Heuristic for teaching systems thinking

Conference or Workshop Item

15th INTERNATIONAL UK SYSTEMS SOCIETY CONFERENCE

The Future of Systems Learning
Thursday 1st - Friday 2nd September, 2011.
St Anne's College, Oxford University, UK.

HEURISTIC FOR TEACHING SYSTEMS THINKING[1]

Martin Reynolds
The Open University
Milton Keynes UK
MK7 6AA
Phone: +44 (0)1908 654894
Email: m.d.reynolds@open.ac.uk

[1] The author wishes to thank colleagues working on the postgraduate Systems Thinking in Practice programme at The Open University for nurturing ideas formulated in this paper. Gratitude is also extended to participants of the UKSS Conference (2nd September 2011) for their feedback, and to participants of the *1st International Workshop on Complexity and Real World Applications Using the Tools and Concepts from the Complexity Sciences to Support Real World Decision-making Activities* (Southampton, England, July 21-23, 2010) in which some of these ideas were explored.

ABSTRACT

Systems thinking in practice is a heuristic framework based upon ideas of boundary critique for guiding the use and development of tools from different traditions in managing complex realities. Three interrelated features of the framework are drawn out – contexts of systemic change, practitioners as change agents, and tools as systems constructs that can themselves change through adaptation. A range of tools associated with the Systems tradition have demonstrable capacity to change and adapt by continual iteration with changing context of use and different practitioners using them. It is in the practice of using such tools whilst being aware of significant 'traps' in managing complex realities that enables systems thinking in practice to evolve. Systems thinking can inadvertently invite traps of reductionism within contexts, dogmatism amongst practitioners, and fetishism of our tools as conceptual constructs associated with ultimately undeliverable promises towards achieving holism and pluralism. The heuristic provides a guiding framework on monitoring the development of tools from different traditions for improving complex realities and avoiding such traps.

Keywords

systems thinking, systems practice, boundary critique, reductionism, dogmatism, fetishism.

1. INTRODUCTION

> "Systems literacy is not just about measurement. The learning journey up the ladder of complexity—from quarks, to atoms, to molecules, to organisms, to ecosystems—will be made using judgment as much as instruments. Simulations about key scientific ideas and visualizations of complex knowledge can attract attention—but the best learning takes place when groups of people interact physically and perceptually with scientific knowledge, and with each other, in a critical spirit. The point of systems literacy is to enable collaborative action, to develop a shared vision of where we want to be." [1]

Thackara alludes to three dimensions of systems thinking: (i) measurement and representation of complex situations, (ii) interaction amongst practitioners and ideas, and (iii) critical reflection on such representation and interaction. The question addressed in this paper is how do we teach it? The paper suggests a learning tool or heuristic for developing a systems literacy. The name given to the heuristic is 'systems thinking in practice', the namesake of the UK-based Open University (OU) postgraduate programme to which the author has contributed authorship on a core module Thinking Strategically: systems tools for managing change [2]

In what follows, I'll briefly explain the heuristic framework for systems thinking in practice relating to three constituent activities and associated entities. Features of each entity and the framework as a whole are then examined.

2. WHAT IS SYSTEMS THINKING IN PRACTICE?

Systems thinking *in practice* involves three interrelated activities: (i) stepping back from messy situations of complexity, change, and uncertainty, and *understanding* key interrelationships and perspectives on the situation; (ii) *practically* engaging with multiple often contrasting perspectives amongst stakeholders involved with and affected by the situation, and (iii) *responsibly* directing joined-up thinking with action to bring about morally justifiable improvements. These activities are supported by three (sub)frameworks respectively – framework for understanding (fwU), framework for practice (fwP), and a framework for responsibility (fwR) - constituting what might be called an overall critical systems framework [3] The activities can be represented as a triadic interplay of making judgements associated with boundary critique [4]). This involves continual revising of boundary judgements (systems thinking) with judgements of 'fact' (observing) and value judgements (evaluating) (see Figure 1).

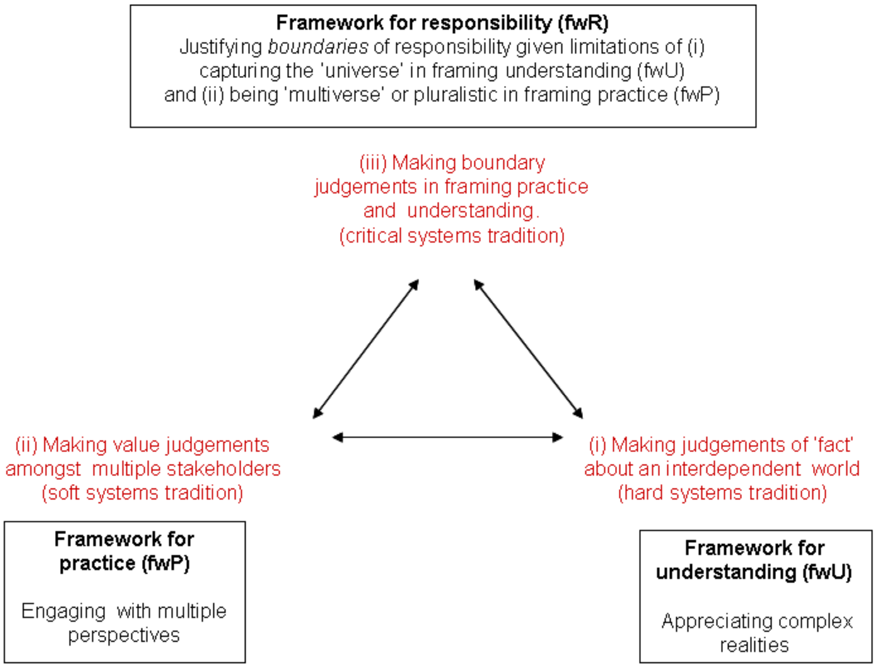


Figure 1 Critical systems framework illustrating systems thinking in practice activities (adapted from [3] p.386)

Developing this into a broader heuristic for systems thinking in practice, three complementary entities can be added: (1) real-world *contexts* of change and uncertainty, (2) people or *practitioners* involved with making change, and (3) the ideas and concepts – including systems - as *tools* for effecting change. Figure 2 illustrates the constituent activities and entities of the heuristic framework for systems thinking in practice.

