

Systems Thinking: From Heresy to Practice

Public and Private Sector Studies

Edited by

Keivan Zokaei, John Seddon
and Brendan O'Donovan



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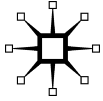
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*To Javad who is the greatest systems thinker I have known.
To Melanie who has been a great inspiration in completing this
book.*

KZ

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Foreword

The distinctive approach to service improvement discussed in this book is systemic and it drives improvement on the customer's terms. These two features are also what lead to the successful outcomes reported in many of the case studies.

John Seddon developed a version of systems thinking from a study of the Toyota Production System, which he regards as the best private sector example of systems thinking in practice, together with other concepts derived directly from the systems literature such as requisite variety. The approach was suitably modified to take account of the peculiarities of service systems. The systems ideas most clearly reflected in these case studies are:

- help managers to think differently (systemically)
- ensure that those doing the work lead the process of system diagnosis and redesign
- design the whole system to serve the customer's purpose
- connect all the elements of the system to contribute to serving customer purpose
- eliminate waste – those aspects of the process that do not contribute to customer purpose
- understand the type and frequency of demand on the system
- design against demand; increase the capacity of the system to respond by giving greater autonomy to those doing the work
- design support systems such as IT systems, only after the main operational system has been designed and ensure they support that system
- evaluate in terms of whether and how the whole system performs in meeting customer purpose
- provide for the continuous learning of those doing the work and their managers

Combined in the systems thinking 'Check-Plan-Do' methodology, which first exposes the reality of the current system's performance, these powerful ideas are capable of increasing effectiveness – doing the right thing by meeting the customer's purpose; increasing efficiency – often

in ways that are counterintuitive; and improving employee morale. The case studies also demonstrate how reductionist approaches, driven by command and control thinking and embedded in regulatory and inspection regimes, targets and lean tools, inevitably make things worse. They encourage systems to do the wrong thing, driving up costs and damaging morale.

The second distinctive feature in the case studies presented in this book is the commitment to customer purpose. Systems thinkers bring the bad news to men and women of action that everything is interconnected; therefore it is very difficult to know whether a change made in one part of a system will make the whole system better. Systems thinkers narrowly escape being shot because they are willing to draw a boundary around their enquiries in order to get things done. They insist, however, that when a boundary is drawn it is explicit and that there is reflection upon the nature of the boundary and what elements and viewpoints it includes and excludes. The systems thinking approach – discussed in this book – draws its boundary by including those elements and perspectives that serve the customer's purpose, and is wholly explicit about this. In this respect, the editors are right to identify it with 'hard systems thinking', although it is a very sophisticated example. Systems thinkers of other persuasions will argue that there are circumstances when the boundary is appropriately drawn broader, to incorporate consideration of other processes that might best be redesigned alongside the process of choice or other stakeholder purposes. Be that as it may, as these case studies show, drawing the boundary and taking action based on a strong definition of customer purpose is not a bad place to start. It may be the only place to start when radical change is so urgently needed to protect and improve the performance of our public services in the face of severe financial cuts.

PROFESSOR MICHAEL C. JACKSON
October 2010

Contributors

Editors

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John Seddon is an occupational psychologist, management thinker, and leading authority on change in organisations. He is a vociferous critic of centralised 'command and control' management of the public sector. John insists managers will discover they would be far better off if they knew how to manage for flow rather than aiming to create economies of scale. He is credited with translating the principles behind the Toyota Production System (TPS) for service organisations. John is a Visiting Professor at Cardiff and Derby Universities, and is managing director of Vanguard Consulting. He is author of *Systems Thinking in the Public Sector: the Failure of the Reform Regime and a Manifesto for a Better Way* (Triarchy Press, 2008).

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1

Introduction

Keivan Zokaei, John Seddon and Brendan O'Donovan

The objective of this book is to enhance the understanding of service management concepts and their applications to service design. Arguably, little progress has been made since Ted Levitt's influential *Harvard Business Review* article 'Production-Line Approach to Service' was published in 1972. Since then, it has been common for services to be treated like production lines in the academic literature and more widely in management practice. However, the belief that achieving economies of scale will reduce unit costs has been a common feature of management decision-making.

