

White Paper

Outcomes from the Workshop

Putting Complexity to Work - Supporting the Practitioners

held at

Warwick University

on the

24th September 2009

Authors:

Patrick Beutement. Christine Broenner.
(Including contributions from the Participants).

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EXECUTIVE SUMMARY

This White Paper presents the insights and recommendations arising from a Workshop held on the 24th September 2009 at Warwick University, UK as part of the European Conference on Complex Systems (ECCS'09). The Workshop was called "Putting Complexity to Work - Supporting the Practitioners" and its aim was to understand how to harness more effectively the insights coming out of complexity science to provide practical, relevant support to Practitioners.

The Workshop defined Practitioners as: "Those who deal with complex realities in their day-to-day activity" such as in policy-making, business strategy development; health care; humanitarian aid; social and cultural engagement; local and regional planning; sustainable development etc.

The participants examined some of the issues involved in 'putting complexity to work' such as:

- How practitioners successfully carry out complex tasks without using 'complexity science' - and what complexity scientists can learn from practitioners about their approaches.
- People's experiences of using insights from complexity science - including how you 'convince' people that using insights from complexity science might be beneficial to their 'reality'.
- How businesses and organisations can be supported in order to become more dynamic and resilient in changing circumstances.
- Which mindsets, approaches, tools and techniques might be useful to the various kinds of practitioner communities - and especially, which ones are good in transdisciplinary situations?

As a result of the suggestions and comments from the Workshop participants the following observations / recommendations can be made, that:

The list of suggestions in Section 5, for how complexity scientists can better support the work of practitioners, be more widely circulated to encourage cross-community engagement.

The nascent practitioner / scientist community arising from the Workshop be fostered and expanded - preferably by engaging in a purposeful collaborative activity to achieve a specific outcome of value to practitioners such as:

- the development of a framework for analysing perceived complexity and / or
- having systematic approaches available for selecting techniques and tools.

Further work be funded in the field of education - to both:

- help leaders, policy-makers and managers be aware of alternative approaches (including understanding their defensible value and utility) and
- to support 'front-line' practitioners develop their portfolio of 'complex-reality-ready' techniques and capabilities.

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SECTION 1. INTRODUCTION, AIMS AND APPROACH

INTRODUCTION

1. This White Paper presents the insights and recommendations arising from a Workshop called "Putting Complexity to Work - Supporting the Practitioners" held on the 24th September 2009 at Warwick University, UK as part of the European Conference on Complex Systems (ECCS'09).

AIMS AND STRUCTURE OF THIS PAPER

2. The aim of this White Paper is to document the insights arising from the Workshop so that they can be used to improve support to practitioners - that is, to those who deal with complex realities in their day-to-day work.

3. This White Paper has five Sections:

- This first Section provides definitions and background information (explaining why the Workshop was organised) and describes the underlying complexity principles at stake.
- Section 2 describes the conduct of the Workshop, including the approach followed and the methods used.
- Sections 3 and 4 document the outcomes from the morning and afternoon sessions of Group Work One and Two respectively.
- Section 5 provides an analysis of the outcomes and draws out the common themes which came to light. Section 5 also contains the main output from the Workshop - a set of issues which need to be addressed if Complexity Science is to be 'real-world ready' for effective use by practitioners.

Links to relevant Annexes are to be found throughout the document. Annex A contains acknowledgements, a list of abbreviations and some selected references.

AIM OF THE WORKSHOP

4. The aim of the Workshop was to improve understanding of how the insights coming out of complexity science could be harnessed to support the activities of practitioners.

5. The Workshop was a one-day event - run as part of the European Conference on Complex Systems (ECCS09) at the University of Warwick. It was one of a series of so-called Satellite Workshops which focussed on particular aspects or phenomena in Complexity Science. All the other Satellite Workshops dealt with topics on theory and computational methods of Complexity Science - whereas this Workshop proposal was accepted as it was the only one at the Conference with the intention to bridge the gap between Science and Practice.

6. The Workshop was organised because it was recognised that Complexity Science could give more support to Practitioners - but only if their needs and workaday context were better understood. People *do* manage complex situations every day - yet insights from Complexity Science are not routinely employed as part of the language and techniques used by practitioners in their day-to-day tasks.

7. Definitions. The Workshop's focus was on **Practitioners - defined as: "People who have to engage with the Complex Realities of day-to-day life in their work"** such as those involved in policy-making, business strategy development; health care; humanitarian aid; social and cultural engagement; local and regional planning; sustainable development etc.

8. These practitioners deal with routine situations, but also with the unpredictable and novel events we call **Complex Realities** - defined as: "*Real-world situations which co-evolve with humans in an environment and in a dynamic manner which cannot be stopped and which can only be changed through engagement and influence*". In the Workshop, these Realities were viewed from the various practitioners perspectives shown in Figure 1.

Practice in the context of the Workshop

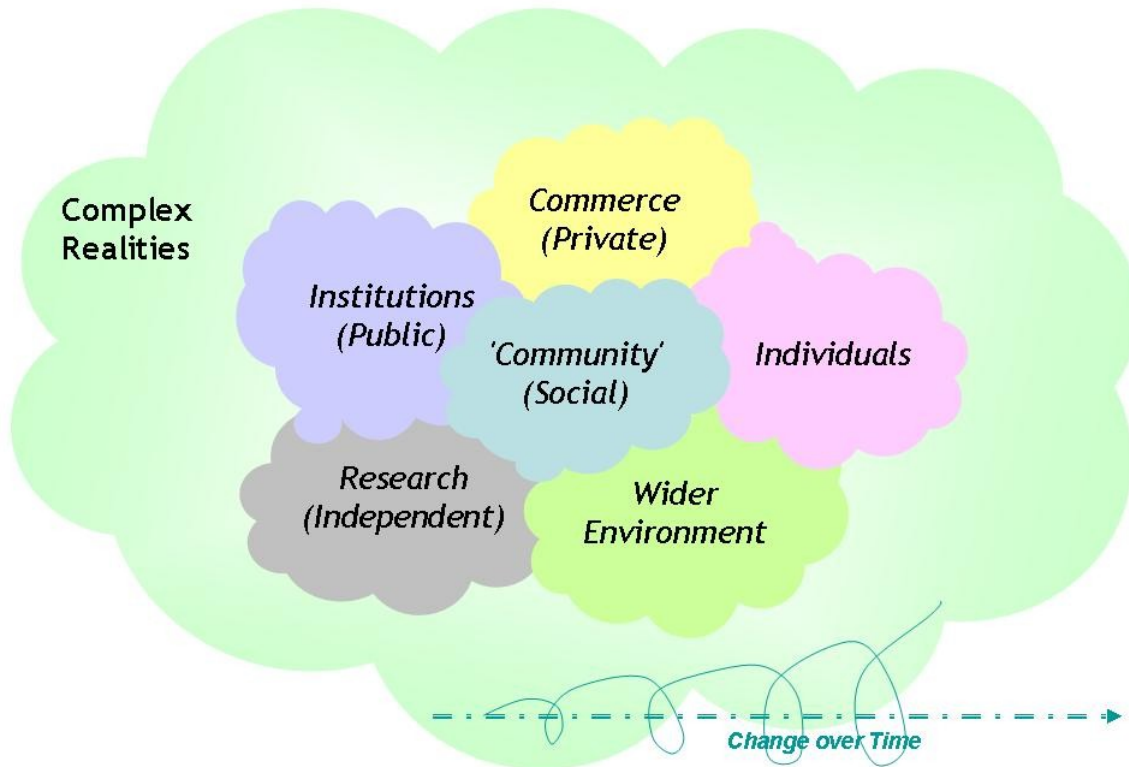


Figure 1: A range of Practitioners Perspectives on the Complex Realities

9. Approach. Which is why, given the range of activities undertaken by practitioners in complex environments, the Workshop brought practitioners and researchers together to discuss how the 'Complexity Community' can better tailor their insights to provide practical, relevant support in these situations. The Workshop had two main sessions as follows:

- a. The aim of the morning session was to explore participants' experiences of dealing with complex realities, develop shared appreciation and to then formulate challenges and advice to Complexity Science from the practitioners.
- b. The afternoon session built on this material and aimed to start addressing these challenges - in particular identifying which mindsets, approaches, tools and techniques might be useful to the various kinds of practitioner communities shown in Figure 1 - and especially which ones are good in transdisciplinary situations. As a result the participants examined some of the issues involved in 'putting complexity to work' such as:
 - How practitioners successfully carry out complex tasks without using 'complexity science' - and what complexity scientists can learn from practitioners about their approaches and techniques - especially how they visualise complex realities.
 - What were people's experiences of using insights from complexity science - including how they 'convinced' people that using these insights might be beneficial to the 'complex reality' at issue?

