

Systems Thinking And The Practice Of Government

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Keynes once said that ‘there is nothing a government hates more than to be well-informed; for it makes the process of arriving at decisions much more complicated and difficult’. You could say the same of systems thinking. Taking account of all the different interactions at work in any area of policy is without doubt complicated and difficult.

Everyone knows that we live in a complex, profoundly interconnected environment that only loosely fits with the neat models used to describe it. Throughout the 1980s and 1990s, for example, despite very substantial investment, economic forecasters success in making predictions was no better than if they had simply extrapolated one years data to the next (performance is now somewhat better, partly because of a more stable economic environment). Or to take another example: in the autumn of 2000 the fuel crisis suddenly demonstrated the vulnerability of interconnected just-in-time retail systems, as well as the power of mobile communications and political protest, and the ‘viral’ character of grassroots action in a networked society.

There have been some attempts to raise the game of government in terms of systematic modelling, the use of scenarios and learning communities shaped by ‘soft systems’ ideas. Indeed the PIU report ‘Adding it Up’ even prompted the Cabinet Secretary to address a recent annual conference of Operational Researchers.

But systems thinking – especially in its broader meaning - remains largely foreign to the everyday practice of government. Governments tend to be happier with simple causal relationships, relationships between inputs and outputs, rather than with interdependent phenomena. Most of the language and metaphors of government derive from an 18th or 19th century world of mechanical regularities, not from the era of IT and bioscience. Policy-makers still generally talk about ‘pulling levers’, ‘driving through change’, and about government as a machine. The business of the state is still largely organised in departmental silos, not greatly different from those of the late 19th century, with mental maps that presume a separate universe for schools, criminal justice, public health, housing or transport. A fairly one dimensional economics is still dominant in many fields – not greatly informed either by sociology and psychology on the one hand, or by an understanding of the interactions of the economy and the physical or biological world on the other.

Seven factors increasing receptiveness to systems thinking

Seven factors may, however, be changing this and creating more demand for systems thinking in all its forms.

The first is the ubiquity of information flows, particularly in the era of e.government, which means that government now has access to more and faster feedback loops,

more data to match, correlate, interpret and thus - potentially – to comprehend the interconnections between sub-systems, and a steadily rising investment in knowledge management which can – but doesn't always - stimulate a much more sophisticated understanding of the place of information and knowledge.

The second is the pressure in social policy for a more holistic understanding of social phenomena and more holistic responses, bound up in the concept of 'social exclusion' which is deliberately a more 'systemic' concept than say, unemployment or income poverty. For example: to understand teenage pregnancy requires an understanding not only of the inadequacies of sex education, of the detailed rhythms of young teenage lives, but also of the real economic opportunities for girls and boys, their perceptions of those opportunities or the lack of them, the relative status provided by a child and so on. To understand why people sleep on the streets of major cities we need a model that includes the impact of big institutions – local authority care, prisons, armed services; the difficulties of resettlement; the impact of family breakdown; all of which affect many hundreds of thousands but resulting in a relatively small residual of a few thousand that makes all the difference in central Bristol or London.

The third is the environment. Modern systems theory was born with the understanding of open systems dependent on their external environment, and today – unlike government in the 1940s that first used national income models - we see the economy not only as a closed economic system but also as an open system of materials, energy and waste (and of knowledge) – a shift of view that has far-reaching consequences for public policy (for example in relation to waste, or packaging), and for businesses (as some attempt to create closed systems capturing value throughout the lifecycle of a product or service).

Fourth, governments recognise that the connectedness of systems brings with it new kinds of vulnerability. A generation ago our primary concerns were with large scale invasion by an enemy bloc. Today we are as likely to worry about smaller incursions – I've already mentioned the fuel crisis and the fragility of just-in-time systems without buffers or redundancy; we could also mention the risks posed by Melissa or 'I love you' in a world entirely founded on interconnected computer mediated communications; and that of rogue states.