One of the authors (John Seddon claims to have translated the principles behind the famous Toyota Production System and made them applicable for service organisations (Seddon, 2003). The Toyota Production System is just that – a system designed to produce cars at the rate of demand. Its originator, Taiichi Ohno, realised a number of counter-intuitive truths, ideas that challenged conventional management wisdom. When service organisations are studied as systems, they reveal similar counter-intuitive phenomena.

This book aims to:

- explore the application of systems thinking to a variety of public and private sector service organisations;
- draw distinctions between conventional approaches to change in both service and manufacturing organisations and those using systems thinking methods;
- illustrate the counter-intuitive truths revealed by studying service organisations as systems; and
- illustrate with case studies how organisations have been redesigned using systems principles, resulting in a strong impact on performance and morale.

We have compiled chapters from practitioners and management theorists working in operations management on the topic of systems thinking in service organisations.

Background of systems thinking

Until the middle of the twentieth century, the dominant method of scientific inquiry into an organised system was to reduce it into separate elements, and to study each element individually. Underlying this reductionist approach was the notion that the whole is no more than the total sum of its parts. However, during the 1930s and 1940s, both scientists (von Bertalanffy, 1940, 1950; Wiener, 1948) and philosophers (Fries, 1936) gradually realised that a complete understanding of a system required holistic study of the individual constituents of the system as well as their inter-linkages and the relationships with the wider system. Underlying this systemic approach is the idea that additional characteristics emanate from the whole which are not attributable to any particular part of the system; in other words, the system is more than just the total sum of its parts. Systems thinking then is 'the scientific exploration of "wholes" and "wholeness" which, not so long ago, were considered metaphysical notions transcending the boundaries of science' (von Bertalanffy, 1972, p. xviii). Flood (1999) states that 'we can only meaningfully understand ourselves by contemplating the whole of which we are an integral part.'

Although initially introduced in science, systems theorists soon extended their organismic metaphor to include social and man-made entities. As such, systems thinking diffused into disciplines such as general management (Deming, 1982; Ackoff, 1971), logistics (Forrester, 1958), cybernetics (Wiener, 1948), and most recently in the service industry (Seddon, 2003). Systems thinkers in service industries have also drawn upon the ideas developed in manufacturing in Japan after World War II, especially those of influential thinkers such as Deming (Deming, 1982) and Ohno (1988) (Seddon 2003, ODPM 2005).

Deming was a distinguished management advisor to the Japanese during the American post-war reconstruction of their economy. He argued that Western organisations and thus Western economies were in crisis because of their beliefs in flawed management assumptions. 'Most people imagine that the present style of management has always existed, and is a fixture. Actually, it is a modern invention – a prison created by the way in which people interact' (Deming, 1994).

Deming's point was simple: mankind invented management, therefore mankind could reinvent it. His work included a scathing and detailed critique of Western management assumptions. The main targets for criticism were the use of arbitrary measures to govern the way work is managed, the management of separated functions independently within an organisation, and the separation of decision making from the worker. The better alternative, he argued, was to understand and manage organisations as systems.

Taiichi Ohno and the Toyota Production System (TPS)

The tale of the superior performance of Toyota over its mass-producing competitors was first brought to widespread Western attention by *The Machine that Changed the World* (Womack, Jones and Roos 2007). First published in 1990, Womack, Jones, and Roos' book used the term 'lean' to describe what had occurred at Toyota. Through experimenting first with simple die-change techniques (ways of stamping metal sheets), Toyota discovered that they were able to perfect the whole process until it was reduced from taking one day down to only three minutes. In doing this, Ohno made the first of a series of counter-intuitive discoveries: it cost less per part to make small batches of stampings than to produce them in large batches. Seddon and Caulkin (2007) saw these discoveries as Ohno realising over time that economy of flow was superior to economy of scale, and that, in order to see flow, he needed to understand his organisation as a system: 'Ohno's creation, the Toyota production system (TPS), is the most strikingly successful example of systems thinking applied to business organization.' Ohno, the architect of the TPS, was thus claimed by the authors as a systems thinker.