- How businesses and organisations can be supported in order to become more dynamic and resilient in changing circumstances?
- Which are still the open questions / challenges that need to be addressed urgently - and what are the things inhibiting or enabling their realisation?

COMPLEXITY CONCEPTS AND PRINCIPLES

10. Complexity science would characterise people as being adaptive and reflexive (self-modifying) and evolving. The human interactions across the domains shown in Figure 1 generate social changes which are largely intangible and heterogeneous - as are the influences and 'couplings' between them. It is this diversity that makes life 'interesting' and which generates the complex realities. The Workshop had no intention of providing a tutorial covering Complexity Science concepts (there is a great deal of information available online - see Annex A for some references and Annex B which covers "Complexity for Practitioners – Some Concepts").

11. **Complexity Principles.** Instead it was agreed to take the presence of complex, emergent phenomena as a given and 'normal'. The consequences of this can be expressed as a set of Complexity Principles which were adopted by the Workshop as follows:

- a. As Complexity is normal - it is an opportunity if you know how to deal with it.
- b. Human activity is set within context of the wider World - it is accepted that life is unpredictable and dynamic and cannot be understood in a 'reductionist' manner (as if it were a mechanical device).
- c. Complexity brings about change continually and inevitably - having the ability to adapt, engage and transform are necessary competencies to ensure it is change for the better.
- d. There is no single right or wrong way to approach complexity, but there is a sense of rightness and appropriateness - so search for flexible solutions to complex issues.
- e. One cannot plan for complexity, but one can have a strategy for making sense of it - therefore using a single, fixed linear process won't be adequate.
- f. Complexity resides in many domains - transdisciplinary approaches are essential.
- g. You cannot predict certain kinds of complex phenomena, but you can influence them - by being open to novel opportunities and ready and able to engage with dynamic situations on-the-fly to turn them to advantage.
- h. Anyone who has an interest is a stakeholder - participation is essential to cover the various viewpoints / perspectives, bearing in mind that no single viewpoint is the right one.
- i. There is no absolute measure of complexity - it is relative to the abilities and perceptions of each of the institutions and actors involved. Changing your ability to comprehend it - and acquiring appropriate 'complexity-worthy'¹ capabilities - can make complex situations more tractable.
- j. Feedback and learning from experiences are necessary - being open-minded and appreciative of different viewpoints is a great asset.

The Workshop participants examined Principles such as these and considered their practical implications in terms of what might need to be 'done differently' to put complexity to work. The next section explains how this was carried out.

¹ In the sense of something being 'sea-worthy' (appropriate to the challenges of the conditions and the nature of the environment), one can have a sense of what it means to be 'complexity-worthy'.

SECTION 2. CONDUCT OF THE WORKSHOP

12. This Section will describe the conduct of the Workshop in more detail, explaining how it was organised, who were the speakers (and who attended) and giving an overview of the facilitation and group work techniques used.

SPEAKERS AND ATTENDEES

13. Speakers. A range of speakers were invited from various areas of practice to provide contrasting perspectives on 'complex realities' and how they were perceived and dealt with. The aim being to cover as much of the space of human endeavour shown in Figure 2 as possible. The speakers were as follows (see Annex C for abstracts of their talks and links to their presentations - video material was recorded and is available on request):

- Robert Holloway, AFP Foundation, France. Scene Setter "*Practical Complexity - Do we know what we need to do?*"
- Eileen Conn - Living Systems, UK. "*Community engagement - a social eco-system dance*".
- Anna Plodowski - Peckham Power Project, UK. "*Putting Complexity to Work in Community Projects*".
- Dave Palmer, Phrazzle Associates / Institute of Directors, UK. "*Embracing Complexity and Innovation to Deliver Business Growth*".
- Dr W H Erik de Man, The Netherlands. "*Trans-disciplinary working - Bridging the Gap between Practitioners and Complexity Scientists*".
- Lucian Hudson, Collaborative Strategies Network, UK. Introduction to Group Work 2 - "*Addressing the Challenges - putting Complexity to Work*".

Practice in the context of the Workshop

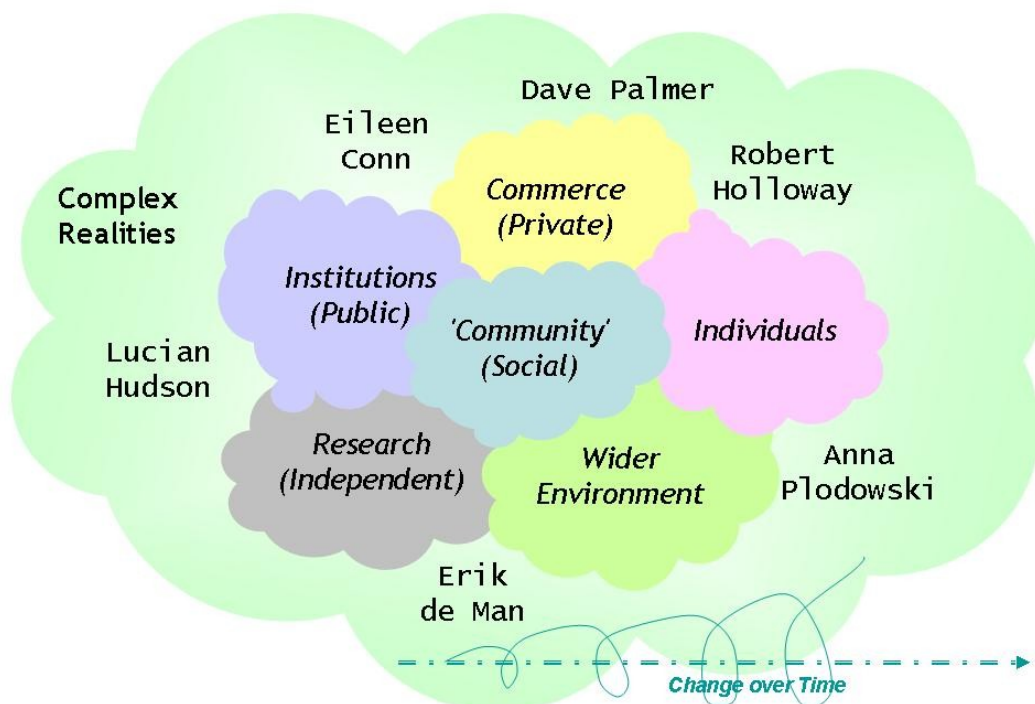


Figure 2: Matching of Speakers' Talks to the Space of Complex Realities

14. Attendees. A list of those who attended and participated in the Workshop can be found at Annex D. In total, over 30 people took part.

PROGRAMME AND TECHNIQUES USED

15. Programme. The programme for the Workshop was as follows:

Thursday 24th September 2009

Slot 1: 09:00 - 10:00	
09:00-09:20	Introduction and Workshop Aims
09:20-10:00	Scene Setter "Practical Complexity - Do we know what we need to do?" - Robert Holloway, AFP Foundation, France.
<i>10:00 - 10:30 Coffee break</i>	
Slot 2: 10:30 - 13:00	
10:30-11:10	"Community engagement - a social eco-system dance" - Eileen Conn - Living Systems, UK.
11:10-11:50	"Putting Complexity to Work in Community Projects" - Anna Plodowski - Peckham Power Project, UK.
11:50-12:45	Group Work - Session 1 - "Challenges and Advice to Complexity Science from the Practitioners"
<i>12:45 - 14:00 Lunch time</i>	
Slot 3: 14:00 - 16:00	
14:00-14:20	Findings from Group Work Session 1
14:20-15:00	"Embracing Complexity and Innovation to Deliver Business Growth" - Dave Palmer, Phrazzle Associates / Institute of Directors, UK.
15:00-15:40	"Trans-disciplinary working - Bridging the Gap between Practitioners and Complexity Scientists" - Dr W H Erik de Man, The Netherlands.
15:40-16:00	Introduction to Group Work Session 2 - "Addressing the Challenges - putting complexity to work." - Lucian Hudson, Collaborative Strategies Network, UK.
<i>16:00 - 16:30 Tea + posters</i>	
Slot 4: 16:30 - 18:00	
16:30-17:30	Group Work - Session 2 - "Addressing the Challenges"
17:30-18:00	Findings from Group Work Session 2 - Decide Follow-on actions for White Paper, Close Workshop.