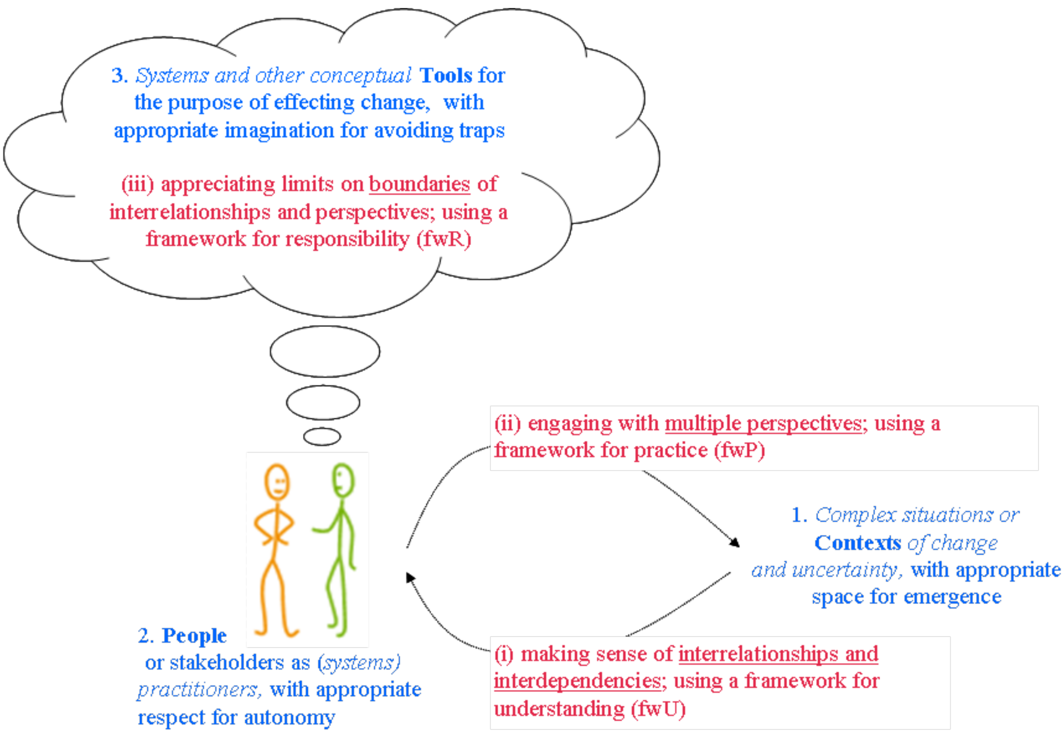


Figure 2 Heuristic framework of systems thinking in practice

The heuristic provides a benchmark for gauging effective action in managing change. Whilst some tools may have a particular focus on one of the three activities and associated entities, the effectiveness of use in supporting decision making can be gauged according to how well all three entities are dealt with. The rich history and current variety of systems tools prompt questions as to how they may relate to each other and what emphasis is given to the context of use, the users or practitioners, or the actual tools being used [6]. The tools used in systems thinking in practice need not be exclusively recognised as being derived from what some recognise as the Systems tradition. They may derive from traditions ranging from Complexity science to Performance arts such as puppetry. Any tools that attempt to (i) make sense of a context of complex realities whilst (ii) enabling amongst practitioners different perspectives on such realities to flourish in order to (iii) enable systemic improvement in the real world, qualify to be exemplars of systems thinking in practice. What matters in systems thinking in practice are the expression of these three entities, but also the interplay amongst all three entities and associated activities, and the resultant dynamics of change that emerge. The following three sections examine each entity and associated activity of the heuristic tool in turn.

3. CAPTURING CONTEXTS OF CHANGE: AVOIDING REDUCTIONISM

> “It’s confusing, but we have a right to be confused. Perhaps even a need. The trick is to enjoy it: to savor complexity and resist the easy answers; to let diversity flower into creativity.” (Mary Catherine Bateson [7], “Afterword: To Wander and Wonder”, p 410).

> "You cannot step twice into the same river." Heraclitus of Ephesus (c.6th Century BC)

In systems thinking the idea of complexity resides not in systems but rather the situations to which systems speak. To use a well-worn though significant adage amongst systems practitioners, a system is merely a *map* of a situation or territory, not to be confused with the actual *territory*. Arguably the prime purpose of systems thinking is to make simple the complex – that is, to bound the unbounded ontological complex realities variously referred to by systems thinkers as messes (Russell Ackoff), the swamp (Donald Schön), or wicked problems (Horst Rittel). Drawing on the signal-to-noise ratio used in the language of communications engineering (cf. Richardson [8]p. 2), systems as conceptual constructs provide purposeful ways for generating meaningful ‘signals’ or patterns of abstracted data sets from the cacophonous ‘noise’ of reality.

Real world complexities represent something that exists outside of any one conceptualisation of context. Whereas complexity science has made valuable and intriguing strides in capturing real world complexity, particularly through computational modelling, systems thinking prompts a more cautionary note against achieving some ultimate understanding of reality.