The belief that achieving economies of scale will reduce the unit cost is a common feature of management decision-making which ignores the innovations of Ohno and the TPS. As technological advances have produced more sophisticated IT and telephony, it has become easier for conventionally-run firms to standardise and off-shore their services in the pursuit of lower costs. The development of the 'lean' movement in the years following Womack and Jones' initial popularisation of the term has only helped to emphasise the same underlying management assumptions: by managing cost and workers' activity, organisational performance is expected to improve. Through misinterpretation of the core paradigm of management, 'lean' has become subsumed into the 'business as usual' of conventional service management. As a result, 'lean' has become synonymous with 'process efficiency' and the

opportunity for significant performance improvement – as exemplified by Toyota – has been missed.

Taken as a whole, an underlying theme emerges from the studies included in this book that the focus for the design and management of services needs to be on *delivering effectiveness*, which can be achieved by providing exactly what the end customer wants; no more and no less. If a system is designed against this ideal, it can continually perfect the way it works to deliver value to the end customer. In transactional systems, this is achieved by having an excellent understanding of the demands being placed on a service by customers and then by continually improving the way the system delivers against these demands. In the public sector, through studying demand and the flow of work through a system, it is possible to discover that there may be services for which there are no demands, and yet there may be other demands which an organisation does not currently cater to, but may indirectly affect another public service if it is not dealt with (e.g. demands of older people on Adult Social Care services which are not dealt with and instead become acute health demands on the NHS). This also offers an indirect route to efficiency: do what matters to a customer, get it right the first time, and operations will become optimally efficient.

Seddon (2003) proposes a systems thinking approach which is more akin to hard system methods where the system is assumed to be identified with a single unifying purpose. Some research suggests that this approach has found success in the UK public and third sectors (OPDM, 2005; Advice UK, 2008). Seddon distinguishes between two approaches to management and the design of work: conventional approaches (which he terms 'command and control') where fragments of an organisation are optimised with little reference to the wider organisation; and a systems approach which focuses on the interrelationship between the various parts of the organisation.

Command and control is defined as 'regulation by management, with its battery of computer and other informational aids... where decision-making is distant from the work and based on abstracted measures, budgets and plans' (Seddon and Caulkin 2007). Systems thinking emphasises not just 'wholeness,' but also the 'thinking of the system' (i.e. that of the managers and workers within a system) which needs to change in order for the system to be able to improve. Table 1.1 shows some of the key differences between the two approaches.

Many chapters in this book report on methods developed for applying systems thinking in service organisations. The application of systems thinking following Seddon's Vanguard Method uses a 'Check-Plan-Do'

Table 1.1 Command-and-Control thinking vs. systems thinking

Command-and-Control thinking		Systems thinking
Top-down	Perspective	Outside-in
Functional specialisation	Design	Demand, value, and flow
Separated from work	Decision-making	Integrated with work
Budget, targets, standards, activity and productivity	Measurement	Designed against purpose, demonstrate variation
Extrinsic	Motivation	Intrinsic
Manage budgets and people	Management ethic	Act on the system
Contractual	Attitude to customers	What matters...?
Contractual	Attitude to suppliers	Partnering and cooperation
Change by project/initiative	Approach to change	Adaptive, integral

cycle (adapted from the Plan-Do-Check-Act cycle recommended by Deming). The Check phase of the improvement provides a framework for understanding and knowledge about the system.

Moreover, it is designed so that the thinking of the participants is changed during the analysis (Seddon 2005). 'Check' opens the eyes of the organisation to the 'command-and-control' principles and philosophy which are underpinning the design of the current system. It is these command-and-control principles which cause the suboptimal performance of this system. Thinking needs to be changed before acting on the system and achieving improved performance.