16. Introduction to the Workshop. The facilitators introduced the Workshop and the Complexity principles mentioned above. This presentation, which also includes a summary of the techniques described in the next paragraphs, is available at: www.abaci.net/library/eccs01_introduction.pdf.

17. Techniques for Group Work 1 - World Café (morning). The 'World Café' technique was used in the morning. This enabled the participants to discover the issues and challenges through sharing experiences and then formulating a list of challenges and considering what advice they would give to Complexity Scientists. The World Café activity is about setting up conditions conducive to discovery. To do this, the facilitators changed a conventional lecture room into an informal café-style space, providing tablecloths to write on (with pens provided) and an area of wall covered with paper on which participants could display material of general interest ("The Wall"). The Group Work activity then proceeded as follows:

- a. Groups of 4 people had three, 20-minute conversations as follows:
 - *Chat 1*: they shared and collected their experiences, then nominated a host to remain while the rest formed new groups;
 - *Chat 2*: the host then explained what had been talked about (but did not have to defend / speak for the previous group). More insights from individual experiences were collected - the aim was to foster 'cross-pollination' and the connection of diverse perspectives. Then people returned to their original groups;
 - *Chat 3*: Involved listening together for pattern and deeper questions - which were captured, along with the collective insights as 'Challenge Topics' on a 'Sticky Note' which was put on The Wall (topics were grouped where relevant);
- b. Lastly, the content displayed on The Wall was reviewed.

18. Comment on The World Café approach. The World Café dialogue embodies the idea of the harnessing 'conversations that matter' as the basis of the shaping of collective intelligence from which innovations and new ideas emerge.

- a. The World Café process is described in "The World Café. Shaping our Futures through Conversations that matter" by Juanita Brown and David Isaacs (Berrett-Koehler Publishers, 2005). The following seven principles underlie the World Café design:
 - Setting the context – clarification of the purpose for the learning event, invitation of participants with a diversity of thought and experience, clarification of the learning approach, resources and follow up;
 - Creating hospitable space – creation of social space and information space in a physical space (see Figure 3, in this case by re-arranging the room, adding flowers etc and playing 'World Music' in the background while the participants arrived in the room in the morning);
 - Exploring questions that matter – asking powerful questions that spark innovation
 - Encouraging everybody's contribution – Focusing on contribution rather than ('I') participation creates a relationship between the 'I' and the 'We' for the co-creation together as a community;
 - Cross-pollinating and connecting diverse perspectives – moving people and their perspectives for the emergence of collective intelligence and ideas;
 - Listening together for patterns, insights and deeper questions – drawing individual differences into a meaningful whole;
 - Harvesting and sharing collective discoveries.
- b. In practice these principles, around a café setup and atmosphere, translate into variations of innovative ways for creating space, exploring ideas, inviting the contribution of everybody, sharing of insights and capturing the discoveries. The World Cafe approach seemed ideal for this particular Workshop group, as participants were either scientists or practitioners and represented a variety of disciplines from different levels of decision-

making. The diversity of ideas that each participant contributed from their own experiences enabled the groups on the tables to build on these ideas, adding understanding from one's own perspective to create new insights.



Figure 3: World Café - the Lecture Room before and after.

c. The sharing and exploring of the ideas between the different tables in a second round of discussions led to a deepening of the insights gained when participants came back to their original table. In this way, a coherent set of challenges emerged. The paper tablecloth played an important role in the dialogue as participants were invited to document and capture discussions on the tablecloth in text, diagram or picture form. All the challenges and insights that were raised concerning dealing with complex realities were captured on coloured cards and stuck onto The Wall.

19. Techniques for Group Work 2 - Think Tank (afternoon). An accelerated problem-solving / 'Think-tank' technique was used for Group Work 2. This creative collaboration enabled the participants to explore approaches to address the challenges identified in Group Work 1. A secondary aim was to develop 'common ground' - through displaying representations of participants' understanding on 'The Wall'. These representation were largely captured in the form of 'Fish Bone' diagrams like the one shown in Figure 4 as well as in drawings on the table cloths. The method used for Group Work 2 was as follows:

- a. Firstly, the participants formed groups of three people for 15 minutes: they selected a 'Challenge Topic' and took its card from The Wall.
- b. In their Think Tanks they then made suggestions about approaches to deal with the issues - considering what might enable or inhibit potential solutions. They captured their

suggestions on a large 'Sticky' (in narrative form or as a 'Fish Bone' diagram) - and placed the Topic and their suggestions back on The Wall.

c. They then formed another group of three for 15 minutes, took another Topic and repeated the activity.

d. There was then an open session to review progress.

e. In the final activity they went to the Topic that interested them most and formed a team to start to work on more detailed 'solutions'.

Example 'Fish Bone' diagram

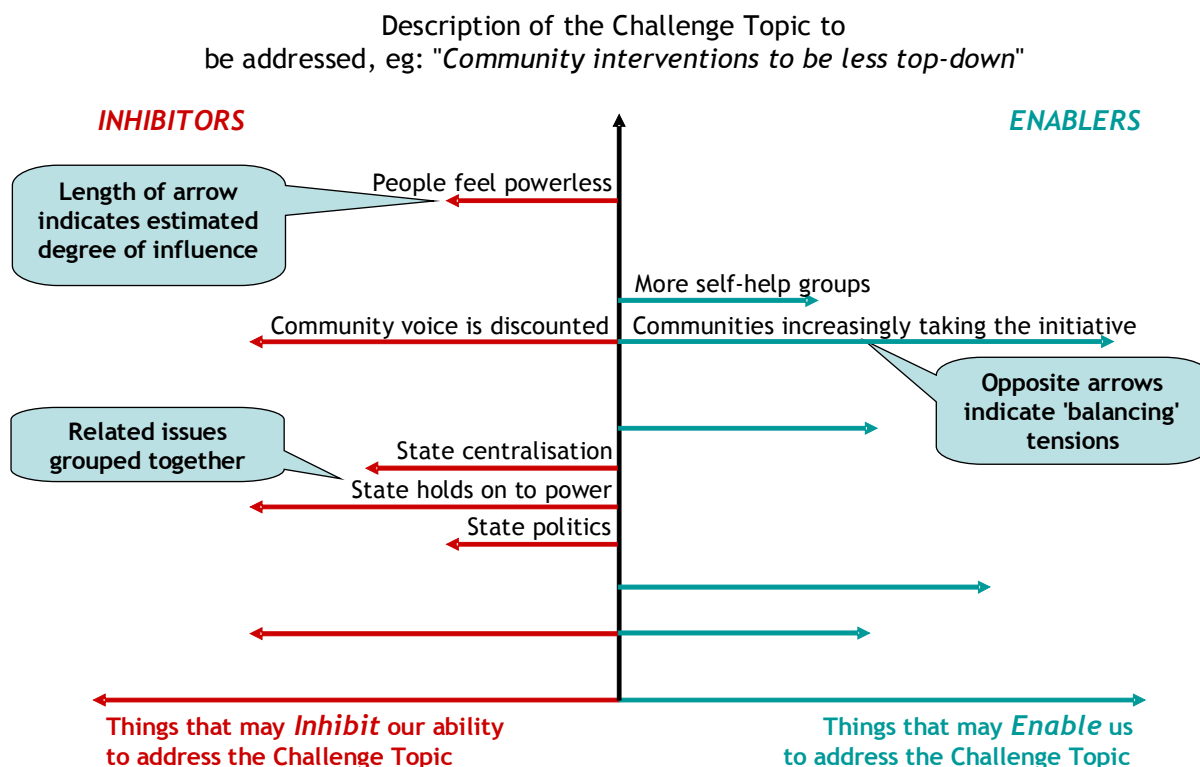


Figure 4: Example of the Fish Bone diagrams used to Capture the Issues.

