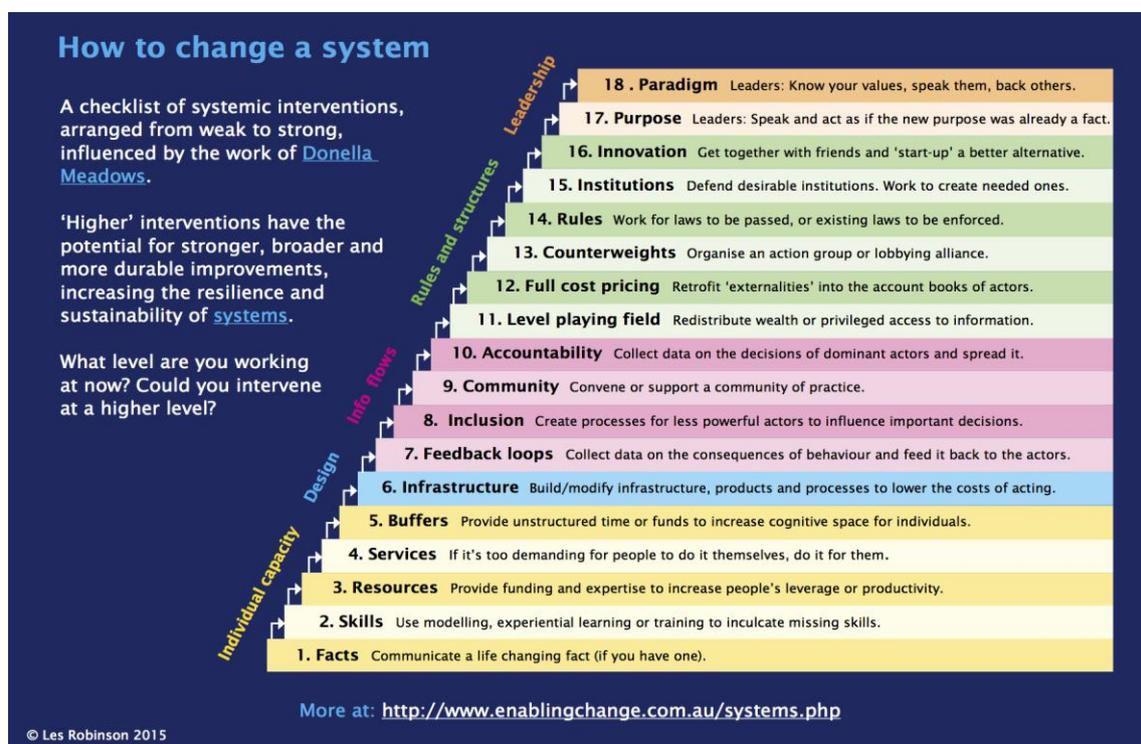


Source: Robinson, 2015.

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**Box 21. Using simulations for obesity, Nat'l Collaborative on Childhood Obesity Research (USA)**

Childhood obesity is a very complex problem which includes traditional risk factors (nutrition, physical activity, predisposition), and also environmental factors (interpersonal, community and intersectoral dynamics).

In 2009 the Centers for Disease Control and Prevention, National Institutes of Health (NIH), Robert Wood Johnson Foundation, and US Department of Agriculture formed the National Collaborative on Childhood Obesity Research (NCCOR; www.nccor.org). The goal of the organization was to address the growing childhood obesity epidemic in the US by building research, surveillance capacity and use innovation to stimulate systemic thinking to generate fresh, synergistic ideas to tackle the problem. The collaborative effort is also intended to help accelerate policy change based on systems insights. In 2011, NCCOR launched the Catalogue of Surveillance Systems and the Measures Registry (www.nccor.org/measures) to make freely available resources on system characteristics connected to childhood obesity.

Two NCCOR affiliated networks, the Childhood Obesity Modeling Network and Envision, implemented systems-based approaches focusing primarily on understanding childhood obesity in developed nations. For example, Envision tries to use computational simulation models to create learning laboratories that mimic reality and test virtually different combinations and sequences of childhood obesity interventions.

Source: Bures et al. 2014; McKinnon et al. 2012.

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350.      Quantitatively models of systems interactions in general rely on predefined goals and causal relationships.[169] Thus, it has limited applicability, especially, concerning social systems as it cannot be very well applied to unstructured problems. Consequently, debate over systems dynamics in social sciences has

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[169] Jackson 2009, S26.

moved from modelling 'external reality' to modelling people's subjective perceptions.[170] Since the late 1970s, *'soft systems'* approaches have emerged[171] next to hard systems/system dynamics approaches as a response to the expansion of systems theory to the social world.[172] Soft systems methodology is more interpretivist, qualitative in nature and considered to be more human-centered.[173] In effect, soft systems approach is understood as a continual process.[174] Thus, the focus is on stakeholders, their views and process as learning. While *hard systems engineering approaches would analyze the system backwards from the desired objective, soft systems methodology would begin by asking what the objective is.* Consequently, it is mostly useful to gain insight into the decision making and planning process in systems. Nevertheless, there is also critique about the relative nature and subjectivity of the methodology.