One significant reference system for depicting contexts generated in complexity sciences is offered by the Cynefin framework [9]. The framework demarcates between simple, complicated, complex and chaotic contexts. A situation is regarded as complex when there is no evident central controlling element but there are strong connections between elements. A complicated situation also has strong connections between elements but is regarded as more knowable and predictable then complex situations because of there being a central controlling element. Simple situations have a very strong controlling element with little interconnections, and chaotic situations have no controlling element and little interconnections between elements.

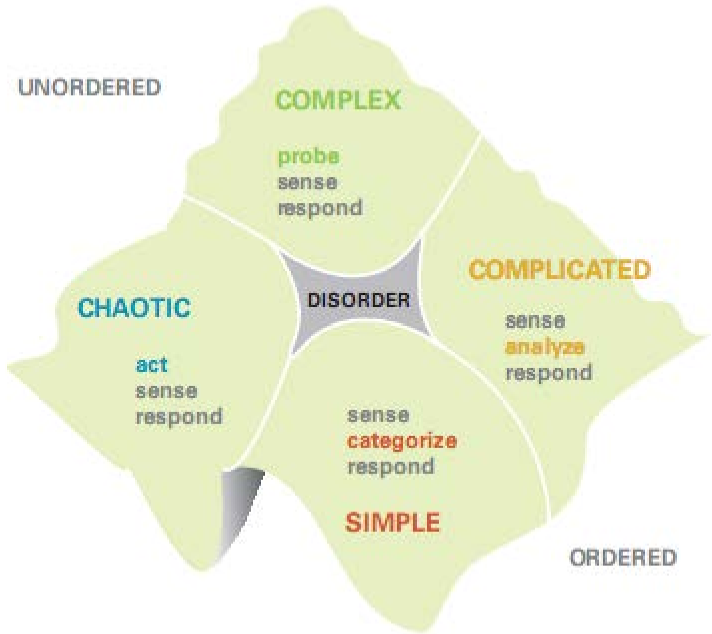


Figure 3 A reference system for understanding realities: Cynefin framework (Kurtz and Snowden, 2003)

A similar reference system used by systems practitioners for appreciating the importance of context is total systems intervention (TSI) [10]. TSI draws upon a system of system methodologies (SOSM) typology to classify situations into six different types. SOSM maps 'appropriate' systems approaches that might be suitable for implementing change in different situations [11]. Table 1 illustrates the SOSM classification along two dimensions – level of complexity (simple or complex), and the degree of shared purpose amongst stakeholders (unitary, pluralist, coercive) along with some typical alignment of systems approaches (including my own guess of where users might likely align VSM and SODA according to the traditions from which they have arisen) relating to perceived realities.

A significant difficulty with TSI as with Cynefin is in assuming from the outset that a problem situation can somehow be easily identified as constituting one of the 'problem situation' or 'context' types. Both Cynefin and TSI make assumptions about knowing whether a situation can be type-cast from the outset. As Bob Williams notes the Cynefin framework does acknowledge possibilities of differing perspectives on the situation amongst stakeholders involved in the situation [12]p.173), but there appears little acknowledgement that the expert practitioner doing the typecasting may also have a skewed perspective. Contexts that are initially regarded through expert intervention as simple or unitary may often turn out to be very complex. A further difficulty with TSI is in the 'fixing' or pigeon-holing of particular systems approaches as being only suitable for specific types of situation. Such pigeon-holing, dependent on the root paradigms of intellectual tradition to which they are perceived to belong, denies the potential for systems approaches to themselves adapt and develop through different contexts of use. It also detracts from opinions on where different systems approaches 'fit' based upon actual experiences of using the approach.

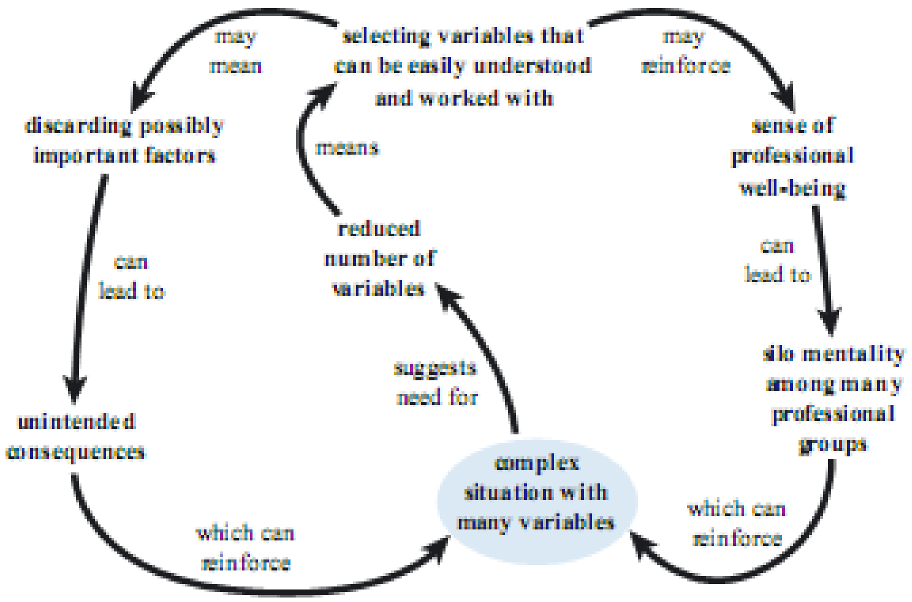


Figure 4 Causal loop of reductionism

As a general rule, any context of use is best regarded as being complex from the outset. From a systems perspective this means a context with variable perspectives on what needs to be done. Systemic failure in intervention can often be attributed to the sidelining of such perspectives. Another rule is that tools – whether derived from Systems or other traditions - are adaptable to different contexts of use depending on different users' experiences.