20. Note on the Facilitators. The Workshop was facilitated by Patrick Beutement and Christine Brönnner of The *abaci* Partnership LLP who have considerable experience and a track record of running high-profile workshops with practitioners from across the world. See Annex H for more details on *abaci* or go to www.abaci.net.

SECTION 3. GROUP WORK 1 - CHALLENGES FOR PRACTITIONERS

21. The aim of the morning session, Group Work 1, was to converse and explore the Workshop participants' shared experience of 'putting complexity to work' - this activity was about discovery. The participants were asked a specific question as follows:

- a. The *Question to Address* was: "What are the challenges you have faced and which insights you have gained from dealing with complex realities in your day-to-day work?"
- b. The *Objectives* of the session were then to:
 - share own experiences of dealing with complex realities as a Practitioner (or as a private individual) - making notes on the tablecloths provided;
 - gain better understanding of each others appreciation of the challenges;
 - identify common themes / issues and capture them on "The Wall" (an area covered with paper so people could draw on it - photos available on request).

SUMMARY OF GROUP WORK 1

22. As the World Café method was used, there is little tangible 'output' other than the video recordings, the Challenge Issues which were posted on 'The Wall' and the notes and diagrams written on the tablecloths during the discourse. These have been captured and ***the output from group Work 1 is summarised in Annex E*** which contains:

- A list of the issues identified during the discussions;
- 'Tidied-up' versions of the drawings written on the tablecloths.

23. During the lunch-break, the facilitators observed that the "Challenges for Practitioners" issues that had been raised fell into the following thematic groupings:

- a. What is Complexity, how do we recognise it?
 22. Perceiving, recognizing and understanding complex situations;
- b. Limits on analysis, modelling and verification of complexity:
 - Is complexity computable? If not, which techniques / tools are appropriate?
 - Quantification and validation of models and tools.
- c. Enabling effective communication and collaboration:
 - Communication, language and negotiation in complex contexts.
- d. Diversity of views and perspectives:
 - Working with a wide range of 'behaviours' across stakeholders and actors.
- e. The effects of feedback, failure and learning:
 - Social phenomena that underpin collaboration and purposeful activity.
- f. Dynamics of structures and organisations:
 - How to create nurturing organisations?
 - Government (Institutional) structures are inhibiting - what are the consequences?
- g. Practice - how to effect self-sustaining change:
 - How to deal with (perceived) complexity and change?
 - Putting things into Practice - issues to address, tools required etc.

These Themes were used to help structure activities in the afternoon Group Work 2 (which are discussed in the next Section).

SECTION 4. GROUP WORK 2 - ADDRESSING THE CHALLENGES

24. The aim of the afternoon session, Group Work 2, was to begin to consider how to address the issues raised in the morning - the activity was about developing and exploring options - but in a 'quick and dirty' manner.

- a. The participants considered the following question: "What are your suggestions for addressing the Challenge Topics on The Wall?"
- b. Their objective was to collaboratively examine each of these Challenge Topics raised in the morning session and:
 - (1) Identify suitable approaches, changes and transformation issues to address them, such as:
 - things which are common, crucial, controversial;
 - bottle-necks (inhibitors) and opportunities (enablers).
 - (2) Capture and add potential approaches to The Wall.
 - (3) Begin to build teams who might take things further.

SUMMARY OF GROUP WORK 2

25. The ***output from Group Work 2 has been collated in Annex F*** which contains:

- A review of each of the Issues and the discussions surrounding them; and
- A version of each of the corresponding Fishbone diagrams; and
- Transcripts of some of the discussions which occurred at the various tables - this material supports the issues and insights which were collected.

Please note that ***the further analysis required to develop the interdependencies between the Issues further is beyond the scope of this document***. However, as each of the Issues have been reviewed, obvious connections have been indicated.

26. As mentioned in Section 2, each Fishbone diagram represents the issues in relation to one Challenge only. Though the Fishbone diagrams are a static representation they do capture some sense of the necessary tensions, dynamics and influences surrounding an issue.

27. Analysis of both sets of Group Work are provided in the next section.

SECTION 5. ANALYSIS AND DISCUSSION

28. The purpose of this Section is to analyse², collate and summarise the insights from the Workshop to bring out the key themes. These themes highlight the range of issues to be addressed if the 'Complexity Community' is to better tailor their insights to provide practical, relevant support to Practitioners. Where possible, in relation to addressing and an issue, the analysis will indicate: the realities to face, the mindsets required, the enablers, pitfalls, myths and inhibitors arising and gaps and opportunities in approaches, tools and methods suggested.

ANALYSIS OF ISSUES IDENTIFIED

29. The ordering of topics below is based on that identified in the Group Work.

30. Complexity:

a. The way in which people perceived, recognised and understood complex situations was diverse and thought to depend largely on their mindset, background, assumptions about the World and the context of the task on which they were engaged. Observations were made about the way people dealt with 'Complexity Science' and that there was a tendency to feel that they have to relate things to complexity science - regardless of relevance - as this seemed to give views 'authority'.

- Complexity Science should both acknowledge this diversity and consider how a systematic way of 'categorising' *perceived complexity* could be developed so that practitioners can better match strategies and techniques to the changing situation.

b. It was felt that people largely 'induced their own complexity' - owing to the various organisations, languages and abstractions and contrivances created - yet we didn't know how to 'make sense' of it. Also we lacked pragmatic large-scale 'whole-system' understanding - including how to engage with it at macro level in the real world.

- Complexity Science could assist practitioners by working with them in identifying appropriate ways of engaging with and influencing different types of complex phenomena - a 'symptom-sorter' approach might be helpful here.

c. Moving from linear to non-linear thinking was a challenge. There was a 'Fallacy of Linearity' in that, in the hierarchy of intellectual leadership, one is perceived as more robust if one thinks linearly. Yet, humans naturally think in complex organic ways, do their 'best' to work in that context and, in fact, this is more robust.

- Complexity Science could assist practitioners by providing more rigorous justifications and practical 'case studies' demonstrating (in terms that institutions / managers etc would understand) the value added by adopting 'common-sense-inspired' complexity thinking and engagement techniques.

d. The workshop facilitators noted that, among the practitioners, there seemed to be a drive to 'translate' the complex realities that they perceived into complexity theory. This was unnecessary as they understood these issues very well in their own context and on their own terms.

- Complexity Science should be aware that it may only be able to describe real-world situations at such an abstract level that this may not add value - indeed

² It is not the intention of the analysis to critique what was said or in any way make 'corrections'.

making an inappropriate translation into 'complexity science' might impoverish understanding.

31. Limits on analysis, modelling and verification:

a. Participants discussed whether complexity was 'computable' and, if not, which techniques and tools would be appropriate. Computability was complicated by the variety of boundaries, levels / nestings, scales (eg, in time and space) that had to be embraced.

- Complexity Science could assist practitioners by being clearer about the assumptions, constraints and limitations underlying models and by helping practitioners understand the consequences of these factors.

b. Discussion also took place concerning the quantification and validation of models and tools. It was felt that part of the problem here was the mindset / language used. It was usual to talk about "optimum", "validate", "prove", "targets" etc, but the language of "success and failure" needed to change to one which recognised the nature of complex environments. Also, the drive to "quantify at all costs" created distorted perceptions - it caused people to look for inappropriate indicators and give 'wrong' significance to events.

- Complexity Science could assist practitioners by helping them to develop sets of indicators and metrics which were more appropriate for the various kinds of interventions they may employ / types of complex phenomena they may face.

32. Enabling effective communication and collaboration:

a. In discussing communication, language and negotiation in complex contexts, participants felt that developing common ground among 'communities of interest' involved in collaborations in specific contexts was important. Metaphors could be helpful in this respect, though they could become 'tired' if over-used.

b. It was also recognised that there were many 'domains of discourse' to be accommodated (eg, directing, ordering, agreeing, influencing).