Fifth, globalisation has brought home to every decision maker that the world is now creating one system, or set of systems, out of previously discrete ones – which is why questions of how much to govern explicitly, how much to govern through sprawling informal and semi-formal networks, how much to depend on simple generative rules, how much to create the embryo of global government, are now the most exciting and difficult area of political thought.

Sixth, within education and training there has been a growing interest in the capacities and qualities needed in the modern workforce (and indeed in modern adult lives). These are likely to include - alongside the formal curriculum - not only capacity to collaborate and creativity but also ability to recognise systemic patterns, to cope with ambiguity, and non-linearity.

Seventh and finally, governments have painfully learnt the lesson that planning and rational strategy can often lead to unintended consequences, unforeseen systemic

effects, so that today's governments prefer to walk more lightly, to be more attuned to complexity, more wary of writing the world into simple measures than their predecessors. In parallel there is more understanding of the vulnerability of local and national systems, societies and economies without requisite variety – and thus a view of the role of government as being to provide the conditions for self-organisation, whether by markets or communities.

Out of all of these factors has come a common understanding that we live in a world of complexity, of non-linear phenomena, chaotic processes, a world not easily captured by common sense, a world in which positive feedbacks can play a hugely important role as well as the more familiar negative feedbacks that we learn in the first term of economics.

The implications for policy and practice

What follows? How does this recognition of the potential relevance of systems thinking influence practice? And how does that practice in turn influence the evolution of systems thinking?

Systems thinking and practice can mean many things – from modelling to soft systems concepts of continuous adaptation and learning, through to the use of complexity models.

But in none of these approaches has yet had much impact. There are many operational researchers in government, and abundant use of complex systems models in some fields, notably defence and health – for example to understand the dynamics of a battlefield or the options for disease screening programmes.

But much of the use of modelling is not fully informed by systems thinking, or recent advances in understanding of complexity; similarly the versions of Cost-Benefit or Benefit-Cost analysis that are used generally focus solely on aggregated individual preferences – which can be very misleading in the context of public policy.

In some parts of the public sector – such as the US Navy or the Singapore civil service – systems thinking, and the sophisticated use of scenarios to tease out surprising linkages and unintended effects, is part of the core curriculum. But it would be wrong to say these were part of the bloodstream more widely.

Part of the explanation lies in the nature of government. The inner logics of government go almost directly counter to the lessons of systems theory. When government faces a problem, or when its environment changes, the first instinct is to find new policies, not to reorganise itself to better process information or better respond. Governments and bureaucracies often see themselves with good reason as stabilising forces, and with rather less reason therefore see themselves as constant forms responding to changing circumstances, rather than as in permanent evolution, or rather co-evolution, with their environment.

But part of the explanation lies in relation to supply. There is a remarkable paucity of sophisticated, rigorous application of systems thinking to pressing policy problems, and few compelling demonstrations of the utility of systems thinking to convince the

sceptical. Moreover systems thinking is not always easy to penetrate; an excess of jargon often combines with the confusion created as the same words as used with very different meanings.

In what follows I try to draw out two sets of issues. One concerns practical policy. The second concerns the morality of thinking systemically.

Applications in policy and implementation

I have already suggested some of the virtues of a systems approach in public policy. My own unit – the PIU - has made its own contribution to promoting a more systematic use of modelling in advance of implementation in the ‘Adding it Up’ report. We have also proposed models of policy making and implementation – in the report ‘Better Policy Design and Delivery’ - that draw on soft systems concepts and are much more like systems of continuous adaptation and learning rather than linear delivery.

More broadly the virtues of a systems approach become more visible as governments move towards budgeting and organising by outcomes rather than by function.

Take crime as an example. Crime in a modern society is not comprehensible without a complex grasp of the effects of social factors, of risk of capture and punishment, opportunities to commit crimes, alternatives and incentives – all of which can be modelled to some extent, and from which come more effective policies which tackle each of the causes of crime – including long term prevention, the manufacture of cars, the management of public spaces, as well as the effectiveness of policing and punishment. Interestingly the police have made a fair use of systems thinking in training.