		Stakeholder perspectives		
		Unitary 'hard' systems based on mechanistic metaphor	*Pluralist* 'soft' systems based on organismic metaphor	*Coercive* 'critical' systems based on prison metaphor
Systems view of problem situations	*Simple*	Simple unitary: e.g. systems engineering	Simple pluralist: e.g. Strategic assumption surfacing and testing	Simple coercive: e.g., critical systems heuristics
	Complex	Complex unitary: e.g., system dynamics, viable systems model	Complex pluralist: e.g. soft systems methodology, strategic options development and analysis	Complex coercive: (non available!)

Table 1 System of systems methodologies
(adapted from Jackson, 2000 [13]p.359)

4. Engaging with multiple perspectives: avoiding dogmatism

> *"A systems approach begins when first you see the world through the eyes of another"* (Churchman [14] p.231)

For West Churchman systems thinking not only requires 'building a bigger picture' of the situation – for which he described a process of unfolding increasingly more variables from the context of use – but also appreciating other conceptual constructs or perspectives on the situation. The transition speaks of two worlds; one, the holistic ontological real-world 'universe' of interdependent elements, encapsulating complex interrelationships; another, an epistemological socially constructed world of 'multiverse' (cf. [15] p.38), encapsulating differing constructs on reality.

Whereas Complexity science regards complexity as residing in the ontological features of dynamic *interrelationships* in the situation, complexity as understood in the systems thinking in practice tradition presented here resides on the layering of differing *perspectives* on the dynamic interrelationships in the situation. People are pivotal to the systems thinking in practice heuristic. As described in the anthology, *Systems Thinkers* [16], our own individual experiences, competencies, skills, as well as weaknesses, shape how we engage with any particular context of change. Part of my own academic and practical experience for example is situated in a context of life-science education and international development. The conceptual tools derived from these disciplines, along with my experiences in using them, have helped me value different tools differently, and to reshape and mould them accordingly in different contexts of use.

In shifting emphases from explicating tools according to contexts of use, towards practitioner experiences and influences as users of tools, Ison and Maiteny [17] captured some of the wider influences and cross-fertilisation that generates innovative development of systems approaches. The aim was to broaden the understanding and practice of spheres of influence both with respect to other tools and approaches outside the traditional systems toolbox, and to other contexts in which such approaches were evident (Figure 5).

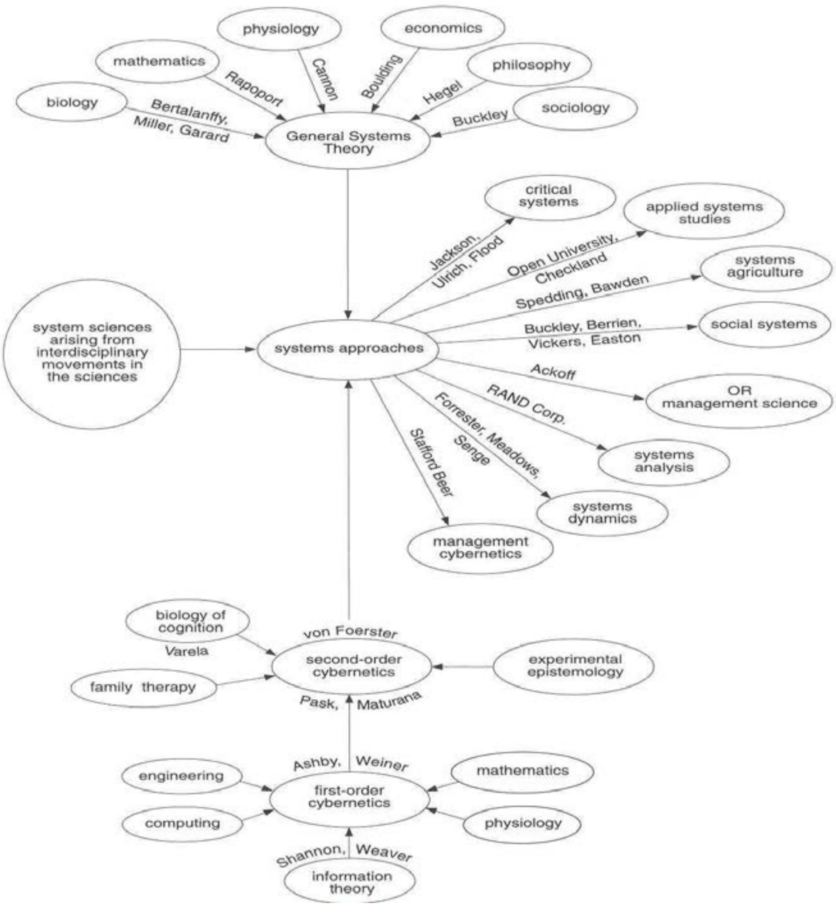


Figure 5 An influence diagram of different systems traditions and some key practitioners which have shaped contemporary systems practice [18]

The importance of simple 'conversation' and language is key to improving situations of change. The tendency for practitioners belonging to a community of practice to become self-referential and insular applies as much to some systems practitioners and complexity thinkers as other communities. The message here is to avoid seeking some methodological purism in testing out any one approach, but rather to explore its validity and adaptation in conjunction with other approaches familiar to the user. A particular feature of robust systems approaches is the sought-after working relationships and dialogues with communities of practice outside of the practitioner community associated with any one approach. Such interactions enhance not only the practice but also serve to strengthen the theoretical underpinning associated with each approach.