- Complexity Science should recognise this diversity and assist practitioners in developing alternatives to 'standardised taxonomies' - to ones which were extendable to make them relevant to the shared context.

33. Diversity of views and perspectives:

a. It was recognised that dealing with complex realities required that the diversity of perspectives, views and behaviours across stakeholders and actors be accepted and employed. In addition, trust, emotion and ethics were important factors in the work of practitioners and must be factored-in to any analysis.

b. A key impediment here was whether these factors were knowable / collectable from the real-world to the degree demanded by science.

- Complexity Science should examine ways in which these 'social intangibles' can be better reflected in their work such that more appropriate science can be made available to practitioners.

34. The effects of feedback, failure and learning:

a. An aspect which was extensively discussed in various contexts was how feedback, failure and learning in organisations came about - and, as a result, how you would set out create 'nurturing organisations'.

b. This topic related to most of the others previously summarised, covering issues such as: fostering trust (as this provided a space for negotiation), leaving space for 'error' (ie, active learning), engendering and recognising the value and utility of 'informal' (human-scale) interactions and adopting appropriate mindset and language (eg, of respect, recognition, power, punishment and reward) were all important.

- Complexity Science could improve its support to practitioners if it can demonstrate its ability to synthesise its insights across these transdisciplinary challenges - this means taking current 'single-issue' solutions and identifying necessary interdependencies with other relevant factors.

35. Dynamics of structures and organisations:

a. Another item of extensive discussion related to the way that governmental (Institutional) structures are inhibiting the human-scale activities of concern to practitioners. Being able to demonstrate clearly the (potentially damaging) consequences of this to policy-makers and managers was seen as being important. The participants also discussed different types of institutional, organisational and social forms, how they related and how they might morph / transition between them and what their lifecycles were.

b. Many of the key factors were identified at the Workshop (institutional structures too rigid, views of the world too mechanical etc), but it was felt that defensible alternatives needed to be offered. The most important aspect was how these formal structures related to the 'informal' social forms - which were often (wrongly) dismissed as insignificant.

- Complexity Science could work with practitioners to develop these alternatives, including both explaining rigorously why certain organisational forms were inhibiting and being able to demonstrate why better strategies, approaches, tools and techniques would result in more effective outcomes in complex situations.

36. Practice - how to effect self-sustaining change:

a. At the heart of 'putting complexity to work' was how to deal with (perceived) complexity and change. This including achieving better understanding of how change came about, how to understand, engage with and influence it. The metaphor of a fast-flowing river (as described in Annex B) was found helpful as it expressed clearly the need to be able to influence on-the-fly - where there may not be time for extensive 'planning'. A related issue concerned who was in the best position to achieve change - that it may not necessarily be the person formally responsible - and so enabling initiative was important.

- Complexity Science could provide better understanding of the mechanisms underlying change and transition and help practitioners experiment with change through providing appropriate 'simulations' that help them understand what their options are. These should not attempt to be absolutely predictive / prescriptive models, but instead help inform practitioners' thinking.

b. The participants, at various times and places in the Workshop, discussed 'Putting things into Practice' - including issues to address, tools required etc. However, it became apparent that there was no systematic framework around which to assemble these suggested approaches and capabilities. In addition, it is hard to make hard-and-fast recommendations as many of the needs change depending on the context - what is 'right' in one situation may be inappropriate in another. Participants recognised that developments such as the Internet offered new ways for people to organise (ie, that simultaneously recognised commonality and difference) and that developing and fostering transdisciplinarity was a key capability goal.

- Complexity Science could assist practitioners by developing, with them, a more systematic approach to the selection of 'tools' which enabled things to be done differently to really 'put complexity to work'.

SUGGESTED FOLLOW-ON ACTIVITIES

37. As a result of the suggestions and comments from the Workshop participants the following observations / recommendations can be made, that:

a. ***The nascent practitioner / scientist community be fostered*** and expanded - preferably ***by engaging in a purposeful collaborative activity*** to achieve a specific outcome of value to practitioners such as:

- the development of a framework for analysing perceived complexity and / or
- having systematic approaches available for selecting techniques and tools - such as a 'symptom-sorter' for problem / solution matching in specific contexts.

b. ***Further work be funded in the field of education*** - to both:

- help leaders, policy-makers and managers be aware of alternative approaches (including understanding their defensible value and utility) and
- to support 'front-line' practitioners develop their portfolio of 'complex-reality-ready' techniques and capabilities.

ANNEX A. SUPPORTING MATERIAL

ACKNOWLEDGEMENTS

38. The organisers would like to thank:

- a. Professor Jeff Johnson for his support and for the sponsorship from the EU's ASSYST Programme.
- b. We would also like to thanks Professor Robin Ball, Monica de Lucena and Aude Exbrayat for their enthusiastic assistance with the organisation of this ECCS'09 Satellite Workshop.

ABBREVIATIONS

39. The following abbreviations have been used in this document:

AFP	Agence France-Presse
CRAG	Carbon Rationing Action Group
ECCS	European Conference on Complex Systems
GW	Group Work

REFERENCES

40. The following books / articles are recommended:

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ANNEX B. COMPLEXITY FOR PRACTITIONERS

CHARACTERISING COMPLEX ENVIRONMENTS

41. A Thought Experiment: Engaging with Complexity - The Fast-flowing River. Your task today is to navigate successfully down a fast-flowing river containing rocks, whirlpools, and long stretches of rapids. It's a race, other people are already out on the river - you cannot afford to be left behind. So, how do you approach this task? How do you engage with the flow? What are your options? Which are the most appropriate and why? Which skills and capabilities should you have? Actually, you are always on the river - why did you think you weren't?

42. The river is a metaphor for the kind of dynamic and complex operational environment we face when dealing with complex realities. Practitioners are tasked with engaging with the rapid flow of human activity and with influencing various institutions, groupings and individuals so that political, policy and societal aims can be met. So, how are they approaching this task? What strategies are being followed? Are there other possibilities? If so, what are they?

43. One approach to the river task would be to think you can stand on 'the bank' and carry out a systematic analysis of information about the river. This could involve looking first at the environmental aspects. You could then examine the components of the river - the location of large rocks etc and the nature of the water (temperature, density, composition etc). From these you could construct a model and stage purposeful 'test journeys' down the river to try to establish the 'optimum' route. Another approach would be spend time trying to predict how the race might turn out. But, of course, the flow of the river is unpredictable, so you can never be certain - and so which metrics would be appropriate? You really have to know how to deal 'on-the-fly' with the dynamically changing behaviour of the river . . . how to seize its opportunities.

44. That means you have to face up to being on the river - it's the only way to sense and engage with these emergent phenomena properly. You realise that you may lack some of the key capabilities required - you may have a boat (but if it's not a kayak - it is too big, slow and will be turned over and swamped if you launch it). In any case, you need the agility and expertise to act, sense and adapt successfully 'on-the-fly' to work with the complex phenomena which arise in such a dynamic situation.

45. You realise that some of the people on the river have been impeding you - but you can't detect how they are doing it. What can you learn from them? They are just 'ordinary' people, informally grouped. How are they coping without the same 'management structures' as you? They have different capabilities to you - how come that fits them so well to this environment?

46. You are full of questions. What is it about these complex situations that seems so hard to deal with? What is it about the systematic, planned approach you used that denied you the insights you needed to make appropriate decisions in complex situations? How much can really be analysed / planned in advance, how much just has to be done now (ie, can ONLY be done 'on the water') and how much historical data would be of relevance anyway? What is it about water's ability to reshape dynamically that is so hard to grasp? What do we need to do differently to appreciate the qualities of the river and turn them to people's advantage?

47. Challenges for Practitioners. The river example above is more than 'just' a metaphor for the kind of dynamic and complex operational environment we face in real life - it also hints at the kinds of challenges that face decision-makers and problem-solvers in these situations. In complexity terms, these challenges include the following:

- a. Having to deal with a range of real and perceived phenomena (from routine to chaotic) - discussed further below.