Health is similarly incomprehensible without a systems approach, since only a minority of gains in health come from the direct impact of health institutions, the rest coming from diet, lifestyle, stress, housing, the environment

In these and many other cases it is essential to adopt interdisciplinary approaches; to map the linkages between subsystems; to design in quick feedback loops for policy (laboratories, zones, pathfinders, pilots); and to create communities of practice, of which the cancer, primary care and other health collaboratives are good examples.

The limits of systems thinking in government

Some of the barriers to the adoption of systems thinking undoubtedly have to do with the huge sunk investment in other disciplines.

However there are some essential limits to the use of complexity and systems thinking in public policy. I will highlight just four.

The first is time to model and analyse. Policy is made and evolves in real time, often under huge pressure. Each additional layer of complexity slows down the job of responding, as does horizontal coordination. So in practice a trade off has to be made

between the advantages of the more comprehensive view and the opportunity cost in terms of decisiveness.

The second is accountability – which is easier with clear simple lines of causation, and clear measures of success. Here too a trade off must be struck between a complex reality and institutions that lose effectiveness if they cannot be held to account (particularly by higher authorities which may not be sensitive to the subtleties experienced by users or local communities).

The third is institutional capacity to think. One of the reasons why it is not inherently obvious that a policy or solution should be as complex as the reality it acts on is that all organisations have a propensity to distort or misunderstand messages; hence pressure for simplicity, repetition, clarity which often fights against complexity.

The fourth is the sheer uncertainty, distortion and unreliability surrounding all data involved in government.

The net effect of these is that often in practice government carried out as a craft with quick learning can be more effective than the attempt to build complex models to serve as guides for policy design. In short in the real world of policy making and implementation at current levels of knowledge, systems thinking is usually more useful as a heuristic tool, something more than a metaphor but less than a useable model. As a result in practice it may be better within government to inculcate frames of mind that are open to complexity than to prescribe particular theoretical models.

Morality and systems

I want to turn briefly to a parallel set of issues which to me are equally important, the moral aspects of systems thinking. There is a strong moral imperative running through much of the most recent work on systems, particularly that of Francis Varela, whose recent book 'Ethical Know-how' stands out as one of the most important works of practical philosophy of the late 1990s, and the pamphlet published this month by Demos from Mary Midgely. Underlying it is a sense of the moral claim for self-organisation – a world made up of institutions, individuals and subsystems that are able to take responsibility for themselves, to connect with others, to internalise a sense of being part of a larger whole.

These ideas pose a deliberate challenge to the dominant ideas of politics and economics – which primarily draw on 18th and 19th century philosophical concepts, and which essentially understand the world as made up of closed systems and separate units, with distinct boundaries (whether consumers, firms or nations). In my book *Connexity* I suggest some of the limits of this world view and some of moral implications of increased interconnectedness; more open and porous nations and individuals, the ubiquity of intelligence, and a view of progress as an aspect of complexity – defined as the combination of differentiation and integration. I set out some of the implications for policy – why it is better to encourage intelligence in the actors than depend on intelligence in the design; why it is better to design systems that can learn and adapt horizontal linkages not through topdown plans; why it is better to allow for mutual coordination – as in the EU – than to depend on directive commands.

I also set out some of the limits to the attractive vision of a world of mutually adaptive self-organising systems:

- The importance of ensuring the continuing vitality of integrative systems – politics and religion - in an era of strengthening subsystems
- The need to deal with the parasites, the free riders, the exploiters of trust in order to preserve the integrity of the system
- The need to foster the values necessary for complexity – above all truth telling and responsibility

This moral agenda seems to me inseparable from the more pragmatic policy agenda, and a vital counter to the tendency of systems theory to gravitate towards an abstract technocracy.

In summary:

The need for rigorous systems thinking is growing. However demand and supply have not successfully been brought together. The fault lies on both sides. The priority now is for theoretical reflections to be matched with rigorous applications of that theory to demonstrate that it generates more insights than the alternatives.

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