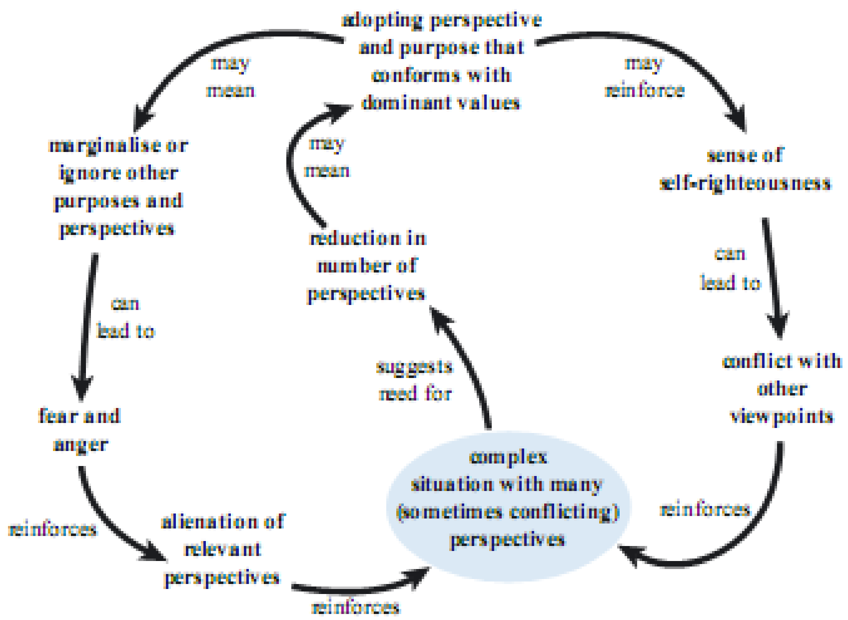


Figure 6 Causal loop illustrating dogmatism

They also serve to protect against the risk of becoming trapped in 'group-think' and model fetishism that can sometimes be a feature of long-standing communities.

5. REFLECTING ON MODEL LIMITATIONS: AVOIDING FETISHISM

"To a man with a hammer, everything looks like a nail" (Mark Twain)

> "True scientific simplicity is never reductive; it is always a relevant simplicity that is a creative achievement…The true grandeur of science is not power but the demanding quest for relevance…How to learn? How to pay attention? How to acquire new habits of thinking? How to concentrate or explore other kinds of experiences? Those are questions that matter" Michael Lissack interpreting Isabelle Stengers [19]p.92).

Our tools and models, including cognitive frameworks as systems tools, can often be sub-consciously overpowering in determining how we approach issues. Similarly, adopting 'new' systems runs the risk of elevating the notion of 'a system' to a fetish status; the panacea for resolving a crisis. Here I use the term 'system' generically, referring both to an ontological construct representing a real world situation (i.e., a 'complex system'), and as an epistemological tool for inquiry into reality.

The trap of systems maintenance, or being obsessive with the tools we construct, lies in reifying and privileging the 'system' - whether it's old or new – as though it has some usefulness, existence and worth outside of the user and some status beyond its value in a context of use. Perhaps the most pervasive example of an implicit system resilient to change is a conventional model of management hierarchically imposed and indiscriminately applied across all parts of an organisation, regarding stakeholders as objects rather than subjects. It is a pervasive way of thinking that continues to hold a widespread grip on management practice. There are many other 'systems' that similarly entrap our understanding and practice. A generic descriptor for these is 'business as usual' (BAU) – frameworks for understanding and practice that stifle innovation. For example, think of the annual cycles of organisational planning, target setting, budgeting, the development of performance indicators and performance related pay incentives etc. BAU models maintain existing 'systems' principally because of a fear for change. But the fear is not evenly distributed amongst all stakeholders. Some fear change more than others simply because the system works in a partial manner. The system works for some and not for others.

All systems are partial. They are necessarily partial – or selective – in the dual sense of (i) representing only a section rather than the whole of the total universe of interrelationships in any context that matters, and (ii) serving some stakeholder parties including practitioners - or interests - better than others (cf. [20]p.41). As described elsewhere, no proposal, no decision, no action, no methodology, no approach, no tool, no system can get a total grip on the situation nor get it right for everyone [3],. In using and designing systems we need to keep an eye on changing contexts and practitioner matters.

With an eye on appreciating matters of context and changing complex realities, there is an imperative to continually ask questions of 'systems'; to appreciate them as *judgements* of fact rather than *matters* of fact. For example, when confronted with situations that appear simple or even complicated, we should be wary of disregarding unvoiced perspectives that may reveal complexity or even chaos. Or when confronted with arguments of an iniquitous 'economic system' generating continual social and ecological impoverishment, or an 'education system' that systematically continues to marginalise particular sectors of our community, do we as systems practitioners have a particular responsibility? Is there a responsibility to create space for, and help support the framing of, better systems, rather than perpetuating the myth that these common currency systems are some God-given realities that we need to live with?

With an eye on appreciating practitioner matters, the risk of systems obsession is akin to moralism. Humberto Maturana makes a relevant point distinguishing between being moralistic and ethical. Moralists, he suggests, "lack awareness of their own responsibility. People acting as moralists do not see their fellow human beings because they are completely occupied by the upholding of rules and imperatives; that is a particular systems design. They know with certainty what to be done and how everybody else has to behave" {Maturana, 2004 #879p.207). Being ethical, in contrast requires giving legitimacy to people, and particularly those who may disagree with the rules.

Systems matter not because they provide some ultimate reification of complex realities, but rather because they provide a cross-disciplinary and transdisciplinary literacy for identifying traps in conventional thinking. Some approaches like system dynamics and the viable system model arising from a holistic cybernetics tradition are particularly good for countering traps of *reductionism* (focusing on parts rather than the whole). Other soft systems approaches like cognitive mapping or soft systems methodology coming from a pluralist interpretivist tradition counter tendencies towards *dogmatism* (privileging one particular perspective). Approaches like critical systems heuristics address similar aspirations but also takes a step back in reminding practitioners of the need to be both modest in making holistic claims - seeing the *whole* big picture (trap of *holism*) - and cautious about claims of being multiverse - taking in *all* perspectives equitably (trap of *pluralism*). Figure 7 illustrates these traps through a causal loop diagram.