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**Box 22. Towards methodological pluralism**

Soft systems and system thinking in general has expanded in the social realm since the late 1980s and 1990s when systems thinking was combined with complexity theory, network organization and learning organization theories.[175] The origins of the complexity/chaos theory are in chemistry, chaos and mathematics, which present a challenge to the stability-based orthodoxy because they highlight the importance of instability, discontinuity and nonlinearity. Consequently, soft systems methodology is now used to tackle wicked problems, while it is also understood that complex problems involve various phases and therefore, also different methodologies and approaches may be employed to achieve success.[176] This has led to the parallel development of critical systems theory[177], which sheds light on power relations in systems; usually an ignored dynamic in hard and soft systems theories and multi-methodology or methodological pluralism.

As systems approaches cover various tools and methodologies both from the quantitative to the qualitative (from stock and flow/causal loop diagrams, participatory system mapping, group model building, cognitive mapping, mediated modelling, and even SWOT analyses to strategic choice approaches, etc.) there is a lot to choose from. Nevertheless, hard systems approaches have been more delineated and causal loop diagrams (CLDs)—based in systems dynamics/cybernetics—are still the most frequently utilized to visualize systems.[178] However, this is not problem free. These describe causal relationships between selected variable sets focusing on both negative and positive feedback loops within a given system. Thus, CLDs usually describe existing patterns of systems and fail to describe future behavioral patterns of the system or provide deep insight into how one might intervene in the system.[179]

Recently these methods have been extended to include participatory modelling approaches—for example, participatory systems mapping, group model building and mediated modelling.[180] Participatory systems methods have been increasingly applied in the field of natural resources.[181] Furthermore, in practice most systems approaches use a multitude of methods and no longer distinguish the origins of the ideas in detail.

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351.    While recently there has been a push towards multidisciplinary and methodological pluralism in many fields (described in Box 11), the legacy of formal modelling in systems thinking has led to the assumption that the qualities of a 'systems thinker' or rules of systems thinking can be discretely

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[170] See Lane 2000.
[171] Jackson 2009.
[172] Checkland 1999.
[173] Pepper et al. 2016, 135; Mingers and White 2010.
[174] Checkland and Scholes 1990.
[175] E.g., Kaufmann 1995; Senge 1990.
[176] Mingers and White 2010.
[177] Ulrich 1983.
[178] For example, in the field of sustainable consumption Jackson, 2009; Nemecskeri et al., 2008.
[179] Nemecskeri et al. 2008.
[180] Sedlacko et al. 2014.
[181] E.g., van den Belt et al. 2010.

described.[182] Some authors have concluded that without intensive training in systems methodologies success will be unlikely.[183] Thus, systems approaches have remained rather rigid when it comes to practice and it is not surprising that systems thinking has not come to the fore in many domains, especially the public policy and management communities. However, we specifically align ourselves with the recent developments towards methodological pluralism and problem-based approaches to systems thinking and design. Hence, we call on policy practitioners to avoid the paradigm trap of rigid utilization and encourage them to synthesize different approaches.

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[182] Anderson and Johnson 1997; Meadows 2008; see also a review by Buckle Henning and Chen 2012. For example Buckle Henning and Chen (ibid.) highlight the systems thinking orientation in six different categories: orientation towards (1) causality, (2) logic, (3) particular data sources, (4) explicit and implicit structures, (5) subjectivity, (6) self-reflection.

[183] E.g., Ledington and Donalson 1997

**ANNEX 3: CASE STUDY METHODOLOGY**

352.     Systems approaches are rarely labeled as such. They tend to emerge out of a convergence of dynamics, such as inspired leadership, intractable challenges, access to competent stakeholders/partners and sometimes an unusual funding situation. The framework of systems transformation outlined in Chapter 2 has been used as a general approach to both case selection (identify cases where these processes are evident) and case analysis (understanding how these principles were applied in practice). Case study process focused on understanding how a problem was framed or reframed so that a new solution and possibly methodology could emerge; and at the tactics or actions that were designed and executed with an eye toward systemic impact.

353.     The case studies aimed at:

1.   Identifying areas in which systems thinking will be useful within the public sector.

2.   Providing insight on how systems approaches have been used in different public sector context: differences in methodologies, legitimization, and approaches to uncertainty etc.