- b. Accepting the dynamic, 'always-on' and ever-change nature of the situation which we, as practitioners, are 'co-evolving with (ie, we cannot make a change without affecting both the situation itself and our place in the changing events).
- c. Understanding that phenomena, events, actors and objects 'self-organise' - in other words, structures and patterns will form spontaneously (even in ways we cannot ever understand) - regardless of whether we intervene or not.
- d. Coping with the non-linearity of events and phenomena over time - ie, that they do not always 'unfold' in a systematic way. This means that practitioners have to accept that most of these patterns, phenomena and behaviours are unpredictable - they are beyond the so-called 'prediction-horizon' and are, by definition, 'unknowable' with certainty.
- e. Realising that outcomes are best achieved by participation, ie that the people of the community are probably best placed both to understand the dynamics of their environment and to effect the changes required. This means accepting that 'externally imposed' interventions are not the only way to bring about the required change.
- f. Understanding the differences between 'closed systems' (such as a bicycle, which largely behaves the same way every time you use it) and open systems such as human communities. For practitioners, these 'systems' are totally different in the way they can be understood, engaged with and influenced.
- g. Accepting that most conventional notions of boundaries between things are false or, at best, mere contrivances to aid understanding. In practice, most of the boundaries do not exist and so the wider real-world influences result in so-called 'unintended consequences'.
- h. Applying common-sense with confidence is a virtue - just because something cannot be translated into 'complexity-speak' does not mean it should be discarded.
- i. Fostering constructive, 'cross-disciplinarity' collaboration - as this is really the only way to address the complex realities of the real world. This because neither one person, nor one group can assemble the understanding necessary to change the world.

A PRACTICAL DESCRIPTION OF COMPLEXITY

48. The 'Thought experiment' and list of 'Challenges' above provides a useful practical description which encapsulates the main elements of complex realities which are:

- a. An environment in which the phenomena occur.
- b. Interacting components with properties which enable them to 'sense', 'communicate' and affect each other.
- c. The existence of purposefulness and intent which changes outcomes away from being 'chance' events.
- d. The dynamic, emergent phenomena and 'stable' patterns which arise from the interactions among these elements and which are persistent enough over time to generate evolving networks of influence which manifest themselves as 'the river'.

49. Effective ways of interacting with these various complex situations have been developed in many domains, such as: medicine, personal relationships, politics, business, genomics, agriculture, health care, humanitarian aid, social and cultural engagement, local and regional planning and sustainable development. While these domains are certainly not free of unintended consequences, neither are people paralysed into inaction by a having a bewildering difficulty understanding what causes 'their' type of complexity.

50. What types of phenomena do we perceive? There are several different classes of phenomena which can be identified and their different characteristics can be clearly described. Figure B-1 shows four of the main types of phenomena plotted on a 'Complexity Landscape':

- a. '*Routine Phenomena*' will be perceivable and repeatable and arise from simple, 'mechanistic' interactions which can be planned for and then appropriate structures / devices built (eg, the written constitution of the canoeists' club or their kayaks, clothing and equipment). Defined processes and procedures (eg, 'how to paddle') fit in this group. Discernable change of these phenomena is easy to detect, 'slow' and expected.
- b. '*Predictable Phenomena*' are complicated, but are potentially deducible - they can become Routine after suitable analysis. Generally, how the phenomena come about is understood - rather like playing a game with fixed pieces, rules and board - even if some of the moves are hidden at present (like the canoeist's Eskimo roll, it may not always come out quite right). These are probabilistic activities understood through discovery - where perceivable change tends to be manageable.

A Landscape of Realities

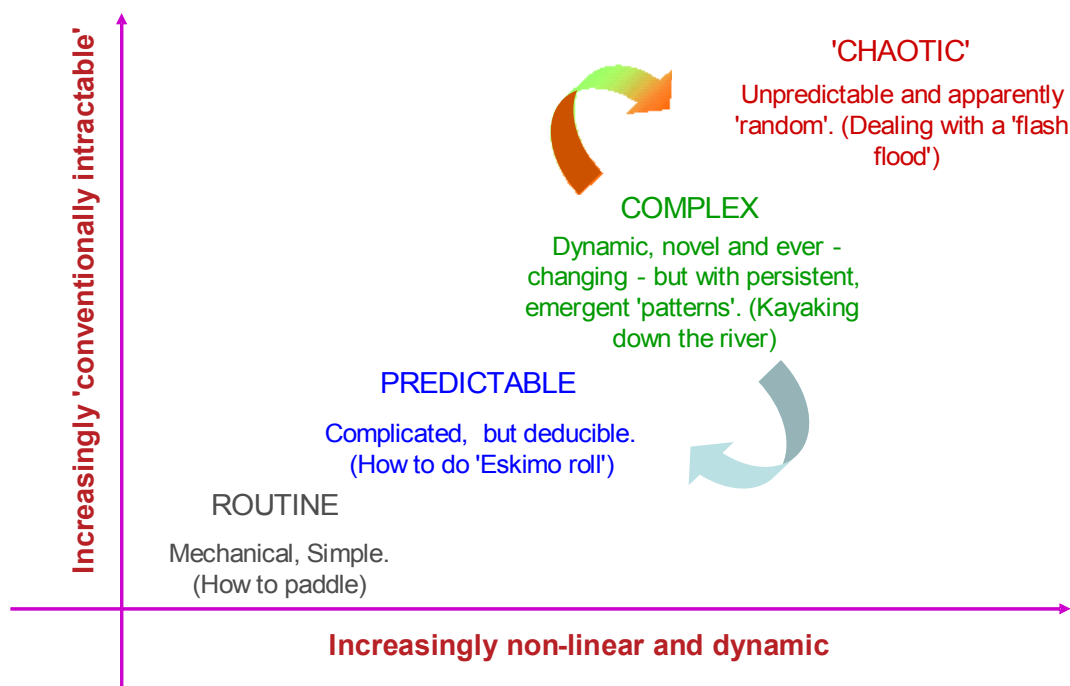


Figure B-1: Types of Phenomena on a Complexity Landscape

- c. '*Complex Phenomena*' are those which display the kind of dynamic emergence and unpredictability that concerns practitioners. Generally, they cannot be 'understood' in the formal 'let's gather the facts first' sense as they are always changing. However, patterns can be identified which may persist over time and these can be explored, influenced and exploited on-the-fly. Change here may be at any scale (micro to macro, or instantaneous to so-called 'long-wave' events). One must engage to sense - and what one senses is very viewpoint-dependant - it is then necessary to adapt to the realities which come to light. Usually there is little time to think about how to carry out the adaptation - it is about having an 'agile stance' which enables behaviour to 'flip' to new forms at minimum cost.
- d. '*Chaotic Phenomena*' are turbulent and unconstrained - and seem especially strange because one has no frame of reference. They are not, as often thought, totally unformed, 'destructive' and 'random'. Change (if discernable at all) is so fast, transitory and unexpected that we would say "There is chaos here" (eg, a ship on fire), yet chaotic phenomena do have underlying 'regularities' and these *can* be accessed.

e. '*Disorder*' There is a fifth (little-mentioned) kind of 'un-phenomena' called 'disorder' (or unorder³ as it is sometimes called) which can occur anywhere at any time among any of the other phenomena. Many transitions benefit from going via the unordered state, because all bets are off and all possibilities are there for the taking.

Though the characteristics of these types of complex phenomena in the Figure are 'caricatures', they have discernable features which can be influenced (discussed below). Also, these types do not sit in isolation, they are part of a continuum - so there is no guarantee of smooth, predictable transitions between the types which are, after all, no more than 'pen pictures' to aid our thinking. Most importantly, these are not 'passive' situations which wait for us to do things to them - we are actively co-evolving with the phenomena as we 'observe' them.

