

A course of systems reading

My aim in writing this book is to introduce what I believe are some of the most powerful systems ideas to a lay audience of practicing managers in the hope that they will find them useful and that it will stimulate them to want to learn more. I therefore feel obliged to provide some guidance to the many other sources of systems knowledge out there, but I approach this task with trepidation.

There are a number of reasons for this.

Firstly, although I have read more than most, I know that there will be many rich sources of knowledge that I will have missed, and that I will offend friends by failing to mention their favourites (or their own books!).

Secondly, I have learned that it is rare for a book that had a profound influence on one person to have the same impact on another. This is partly due to the individual style and preferences of author and readers and a host of other idiosyncratic factors. But most of all I have found that the books that have had the biggest impact on me are ones that fulfilled my personal learning needs at the time that I read them. Because what worked for me then won't necessarily work for you (or me) now, I expect many of my recommendations will disappoint readers.

Nevertheless, when exploring new territory a fallible guide is better than none at all, so I will do my best to point out features of the systems landscape that I think will be of most interest to a newcomer and provide my personal interpretation of the significance of different sources and traditions in systems thought from my perspective of a practical person interested in building better organisations.

I will confine myself to those authors who consciously write from a systems perspective, not those whose ideas can easily be interpreted or easily parsed into systems ideas or language. If, like me, you believe that systems concepts can be used to understand and explain a wide range of real world phenomena, then most authors with something useful to say could fall in this category...and in this book I have already referenced a mere handful that happen to have struck me to have articulated ideas that add to the written records left by self-consciously systems thinkers.

I started my journey by reading Stafford Beer's 'Brain of the Firm'. On first reading I understood one paragraph in five but that was enough to convince me that I had discovered what I had been looking for. 'Brain' was the book in which Beer first articulated the Viable System Model. It brings together ideas that had informed his earlier work in applying 'scientific' thinking to the job of management using the human nervous system as the intellectual framework for his organisational model on the grounds that it contains the features that are necessary and sufficient for any system able to survive in a world so complex that it cannot be specified in advance. He went on to restate the model in 'Heart of the Enterprise' in a more rigorous way using Ashby's Law of Requisite Variety to derive it from first principles.

Although 'Heart' is better structured than 'Brain' I suspect most new readers will struggle, like I did, to identify the meat of the ideas without being distracted by Beer's asides, intellectual jokes and personal hobby horses. As a result, I recommend that newcomers start with 'Designing Freedom' which was a script for a series of radio broadcasts. Although it is based on his work in Chile, rather than a commercial organisation, it is written in a simple and engaging way and explains how what some have interpreted as a technocratic design designed to bolster the power of elites is the exact opposite...a framework that safeguards and enables liberty.

If you want to delve deeper into the VSM then proceed to 'Diagnosing the System' which started life as a course for University students. Of the many books written about the VSM by people other than Beer (who is not always the best advocate for his work) my personal favourite is 'Cybernetics: A New Management Tool' by Barry Clemson. If you are more interested in learning more about the historical

context I would strongly recommend Eden Medina's book 'Cybernetic Revolutionaries' which I think is a sensitive and sophisticated understanding of his thinking (there is also a good You Tube video of Medina talking about the book). Andrew Pickering's book 'The Cybernetic Brain' clearly explains the work of Beer and his contemporaries in the cybernetic world and puts it into a historic context.

If you want to explore the history, I recommend the 'dark Hero of the Information Age' - a biography of Norbert Weiner. Steve Heyns had also written 'The Cybernetics Group' about the Macy Conferences in the early 1950's which kicked off the intellectual revolution that gave birth to modern systems theory and the information age through which we are now living.