Another key feature in the following chapters is the issue of targets and measures in the service sector, and particularly in the public sector. Many of the cases show how imposing arbitrary measures in the shape of targets and standards create a de facto purpose (i.e. to meet the targets). Elsewhere, the literature has covered the numerous unintended consequences of centrally set targets, and their limitations in the public sector (Bevan and Hood 2006). The requirement to 'meet the targets at all costs' leads to the instances of so-called 'gaming,' becoming myriad. Also, by specifying how services should be run against standardised models, the ability of local service providers to innovate and continually improve is removed (i.e. 'dumbed-down' standardisation).

This brief introduction considers the role of broader systems thinking in the management literature, the development and innovations which

emerged in the Toyota Production System, and the translation of these principles for their application in service systems. Many of the chapters delve deeper into the methods involved.

An overview

This book consists of two parts. Part I, which follows this introduction, consists of seven chapters and each presents a different case or different aspect of applying systems thinking in the public sector from Local Authorities to Housing Associations to Shared Services. Part II includes four chapters written by experts who look at the application of systems thinking in the service industry in the private sector ranging from utilities to banks to software development. The last chapter in Part II is a case study from the manufacturing sector. On the surface, this may be considered an odd addition for a book that focusses on service management, but the last chapter is valuable in that it refers to some of the fundamental building blocks of operations management that are highly relevant to both manufacturing and service industries.

Part I – Public sector case studies

In Chapter 2, Zokaei discusses how systems thinking can provide a framework for change by illustrating some of its key features deployed in the redesign of a social service system. Zokaei presents a case study of a Disabled Facilities Grant service in a Local Authority emphasising the following key aspects of the systems thinking intervention:

- In systems thinking the emphasis is on 'effectiveness thinking' as opposed to 'efficiency thinking.' Effectiveness is described as doing the right thing and efficiency as doing things right. Effectiveness thinking is concerned with quality and service, whereas efficiency thinking is concerned with cost and activity measurement. As one of the leaders of the service studied in Chapter 2 put it, 'if we focus on delivering service to citizens in the process of doing so we also become more efficient.' This is a counter-intuitive moment; yet all managers who have led various systems thinking interventions presented in this book at some point allude to this principle. This principle is especially important at a time that public services are facing great pressure to deliver efficiencies. Senior management in the public sector should realise that by focussing the improvement initiatives on cost, they are likely to increase costs. On the other hand, by focussing on delivering the purpose from citizens' view points, they

are likely to reap great benefits as described in all seven public sector case studies in this book.

- In systems thinking, improvement always begins by understanding the work (i.e. seeing the real thing in the workplace). In order to be truly effective managers, champions should be intimately involved with the system they are trying to improve. Improvements are therefore work based and bottom-up as opposed to the all too common approach of ‘mandating best practices’ in public services, which rarely works.
- Action learning is at the heart of systems thinking. The author explains that action learning not only ensures that solutions are work based and context rich as discussed above, but also helps people to surface their underlying assumptions and change them after experiencing the (often negative) effects of their own unconscious values. This is referred to as normative education and is deeply rooted in the works of systems thinkers such as Argyris (1999) who call for unlearning through hands-on experimentation before deciding upon new solutions.

The case study in Chapter 2 illustrates how applying these underlying principles of systems thinking leads to significant improvements including:

- Reducing the average end-to-end time of the service from 675 days to 64 days. That is, more than a 90 percent improvement.
- Reducing the (activity) cost of delivering the service (i.e. staffing costs for administration) from £499 to £319. That is, a 36 percent improvement.
- Reducing the average cost of the physical works from £7000 to £6300. That is, a 10 percent improvement.
- Reducing failure demand from 71 percent to 40 percent.
- But most important, the case study shows that by providing service in time citizens could increase the length of stay at their own residence and delay transfer to care by 4 years.