3.   Outlining the contextual differences in applying systems thinking in real life situations.

4.   Identifying the challenges and possibilities for systems thinking within the public sector.

5.   Generating awareness about the potential of systems thinking in the public sector.

354.     As systems approaches have different kinds of impacts on governments and governance processes, the study have attempted to produce variety in case studies selection. For instance, some systems approaches and resultant innovations result in governments forming long term working relationships with external partners, while others want to pull a set of methodologies, or even project teams into government itself and establish permanent capacity. It will be useful for public sector managers interested in systems approaches to see the variety of responses possible given the variety of the challenges and opportunities they face.

355.     The case studies have been selected based on prior desk research on the topic. Following criteria have been applied to the selection of cases:

- The case has to deal with a public policy problem, although, connected public service delivery can also lie outside the public sector.

- The public policy problem needs to be complex and systematic in nature: have multiple interconnected explanations, no optimum solution, multiple stakeholders, high levels of uncertainty etc.

- There has to be a potential for transformative effects on the systems level, i.e. current solutions are failing or have limited impact.

- Systems approaches have been used to analyze the problem.

- Cases will be selected in different policy areas: e.g., active and healthy aging, resource efficient production and eco-innovation, transportation and public safety.

356.     The case study analysis utilized desk research and to the extent possible interviews with stakeholders (and if need be questionnaires). Through triangulation of data the case study examines why and which systems approaches were chosen to solve the policy problem, how systems analysis was carried out (what did the process entail, who were the stakeholders, which resources were used, how much time did it take), if the results of the analysis were implemented in public service delivery, what (endogenous and exogenous) challenges were encountered at different stages of the process, what were the perceive or measured effects of applying the approach. The interviews were semi-structured and based on an interview guide utilizing both inductive and deductive questions. Interviews are not recorded, but the information is noted down. Findings and quotes from the former are anonymized to make the participants as open as possible.

## ANNEX 4: INTERVIEWS CONDUCTED FOR THIS STUDY

357.     The following people were interviewed as part of the case studies:

- Joeri van den Steenhoven, Director of MaRS Solutions Lab, 11 October 2016 (teleconference).

- Mikko Annala, Demos Helsinki, 14 October 2016 (Skype).

- Alda Hrönn Jóhannsdóttir, Chief Attorney and Marta Kristín Hreiðarsdóttir, Specialist, Metropolitan Police, Reykjavík, 28 October 2016 (Skype).

- Marc Dinkgreve, Ambassador of Knowledge, Jeugdbescherming Regio Amsterdam, 4th November 2016 (Skype).

- Anne  Bermonte, Government of Ontario – MEDEI, Director, Open for Business Branch and Joeri van den Steenhoven, Director, MaRS Solutions Lab, 14November 2016

- Joeri van den Steenhoven, Director; Idil Burale, Associate and Claire Buré, Program Manager, MaRS Solutions Lab, 14 November 2016.

- Ted Graham, PwC Canada     Innovation Lead, 14 November 2016.

- Chris Schafer  , Uber, Policy Manager, 14 November 2016.

- Peter Wallace, City Manager, City of Toronto, 15 November 2016.

- Tracey Cook,  Executive Director and Vanessa Fletcher, Policy and Planning Advisor, Municipal Licensing and Standards; Carleton Grant, director, Policy & strategic Support, City of Toronto, 15 November 2016.

- Caroline Pinto, Managing Principal, Counsel Public Affairs Inc., 15 November 2016.

- Roberto Pegoraro, Senior Advisor & Technical Expert, Automobile Insurance Policy, Ministry of Finance - Financial Services Commission of Ontario, 15 November 2016.

- Daniel Skilliter, Senior Policy Advisor, Policy and Research, Office of the Premier, 15 November 2016.

- Frank  Denton, Assistant Deputy Minister - Policy, Planning, and Oversight Division, Government and Consumer Services, 15 November 2016 (teleconference).

- Paul Devnich  , Director (Acting) Program Policy and Analytics Branch, Ontario Ministry of Revenue, 15 November 2016

- Joeri van den Steenhoven, Director; Idil Burale, Associate and Claire Buré, Program Manager, MaRS Solutions Lab, 15 November 2016.

- Rodney Ghali, Assistant Secretary; Chad Hartnell, Director of Operations and David Donovan, Lead, Strategic Policy and Innovative Finance, Innovation Hub, Privy Council Office, Government of Canada, 16 November 2016.

- Anatole Papadopoulos, Executive Director, Policy Innovation for Canadian Heritage, Government of Canada, 16 November 2016.

- Kristine Hubbard, Operations Manager, Beck Taxi, 23 November 2016 (teleconference).

- Ericka Stephens-Rennie, Senior Analyst & Program Integration Coordinator, Environment Canada (prior Co-Lead on the Sharing Economy Project, Deputy Ministers' Committee on Policy Innovation, Government of Canada), 25 November 2016 (teleconference).