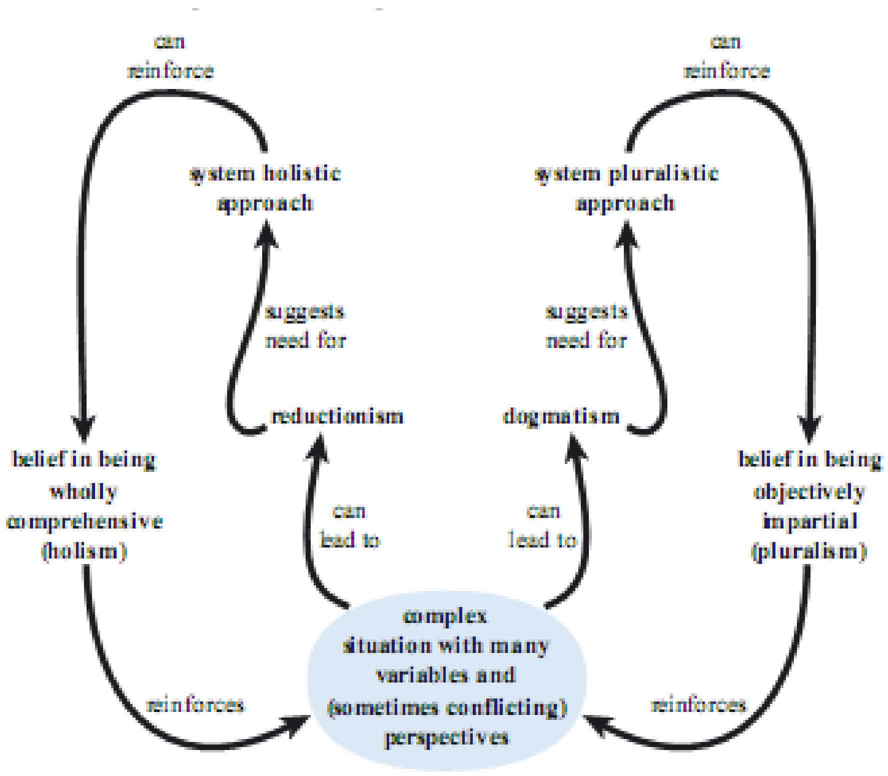


Figure 7 Traps of holism and pluralism in systems thinking in practice

The traps of holism and pluralism can be countered with more reflective practice as illustrated in Fig.8.

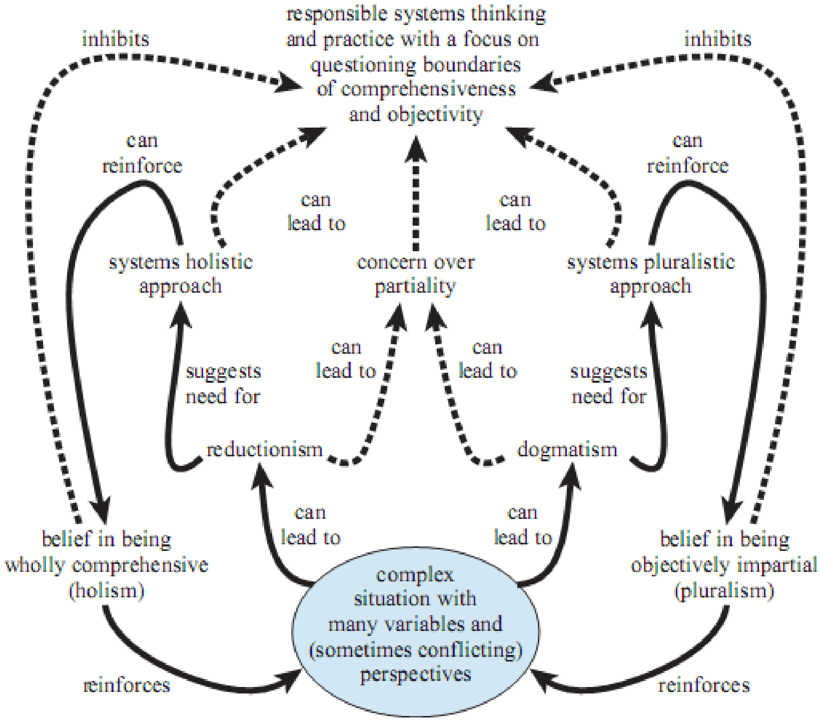


Figure 8 Reflective systems thinking in practice

Whilst different systems approaches have traditional strengths in springing particular traps, many of the robust approaches have evolved with a capacity for dealing with each trap {Reynolds, 2010 #1019}. This evolution and ongoing development of each approach has been a function of the variety of contexts of use and the different users through processes of iteration.

6. Summary: Iterating between contexts, practitioners and tools

> “Clear systems thinking is one of the basic literacies of the modern world” wrote Geoff Mulgan – a senior government advisor in the UK government’s Cabinet Office during the 1990s… “not least because it offers unexpected insights that are not amenable to common sense” [21]

> "Thinking through the triangle means to consider each of its corners in the light of the other two. For example, what new facts become relevant if we expand the boundaries of the reference system or modify our value judgments? How do our valuations look if we consider new facts that refer to a modified reference system? In what way may our reference system fail to do justice to the perspective of different stakeholder groups? Any claim that does not reflect on the underpinning 'triangle' of boundary judgments, judgments of facts, and value judgments, risks claiming too much, by not disclosing its built-in selectivity." (Ulrich[20]p. 42)

Systems thinking in practice might be seen as an expression of Ulrich’s eternal triangle of boundary critique described above. Fig.9 illustrates the dynamic between these entities and the emergent qualities arising from the systemic interaction.