If you want to learn more about Beer's other works and his life more generally, 'Beyond Dispute' is in part a description of a sophisticated facilitation methodology designed to deal with the difficulty of resolving the complexity associated with reconciling what an organisation is now with what it could be in the future (Team Syntegrity) and part an exploration of obscure speculation about the mystical qualities of geometric objects. David Whittaker has written two books as a tribute to his friend: 'Think Before You Think' and 'Stafford Beer: a Personal Memoir' which weave together anecdotes, letters and some of the many articles he wrote. Perhaps the best companion to the book which you hold in your hand right now, however, is the one by Vanilla Beer and Allenna Leonard (his daughter and partner respectively) which embeds paintings and snatches of biographical material within a high level outline of the VSM to create a rounded picture of the man and his work.

If you are more interested in the intellectual substance of Beer's work you need to go back in time, starting with 'Decision and Control' which in my eyes is his masterpiece: a work of stunning originality and rigour with little of the distracting polemics of Beer's later work. Earlier still, two short books, 'Management Science' and 'Cybernetics and Management' illustrate how his thinking developed over the years leading up to his seminal works. To really understand the provenance of his work, however, you need to go back to Ross Ashby who mainly wrote in the 1950's. Ashby was a clinical psychologist by training and came into cybernetics seeking to understand the mechanical principles underpinning the functioning of the brain (see 'Design for a Brain'). In a very short period of time he went on to forensically describe the fundamental principles of cybernetics in a book of pure crystalline logic intended to be a textbook for teaching the new science: 'An Introduction to Cybernetics'.

The famous 'Law of Requisite Variety' comprises just one chapter of this book, but virtually all of the VSM can be seen as the natural consequence of the operation of this one concept, writ large in the hands of someone who fully understood it and its implications. Fast forward another 50 years and Ross Ashby would have been overjoyed to see how people working in the field of cognitive science are rediscovering his cybernetic work and using it to help understand how the brain works, using technology that he could not have dreamed of over six decades ago.

Much as I admire them, I wouldn't recommend a casual reader try to plough their way through either of Ashby's two books. Instead I suggest you dip into a collection of his other writings 'Mechanisms of Intelligence', which are also out of copyright and so can be discovered on the web.

Cybernetics wasn't the only systems show in town at the time that Beer was working. Cybernetics starts from the premise that real world systems are too complex and dynamic to model explicitly and so seeks to understand systemic behaviour from a macro perspective. System Dynamics, on the other hand, is an approach based on the conceptual mapping and mathematical modelling of defined systemic elements created by Jay Forrester at the MIT at about the same time as Beer's was started out.

I find a SD approach a very helpful way of understanding and explaining how simple forms, such as stocks, flows and information feedback, can lead to complex behaviour. But although it is possible to use SD to identify archetypes (such as self-reinforcing loops and cyclical patterns) in ways that might inform management interventions in particular circumstances, personally I find cybernetic concepts more useful in practice, because of the scale of real-world complexity. Sometimes however, the relative simplicity of SD modelling techniques is a benefit: Beer himself used it to build a System 4 model for the Chilean economy precisely for this reason. If you really want to dive deeply into SD, John Sterman's book

'Business Dynamics' is a classic. If you don't aim to become a SD practitioner I would recommend 'Thinking in Systems' by Donella Meadows. I also strongly recommend 'The Art of Interconnected Thinking' by Frederik Visser for a number of reasons. Firstly, it comes from a different perspective – Visser was a German biochemist by background so his work is steeped in a completely different academic tradition to Forrester who was an America engineer. Secondly, Visser combines SD style modelling with cybernetic thinking in a way that isn't found in Anglo-Saxon sources.