51. Some Practicalities for Practitioners. Dealing with complex realities should not be about having to respond after the fact, it is also about the ability to exploit complexity purposefully - to bring about self-sustaining transitions - ideally so that what is already there (or nascent) reorganises itself to exhibit the required behaviour. To summarise the insights from above:

- a. You cannot move faster than the current dynamic allows without causing (potentially counterproductive) dislocation - undermining the self-sustainability we seek.
- b. If you understand / know the class / type of phenomena you are dealing with, you will be able to select from a range of options for influencing, shaping and seeding that type of emergence - so that what you want is more likely to come about.
- c. There are lots of phenomena available 'for free', so, part of the job of practitioners and communities is to look for these and turn them to advantage. As this is often about grasping fleeting opportunities, 'permission' to use initiative needs to be given as this can be disproportionately effective (as in the 'tea-lady' who turns up at a key moment).
- d. Many things can only be achieved through third parties (individuals, groups, the environment itself etc) so, sometimes 'letting go' gets results. It is a mistake to think that if you do not do it, then it will not happen. The truth is that it probably is going to happen anyway - just not as you would prefer.
- e. Ordinary people have a stake in the outcomes; they will want to know that things are in their interests too - on their terms, valued in their way. They may want other transitions to occur. People will not be honest with you when the power / hierarchy / expectations / structures put them in a subordinate / weak position - 'participation' will set off on the wrong foot under these circumstances.
- f. Once local structures / dynamics are broken, they cannot be imposed from the top (as they would be an arbitrary set) - they have to arise from the bottom, which may take months or years to engender.

For more on these topics see [Chambers, "Revolutions in Development Enquiry", Thompson "Organising and Disorganising" and the *abaci* publication "Putting Complexity to Work - a Handbook for Practitioners"].

³ This is an ambiguous, yet still influential situation of being simultaneously neither ordered nor dis-ordered (somewhat fancifully likened to the 'undead' in films) and so in a 'quantum' state of unbeing.

ANNEX C. SPEAKERS AND ABSTRACTS OF PRESENTATIONS

This Annex contains abstracts of the presentation given by the invited speakers at the Workshop. Their presentations (except Robert Holloway's) can be found online at the links shown below).

ROBERT HOLLOWAY: DIRECTOR, AFP FOUNDATION, FRANCE

"Practical Complexity - Do we know what we need to do?"

Robert Holloway's talk described the real-world complexity on which journalists had to report and also provided anecdotes about the challenges facing journalists (from a wide variety of ethnic, religious and political backgrounds) when they collaborate together.

At the outset of the talk Robert posed the questions: "What is Information, how do we get it, what do we do with it?". No change which corresponds to a desired objective can be brought about without information. Most of us get information beyond our immediate neighbourhood from Mainstream media.

The Media has a bad press: it is seen as occupying itself with trivia, in a simplifying and superficial way. Accusing the press of simplification is not justified: the media has to create a coherent narrative out of elements which are disparate, sometimes unconnected, even apparently contradictory - this is what a journalist does. Behind simplification is a complex set of procedures and practices. News, by definition, is unpredictable - even routine events contain often unpredictable elements which tend to define the event.

AFP is training journalists in Third World Countries. It only uses practicing journalists as teachers. People work in their own language but, as there are universal standards for journalism, one has to be very sensitive to the culture one is working in. One of AFP's Principles is that the ownership of training belongs to the people who are being trained.

Robert then discussed the media coverage of the Java Earthquake at the beginning of September 2009 to illustrate the Media Paradigm. In such a disaster communication lines break down, transport links are interrupted, people become scared and start propagating rumour etc. The Information needed after such an event is not just a rounded analytical picture. Rather it is information on the number of people killed, injured, medical support required, if the government is in control etc. The complexity of this particular task for the journalists was enhanced due to the fact that Indonesia is an Archipelago, a country with many languages and staff of different backgrounds.

Robert finished by describing some of the complexities that journalists face in the real world and he used the example of a course on 'Peace Journalism' that the AFP runs Lebanon on behalf of UNDP. The Lebanon is described as a complicated society with 15 registered religious communities (represented at different levels of society) and a weak State dominated by 6 strong family groups (who wield more power than the State). The course was run in the end under the title 'Objectivity in covering conflict'. Robert described how one diverse group of trainee journalists created group solidarity and used this to develop improved cross-community reporting - despite threats and dangers.

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EILEEN CONN, LIVING SYSTEMS LTD

"Community Engagement – a Social Ecosystem Dance"

Eileen Conn's talk (see www.abaci.net/library/eccs03_eileen-conn.pdf) presented a novel model which clearly illustrated the complex dynamics of community engagement between Government and 'The People'.

Eileen's model showed how, when community engagement was directed in a top-down manner, then the Government makes the (false) assumption that Communities will have an institutional structure similar to its own with which it can interact on its own terms.

In reality, there are several types of actors involved, each with their own type of organisational form and behaviours. For example, the Public and Voluntary sector agencies have one system, whereas the Community is 'organic' and so these two different social systems are interacting in a way that creates complex behaviours and social and organisational dynamics. Public and Voluntary sector agencies are ill-equipped to deal with these dynamics and attempt to impose a 'unified' view of the world based on the reductionist approaches that they use.

Eileen pointed out that these external / public agencies have a vertical hierarchical system of relationships, whereas Individual residents and the community have largely invisible horizontal, peer-to-peer, relationships. These differences will not be apparent to institutions using traditional procedures - whereas, if they changed their approach they would become aware of the differences and realise that these open up new possibilities.

Eileen illustrated these issues using a visual model which both indicated what would need to change to enable more effective engagement and which acknowledged and addressed these incompatibilities.

Communities, and the social eco-system they inhabit, are complex living systems which need to be nurtured. Community development is needed for the horizontal peer system, but this cannot be directed to happen from within the vertical hierarchical system.

Eileen concluded by pointing out that Community empowerment must be an end in itself as, when this is achieved, the structures will be in place to support effective community engagement with Government and institutions.

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ANNA PLODOWSKI, PECKHAM POWER PROJECT

"Peckham Power – can Complexity Tools help us?"

In this talk, Anna Plodowski (see www.abaci.net/library/eccs04_anna-plodowski.pdf) described in detail the challenges of setting up a Community-driven project from the bottom-up. In particular, Anna described the issues which arise when an 'interest group' attempts to re-organise itself into a more formally-structured voluntary body.

Anna explained that the "Peckham Power Project" is an Energy Infrastructure project for the communities in Peckham and Nunhead in the South East London Borough of Southwark. The project has its root in the Peckham CRAG (Carbon Rationing Action Group) which acted, with very limited success initially, to change behaviour in the community. However, they did succeed in generating support from a local councillor and in triggering some media interest.

The Councillor then suggested that a community-based micro-generation project be set up (especially Photovoltaic) for all in Peckham. This led to the Peckham Power Energy Infrastructure project being initiated.

At the outset the questions from those involved in the project were: "How do we describe ourselves?", "Who are we and who are our members?", "Do we know what we are talking about and can we communicate it to outsiders?".

Anna then described how, since the launch of the project, nothing had turned out as expected and she itemised many of the issues and challenges that had arisen such as:

- The relationships with each other within the project was complex, caused by the diversity of people – with different viewpoints, priorities and motivations. There was also lack of trust in each others expertise;
- The relationships externally proved challenging too - as these included other groups such as people in the community, local institutions, funding agencies, civil servants, energy companies etc;
- How to maintain momentum and / or focus (i.e What do we do next?). This involved embracing risks and developing an understanding of 'how we can get to where we want to be'.

Finally, Anna raised some questions concerning how complexity science could help to deal with these issues and invited the Workshop participants to offer solutions.

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DAVE PALMER, PHRAZZLE ASSOCIATES LTD

"Embracing Complexity and Innovation to Deliver Business Growth"

In his presentation (see www.abaci.net/library/eccs06_dave-palmer.pdf) Dave Palmer looked at the nature of complexity in the Business Context and also at how businesses tend to react to the complexity. Dave's talk then examined, systematically, the types of issues that arose and how they might be addressed by employing complexity-science-inspired thinking.

Dave described the internal (management and functional structure) and external (eg market forces, regulations) drivers of business complexity. He also examined various aspects of leadership and business culture and showed how these sometimes led to situations where there was an inability to deal with complexity.

Dave then showed the consequences of dealing with these factors inadequately - how they can seriously hamper a business in terms of its competitiveness, innovation capability, decision process flows, staff motivation and skills match. In addition, an inability to deal with real-world commercial complexity would lead to a company having a limited product portfolio where a diverse multitude of offerings would be required.

The talk also showed how complexity can offer benefits and opportunities to businesses. Dave picked up on these opportunities and challenges to the business community in more detail - especially on how to create vision and strategy in the business, identifying the nature of complexity within the business, skills development, creation of culture of change in the organization, the enabling of knowledge flows in the organization and handling the dynamic external forces that influence the business.