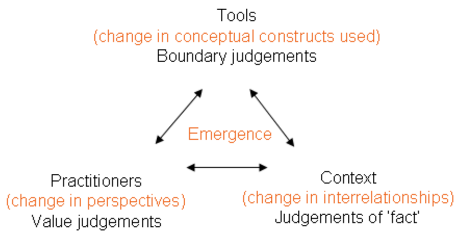


Figure 9 Iteration in relation to change in context, practitioners and tools [6]

Good systems approaches assume that complex realities in the form of messes cannot be resolved or improved upon without engaging in a process that is cyclic and iterative; recognising for example that changes in perspective reveal new insights that require continual revisiting of earlier judgements of the context, and refinement of the conceptual tools with which we use to frame our understanding of, and practice in, contexts of change and uncertainty. There is an ongoing dynamic between the situation (context), the practitioner for any given approach, and ideas (tools),

This iterative quality is akin to the artistic practice of improvisation; a quality associated with the works of Donald Schön:

> "…Schön, who stresses reflection in the midst of action … frequently used jazz as an image of reflection-in-action: the process of improvisation in the moment based on a response to the situation (what other musicians are playing, the audience's response etc), to the established rhythm and melody of the piece, and also on one's own abilities and enthusiasms." [16] p.292).

The notion of improvisation is helpful in grasping some of the nuances of systems thinking in practice as a literacy – a form of communication amongst scientists, systems practitioners and others, in dealing with complex realities.

The name - systems thinking in practice - suggests an important interplay between understanding and practice; systems thinking continually being informed, moulded and (re)shaped by ongoing practice. It provides a tool for nurturing the type of systems literacy alluded to by John Thackara [1]

An approach or tool of any kind of itself cannot guarantee, or even determine success, in managing and improving complex realities. Whilst we may discuss different tools in their abstract sense, any claims towards their value in improving situations are dependent on the context of use and the practitioner's purpose, skill and insights. The systems thinking in practice heuristic presented here supports three intentions behind complexity thinking:

1. Making sense of, or simplifying (in *understanding*), relationships between different entities associated with a complex situation. The prime intention is not to get some thorough comprehensive knowledge of situations, but rather to acquire a better appreciation of wider dynamics – to counter *reductionism* - in order to improve the situation.
2. Surfacing and engaging (through *practice*) contrasting perspectives associated with complex situations. The prime intention here is not to embrace all perspectives on a predetermined problem so as to solve the problem, but rather to allow for possibilities in reshaping a problem-situation – to counter *dogmatism* - for improved possibilities of resolution.
3. Exploring and reconciling (with *responsibility*) ethical issues, power relations, and boundary issues associated with inevitable partial understandings of a situation and partiality amongst different stakeholders. The aim here is not to provide yet another ready-to-hand matrix to offer clients through a consultancy, but rather to gently disrupt and unsettle patterns of thinking – including claims of *holism* and *pluralism* - thereby prompting innovative critical thinking in practice.

Figures 1 and 2 provide graphic illustrations of the heuristic. The Appendix provides a tangible expression of an assessment device guiding the development of skills in systems thinking in practice. This paper presents a departure from Total Systems Intervention (TSI) where systems approaches tend rather to be regarded as fixed externalised artefacts suitable for different well-defined contexts. Robust systems approaches have not developed out of use in restricted and controlled contexts of *either* low *or* high levels of complicatedness. Neither have they evolved as a consequence of being applied only to situations with *either* presumed stakeholder agreement on purpose, *or* courteous disagreement amongst stakeholders, *or* stakeholder coercion. The paper is not a celebration of abstract 'methodologies', but of theoretically robust approaches that have a genuine pedigree for supporting real world decision-making activities. Taxonomic devices like TSI and particularly Cynefin can provide important spaces for exploring the nuanced dynamics of complex realities, but they are maps of the territory and should not be confused with the actual territory. As with any systems construct the value lies in their respective adaptability towards changing contexts of use and changing users.

7. REFERENCES

[1] Thackara, J., *In the Bubble: Designing for a Complex World (extract from chapter 8 found on http://www.thackara.com/inthebubble/toc.html)*. 2005: MIT Press.

[2] Open_University, *TU811 Thinking Strategically: Systems Tools for Managing Change (Study Guide)*. 2010, Milton Keynes: The Open University.

[3] Reynolds, M., *Getting a grip: A Critical Systems Framework for Corporate Responsibility.* Systems Research and Behavioural Science, 2008. 25(3): p. 383-395.

[4] Ulrich, W., *Reflective Practice in the Civil Society: the contribution of critically systemic thinking.* Reflective Practice, 2000. 1(2): p. 247-268.

[5] Reynolds, M., *Bells that still can ring: systems thinking in practice*, in *Complexity and Real World Applications Using the Tools and Concepts from the Complexity Sciences to Support Real World Decision-making Activities*, K. Richardson, Editor. 2011, Emergent Publishing: New York.

[6] Reynolds, M., *Critical Thinking and Systems Thinking: towards a critical literacy in systems thinking in practice*, in *Critical Thinking*, C.P.H.a.J.M. Forte, Editor. 2011, Nova Science Publishers, Inc.: New York.

[7] Bateson, M.C., *Willing to Learn: passages of personal discovery* 2004, Hanover, NH, : Steerforth Press.

[8] Richardson, K., *Thinking About Complexity: Grasping the Continuum through Criticism and Pluralism*. 2010, Arizona, USA: Emergent Publications.