Another of the things that has worked to divide and provoke rancour in the world of systems is a dispute about whether systems really exist or whether it just provides a language to help talk about the real world. Systems Dynamics and to a lesser extent Cybernetics are based on the premise that systems are real rather than purely conceptual devices – although most cyberneticians would argue that they are real only to the extent that they are recognised and treated as such by an observer(s). Amongst those that work on the assumption treats 'systems' as an intellectual framework useful for talking about and dealing with the world, in my opinion Russell Ackoff stands head and shoulders above the rest. Although he was more accessible to mainstream managers than most other systems workers, he is no less systematic, rigorous and challenging in his thinking and he was an excellent communicator. 'Ackoff's Best' is an excellent introduction to the work of someone on the 'softer' end of systems thinking. This end of the systems spectrum is densely populated with other people who claim to be 'systems thinkers', and while I understand their nervousness about treating systems as concrete entities, once the label is treated is purely descriptive it loses 90% of its power and gives licence to many second rate thinkers (to put it politely) to claim to be 'holistic'. The next stream of systems thought is particularly prone to this kind of infection.

All the sources that I have referred to above knew each about other's works and to a large extent recognised that they had a common intellectual heritage. In recent years systems ideas have enjoyed a renaissance but there is one that emerged from a completely different source and which largely fails to acknowledge and build on the work of their predecessors. 'Complexity Science' or 'Complex Systems Theory' tends to be associated with the work done at Sante Fe Institute in New Mexico, and it is the result of the confluence of a number of factors. Firstly, there is the recognition that most of the really hard problems in science are associated with complexity, not the relatively simple problems of physics and other 'basic' scientific disciplines. Secondly, the end of the cold war (and the cost of working in hard sciences) left many clever people with a high level of mathematical skills and access to cheap computing power meant that there were a lot of people able and willing to tackle this new and exciting challenge.

Unlike its predecessor in the fifties and sixties the complexity revolution born in the 1990's is well documented by practitioners that are able to communicate their work in an engaging and accessible way. But few people in this field appear to be aware of the similar work done by Ashby and his ilk decades before who, without the benefit of fancy technology and techniques, were forced to think through many of the same issues in a more fundamental way. The result, I believe, is an impressive intellectual firework display that has generated many fascinating empirical insights but (contrary to the title) little in the way of theory or practical models that can be used to inform real world applications – at least in management. No doubt these will come in time, but in the meantime, there are a host of enjoyable books to read. My favourites are 'Complexity: A Guided Tour' by Melanie Mitchell and 'The Origin of Wealth' by Eric Beinhocker the latter of which tries, but doesn't quite succeed, to link the science to the practical economics of commercial organisations. 'Harnessing Complexity: The Organisational Implications of a Scientific Frontier' by Axelrod and Cohen does a great job of enumerating insights from this work but doesn't manage to pull them together in a coherent manner in the way Beer did for the work of Ashby and his peers. But to my mind the most profound work emerging from this stream is described in 'Scale: The Universal Laws of Life and Death in Organisms, Cities and Companies' by Geoffrey West. I am convinced that there is something really important for the leaders and managers of organisations that deserved to be in this book but thus far I have failed to capture it in a way that I could communicate.

Although they are not directly relevant to the practical challenges of management there are a couple of other sources of systems thinking that might be worth exploring. Perceptual Control Theory was developed by Williams Powers as an attempt to create a systems theoretic model for human psychology. Systems ideas are also alive and kicking in biology, Much of this is done at a micro level, in the study of biochemical processes. Fritjof Capra is an author who writes well and has been the source of insights for

me because he explicitly applies systems ideas to the biggest biological questions such as ‘what is life?’ and ‘how do it start?’.

Finally, if you are still puzzled as to how you can take the ideas in this book and apply to them to prosaic tasks that make up your day to day working life, I have written a series of books with practicing finance professionals in mind. Although the systems science is rarely mentioned, most of what you will find in them is based on solid systemic principles. “The Little Book of Beyond Budgeting” describes a control system for managing financial resources which has requisite variety, which traditional budgeting does not. ‘Future Ready’, which tackles business forecasting, is the Conant-Ashby Theorem in action, supplemented by feedback driven single and double loop learning. And ‘Present Sense’ demonstrates how mental models and learning are used to make sense of the world and how to communicate information to match the personal variety of your audience.

Recommended reading: a map