- Rannveig Sigurvinsdóttir, Postdoctoral Research Fellow, Reykjavík University, 28 November 2016.

- Alda Hrönn Jóhannsdóttir, Chief Attorney and Marta Kristín Hreiðarsdóttir, Specialist, Metropolitan Police, Reykjavík, 28 November 2016 (two separate meetings).

- Andrés Ragnarsson and Einar Gylfi Jónsson, Therapists, Home Peace – Treatment and knowledge center for perpetrators Treatment program for perpetrators, 28 November 2016.

- United Against Domestic Violence Steering group:

- Halldóra Gunnarsdóttir, Gender Equality adviser, Human Rights Office, Reykjavik City, 28 November 2016.

- Stefanía Sörheller, Social Services, 28 November 2016.

- Anna Kristinsdóttir, Director, Human Rights Office, Reykjavik City, United Against Domestic Violence Steering group, 28 November 2016.

- Halldóra Dröfn Gunnarsdóttir, the Child Protection services in Reykjavík, 28 November 2016.

- Ástþóra Kristinsdóttir, Health care system, 28 November 2016.

- Sigþrúður Guðmundsdóttir, The women shelter, 28 November 2016.

- Marta Birna Baldursdóttir, Head of Division, Ministry of Finance and Economic Affairs, Department of Public Management and Reform, Iceland, 28 November 2016.

- Ólafur Örn Bragason, Psychologist and Head of NCIP Educational Center; Margrét Herdís Jónsdóttir, Guðbjörg S. Bergsdóttir and Guðrún Sesselja Baldursdóttir, Office of the National Police Commissioner of the Icelandic Police, 29 November 2016.

- Keeping the Window Open – The Sudurnes project, 29 November 2016.

- Skúli Jónsson, Superintendent, Sudurnes Police District, 29 November 2016.

- Guðmundur Sigurðsson, Detective, Sudurnes Police District, 29 November 2016.

- Súsanna Björg Fróðadóttir, Lawyer, Sudurnes Police District, 29 November 2016.

- Hera Ósk Einarsdóttir, Director of Welfare, Reykjanesbær municipality, 29 November 2016.

- Sigríður Björk Guðjónsdóttir, Chief of Reykjavik Metropolitan Police, 29 November 2016.

- Erica Schriek, advisor, FFP supervisor and team manager Secretaryteams, Jeugdbescherming Regio Amsterdam, 7 December 2016.

- Sigrid van de Poel, Head of Board of Directors, Jeugdbescherming Regio Amsterdam, 7 December 2016.

- Mirjam Coret, Vanguard Advisor and Systems Thinking Consultant, Efexis, 7 December 2016.

- Joris Foekema, Team Manager Facilities, Jeugdbescherming Regio Amsterdam, 8 December 2016.

- Marc Dinkgreve, Ambassador of Knowledge, Jeugdbescherming Regio Amsterdam, 8 December 2016.

- Antonietta Perini, Team Manager Youth Protection Academy, Jeugdbescherming Regio Amsterdam, 8 December 2016.

- Marc Dinkgreve, Ambassador of Knowledge, Jeugdbescherming Regio Amsterdam, 8 December 2016.

- Sirpa Kekkonen, Head of Government Strategy Secretariat, Prime Minister's Office, Finland and Juha Leppänen, CEO, Demos Helsinki, 30 November 2016.

- Johanna Kotipelto, Senior Specialist Policy Analysis Unit Prime Minister's Office, 30 November 2016.

- Juha Leppänen, CEO; Mikko Annala, Head of Governance Innovation and Jaakko Kuosmanen, Adviser, 1 December 2016.

- Kalle Nieminen, Specialist, Ratkaisu 100 -Challenge Prize, SITRA, 1 December 2016.

- Paula Laine, Director, Strategy, SITRA, 1 December 2016.

- Olli-Pekka Heinonen, Director General, Finnish National Board of Education, 1 December 2016.

- Kaisa Lähteenmäki-Smith, Science Specialist; Ira Alanko, Project Manager and Johanna Kotipelto, Senior Specialist Policy Analysis Unit Prime Minister's Office, 2 December 2016.

- Airja Terho, Ministerial Adviser, Ministry of Finance, Finland, 2 December 2016.

- Seungho Lee, Design for Government Program, Aalto University, 2 December 2016.

- Marco Steinberg, CEO, Snowcone & Haystack, 2 December 2016.

- Juha Leppänen, CEO; Mikko Annala, Head of Governance Innovation and Jaakko Kuosmanen, Adviser, 2 December 2016.

- Annukka Berg, Senior Specialist, Government Policy Analysis Unit & Senior Researcher, Finnish Environment Institute 5 January 2017 (teleconference).

- Olli E. Kangas, Head of the Research Department, KELA, 11 January 2017 (Skype).

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