[9] Kurtz, C.F. and D. Snowden, *New Dynamics of Strategy: sense making in a complex complicated world.* IBM Systems Journal, 2003. 42(3): p. 462-483.

[10] Flood, R.L. and M.C. Jackson, *Total Systems Intervention: A Practical Face to Critical Systems Thinking*, in *Critical Systems Thinking*, R.L. Flood and M.C. Jackson, Editors. 1991, John Wiley: Chichester.

[11] Jackson, M.C., *Beyond a System of System Methodologies.* Journal of the Operational Research Society, 1990. 41(8): p. 657-668.

[12] Williams, B. and R. Hummelbrunner, *Systems Concepts in Action: A Practitioner's Toolkit*. 2010, Stanford, CA: Stanford University Press.

[13] Jackson, M.C., *Systems Approaches to Management*. 2000, London: Kluwer Academic/Plenum Publishers.

[14] Churchman, C.W., *The Systems Approach*. 1968, New York: Dell.

[15] Maturana, H. and Poerksen, *From Being to Doing: The Origins of the Biology of Cognition*. 2004, Heidelberg, Germany: Carl-Auer Verlag.

[16] Ramage, M. and K. Shipp, *Systems Thinkers*. 2009, London: Springer.

[17] Maiteny, P. and R. Ison, *Appreciating Systems: Critical Reflections on the Changing Nature of Systems as a Discipline in a Systems-Learning Society.* Systemic Practice and Action Research, 2000. 13(4): p. 559-586.

[18] Ison, R., et al., *Systems Methodologies for Sustainable Natural Resources Research and Development.* 1996.

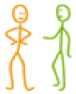
[19] Stengers, I., *The challenge of complexity: Unfolding the ethics of science. In memoriam Ilya Prigogine.* E:CO Special Double Issue, 2004. 6(1-2): p. 92-99

[20] Ulrich, W., *Boundary Critique* in *The Informed Student Guide to Management Science*, H.G. Daellenbach and R.L. Flood, Editors. 2002, Thomson Learning: London. p. 41f.

[21] Mulgan, G., *Connexity*. 1997, Harvard: Harvard Business School Press.

Appendix Assessing a *Systems Thinking in Practice* Practitioner

Adapted from assessment overview for OU students undertaking TU811 module (Open_University, 2010)

Criteria: 	**Broad systemic characteristics** of *being* a systems thinking in practice (STiP) practitioner	**1. Understanding situations** through *engaging* with interrelationships and interdependencies	**2. Practice with systems design** in dealing with and *managing* multiple , often contrasting perspectives	**3. Boundary appreciation** in *contextualising* systems to situations reflecting ethical and political dimensions	**Experiencing** systems thinking in practice through reflecting on experiential ideas from other (non-Systems) traditions (People stream)
Weighting:	(100%) *but* whole is more than sum of parts:	c. 25%	c. 25%	c.25%	c.25%
A 'distinctive' systems practitioner c.80% and above	Can apply a range of key systems tools with ideas from other traditions in a coherent way for supporting strategic thinking.in situations of change and uncertainty. Can vary approach in line with change in context.	Complexity seen as *relating* to the world. Systems used for creatively understanding realities. Excellent with SD & VSM. Identifies reductionism	Appreciates importance of developing perspectives in shaping strategy. Excellent with SODA & SSM. Identifies dogmatism.	Reflects on design of methodology - what's at stake and whose stakeholdings are affected. Excellent with CSH. Identifies holism and pluralism.	Open to relevance of other ideas and traditions outside of systems approaches Can fine-tune strategies based upon such ideas.
A systems practitioner with 'merit' c. 60-80%	Has a solid grasp of systems tools covering all three traditions, which can be applied over a wide range of contexts - but without the innovative ability to reflect imaginatively as with a 'distinctive' practitioner.	Complexity seen as manifestation of interrelationships. Has a good grasp of dynamics and feedback, but less confidence with ideas on variety and autonomy	Appreciates need for facilitating perspectives in making strategy. Has a good grasp of systems tools in mapping perspectives	Reflects need for developing ethical and political awareness in strategic thinking amongst stakeholders but with less confidence in practice	Aware of relationship between Systems and other disciplines and traditions.
A 'good' systems practitioner c.50-60%	Has gist of some systems tools and has some comptetence in a few approaches, but not wholly confident about being a systems practitioner.	Complexity seen as within the world – rather than as relational with the world.	Appreciates multiple perspectives but mostly on a tokenistic level	Ethics and politics seen largely as an interference with systems design for making strategy.	Limited appreciation of other traditions relevant to making strategy.
An 'sdequate' systems practitioner c.35-50%	Has gist of a few systems tools and demonstrates limited comptetence in a few approaches, but not confident about being a systems practitioner.	Situations regarded only at levels of complicatedness in a world reduced to component parts.	Limited if any appreciation in importance of different perspectives.	Ethics and politics of situtaions and systems ignored	Has little time or inclination to value other ideas.
Less than 35% 	Has little or no appreciation of the range of tools in a systems approach. Either not understanding or flouts the principles of systems thinking in practice through being egoistical instead of humble, dogmatic rather than open, and cynical rather than being creatively critical .	Complexity is someone else's fault.. Either wilfully ignores the bigger picture or is not able to grasp simple ideas of dynamics and feedback and emergence.	Not responsive to values, beliefs and circumstances outside practitioners own sphere. Either abuses others' perspectives or ignores them.	Unable to reflect on context and practice. Either ignores and/or does not recognise political and ethical issues amongst stakeholders.	Unable to make cross disciplinary connections. Either a tyrannical belief in only one approach and/or closed to being influenced