In Chapter 3 O’Donovan shows how the perception of large demand for adult social care leads councils to screen out demand (i.e. applicants for the service) through the strict application of eligibility criteria. The author explains that underlying the ‘screening out of applicants’ is the assumption that if all demand is dealt with first time the system would run out of capacity quickly. O’Donovan presents a detailed case study of

an adult social care service in an English Local Authority where screening is part of the service before the systems thinking intervention. He explains how the intervention helped to refocus the service on doing what matters to the end user 'right-first-time' and the removal of screening out procedures. The case study reports an 87 percent cost reduction, i.e. average cost of administration went down from £998 to £134 per case. Moreover, 74 percent of the demand under the old design was failure demand whereas less than 10 percent of the demand under the new design (post intervention) was failure demand. Interestingly the case study reports a 'perceptible drop in the overall demand' by more than 30 percent. Often, a concern associated with removing the screen out systems such as the one reported in Chapter 3, is that it would lead to a spike in demand. However, O'Donovan makes a case for understanding the demand better and trying to solve citizens' problems 'first-time-right' rather than screening out or otherwise delaying by the service on the 'assumption' of lack of capacity. The case study shows that the administrative cost of delivering the service was £998 where the actual service cost only £105. This was partly due to the extremely bureaucratic way in which the service was delivered. O'Donovan draws attention to Taguchi's concept of 'nominal value' and how it sits at the heart of Seddon's systems thinking intervention method. O'Donovan concludes that 'by focussing on the customer's nominal value and effectiveness (better service and an improved service user experience) systems thinking was able to deliver substantial efficiency improvements as a second order result. This is the same continuous improvement experience as witnessed in the Toyota Production System. By eradicating the requirement for "feeding the performance machine at all costs" from this system, there was less of what Taguchi would call the "loss to society" from not having delivered to the customer's nominal value.'

In Chapter 4, Hamer and Lethbridge address the issue of shared service centres in the public sector. There has been a lot of support for shared service centres driven by the notion that economy of scale lowers costs. System thinkers have long argued against the fallacies of the economy of scale. Taiichi Ohno, the father of Toyota Production System, said 'an increase in production volume shouldn't necessarily mean a decline in unit costs any more than a decline in volume should mean an increase in unit costs. Those sorts of things happen as the result of arranging things poorly' (Ohno quoted in Shook, 2010).

Hamer and Lethbridge provide some evidence illustrating that the shared service improvement programme did not necessarily deliver the promised benefits. The authors then discuss some of the reasons why

many change initiatives don't deliver in public sector organisations. They demonstrate how focussing solely on meeting the Service Level Agreements which were not driven from customer needs lead to customer dissatisfaction, failure to deliver the real purpose, and employee disengagement. The authors conclude that 'dislocation from the customer and measurement systems focussed on optimising parts of the end-to-end process comprised a system condition which obstructed workers from being able to deliver the best services.' This is a work in progress and a new phase of the programme is being developed. The new programme will consider that a problem solving ethos and continuous improvement culture must be supported at every level of the organisation.

Chapter 5 presents a case study from Portsmouth Housing Association revealing how they worked with suppliers to deliver truly remarkable improvements. The case study demonstrates how Portsmouth Housing Association reduced end-to-end time of the repairs and restoration service by 71 percent (from on average 24 days to less than 7 days) and reduced failure demand by 75 percent (from 60 percent to 14 percent). Moreover the case study reports how an individual contractor reduced their cost per job by 56 percent, from £258 to £114 while increasing capacity by 265 percent (from 85 jobs per day on average to 225 jobs per day), allowing them to accept additional work from other contractors who were not willing to apply systems thinking principles (or improve as quickly) with the same number of staff. This case study of collaboration demonstrates the potential to rewrite the guidance on strategic partnerships, and to serve as the benchmark for economic performance in the public sector. In this chapter, O'Donovan and Zokaei, also explain a tale of organisational change and how the existing policies and procedures adopted by the Audit Commission failed to recognise the improvement delivered at Portsmouth.

The overall domain of research in Chapter 6 is organisational change; Marshall looks into the growing interest in systems thinking in the housing sector and explains how systems thinking brings about organisation change, improvement, and performance. He provides an overview of the underpinning philosophies of systems thinking contrasting it to the command and control philosophy which underlies conventional management. Marshall asserts that 'conventional management employs a command and control paradigm; is top-down and hierarchical, separated from the work, target and budget driven with an ethos of central control and reaction instead of learning and adaption.' The chapter presents and examines quantitative data related to the impact



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