In conclusion, Dave requested cross-domain engagement to develop further the portfolio of complexity-inspired approaches, techniques and tools - but made available in the language of business, not of complexity scientists.

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ERIK DE MAN: THE NETHERLANDS

"Bridging the gap between Complexity Practitioners and Scientists. Thinking out-of-the-box"

In this presentation (see www.abaci.net/library/eccs07_erik-de-man.pdf), Erik de Man addressed the essentially trans-disciplinary nature of any attempts to deal with complex situations. Erik showed how much conventional thinking tended to draw boundaries and so partition the problem space in a manner that would break the beneficial aspects of complexity. In stead, he presented a carefully reasoned argument for a different approach build around 'transdisciplinarity'.

Erik pointed out that supporting complexity practitioners (ie, "putting complexity to work") is essentially a socio-technical activity. The background context for the presentation is the problematic relevance of Geographic Information Science (GI Science) - focussing on gaps between scientific and technical applications, and practice.

The presentation first briefly indicated major complexities and dilemmas in GI Science and how to cope with them. Erik then generalised these dilemmas to science in general and pointed out that bridging the gap between science and practice must be two-ways and in terms of the complexities and dilemmas at hand. It follows, therefore, that science is relevant for practice to the extent that it is able to acknowledge and reconcile the multiple complexities that exist in the real world. The main arguments of Erik's presentation were:

- Complexity within the 'recipient system' is adaptive and a source for robustness and change and must be engaged with in a complementary manner;
- Complexity scientists must take into account the complexity within the 'recipient system' and deal assertively the dilemmas that come with it;
- Rather than controlling complexity, it should be acknowledged as a much needed quality in its own right - which can be 'put to work'.

Erik then asked - what does this mean for "putting complexity to work"?

Firstly, the main question for Complexity Science is: How to keep and preserve the needed complexity and robustness of the 'recipient system'? Because complexity acknowledges multitudes of actors, this brings different, often conflicting realities and rationalities, and, hence, dilemmas to be dealt with.

Next, Erik proposed that 'transdisciplinarity' be used for bridging the gap between complexity practitioners and scientists because of its ability to acknowledge different realities. Mutual 'transdisciplinarity' requires both complexity scientists and practitioners "to think out-of-the-box", finding 'common ground', not commonality. This is not about choosing one or other, but about working around an 'inclusive middle'.

Finally, complexities and dilemmas are to be coped with rather than be solved. Hence, bridging the gap between complexity practitioners and scientists is more about continuous, joint learning-by-doing than by the application of theories. Both complexity practitioners and scientists are supported by this capacity to think out-of-the-box.

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LUCIAN HUDSON: CHAIRMAN, COLLABORATIVE STRATEGIES NETWORK

"Addressing the Challenges: Putting Complexity to Work"

The aim of Lucian's talk (see www.abaci.net/library/eccs08_lucian-hudson.pdf) was to pick up some of the common issues and themes that had come up during the day and addresses them in light of the changes to be made in, for example, the domains of Strategy and Policy, Economics, Leadership and Authority, and Culture, Ethics and Technology. These changes were required in order to change attitudes and behaviours concerning complexity thinking - leading to more appropriate engagement and intervention across society and the wider natural environment.

Lucian's presentation looked at three aspects of these changes:

- Embedding complexity-inspired tools for change such that they extend from analysis, through synthesis into 'everyday' practice;
- Developing mindsets which put human interaction at the heart of policy and which accept the 'citizen focus' as an essential part of achieving successful outcomes;
- Making evolution from existing ways-of-working possible, such that more holistic approaches can gain traction.

Lucian then went on to develop these themes through a number of examples and anecdotes drawn from various domains of endeavour. In doing this, he picked up on the 'transdisciplinarity' aspects of Erik de Man's talk, showing the interconnectedness of policy, commerce, community, science and technology and the wider environment.

He then listed some of the challenges facing the complexity community in supporting practitioners and described some of the roles they could play in bringing about change. These included:

- Helping to change the 'rules of the game' (as it is currently played) - ie, informing the change from current practices by offering alternatives;
- Explaining in practical terms the nature of what it takes to have effective interaction leading to better outcomes in holistic contexts;
- Showing how complexity-thinking offered novel and fresh opportunities to deal with previously intractable situations;
- Working with better ways of collaborating to facilitate change.

Lucian then developed the theme 'What is to be done differently' across human endeavour, providing insights and stimulus for the afternoon session of Group Work.

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ANNEX D. ATTENDEES

The following people attended and participated in the Workshop "Putting Complexity to Work - Supporting the Practitioners" held at Warwick University on the 24th September 2009.

Surname	First name / Title	Affiliation
Allan	Jeff	DRTS (Real-time systems)
Argyle	Paul	Flight Directors
Beautement	Patrick	The abaci Partnership
Boulton	Dr Jean	Complex Systems Research Centre, Cranfield
Broenner	Christine	The abaci Partnership
Bromley	Jane	Open University, ASSYST
Campbell	Alasdair	Niteworks
Cantle	Neil	Milliman Ltd
Cardoso	Pedro Pablo	-
Conn	Eileen	Living Systems Research, London
Dack	Lawrence	Telaugos Solutions
Dick	Peter	Department of Health
Gretton	Dr Jud	Complexity Solutions
Holloway	Robert	AFP Foundation
Hudson	Lucian	CSN
Jackson	Jennifer	Complexity Science DTC
Lloyd	Merfyn	DSTL
Lopez-Herrero	Silvia	Complexity Programme, LSE
MacKay	Robert	University of Warwick
de Man	Dr W.H. Erik	-
Marsay	Dr David J	QinetiQ
Martin	Prof. Carmel	NDRC, Dublin
Milburn	Trevor	Niteworks
Miles	Peter	Complexity Solutions

Surname	First name / Title	Affiliation
Neaga	Irina	Loughbrorough University - NECTISE Programme
Palmer	Dave	Phrazzle Associated Ltd
Penn	Dr Alexandra	SENSe Group, Southampton University
Plodowski	Anna	Peckham Power
Royston	Dr Geoff	Independent Analyst
Sutcliffe-Braithwaite	John	Metaloger project, (UoW Complex / Org / Systems Research Group)

ANNEX E. GROUP WORK 1: DETAIL OF OUTPUT

52. This Annex captures the material produced at the end of the morning session from Group Work 1. As the aim of the Group Work was to converse and explore the shared experience of the Workshop participants, there is little tangible 'output' other than the Issues posted on 'The Wall', the notes and diagrams written on the tablecloths to support the discourse and the video recordings (available on request).

53. Therefore, this Annex contains the following:

- A list of the issues identified during the discussions;
- 'Tidied-up' versions of the drawings written on the tablecloths.

LIST OF THE ISSUES IDENTIFIED DURING GROUP WORK 1

54. The issues, in rough alphabetical order are as follows:

- Complexity - how do you recognize it?
- Complexity, we have built our own but don't know how to 'make sense' of it / engage with it at macro level (large-scale 'whole-system' understanding).
- Complexity is induced by people and organisations and language and 'rationality'!
- Separate the Necessarily Complex from the Complicated and Simple.
- From linear to non-linear thinking. How? How to engage with non-linearity?
- How does the change happen?
- What is rightness in a complex situation?
- There is no right answer (whose problem anyway), there is just change (the journey).
- Which information is needed to deal with complexity?
- What is information? How to 'manage' information flows?
- Attention Span! Duration ['utility'] of information just 90 days, even 40 days.
- Dealing with complexity requires a strategy and vision, not a plan (short-term-vs long-term balance).
- Need common ground (not standard) language (negotiation of meaning relevant to the shared context):
 - How to adapt to changing narratives - trust provides a space for negotiation.
 - Formulation of metaphors and communication.
 - Reconciling different views - perspective of problem (level / scale):
 - Different cultures - what is the other to me?
 - How do we make room for emotion?
 - Ethics and Ethical Space: Does the application of complexity tools contribute to more ethical behaviour?.
- How do you communicate the usefulness and power of complexity models as distinct from the daunting notion of things being complicated?
- Controversy – are 'systems' computable or not? Which purpose?
- Whose systems? Which boundaries / level / scale / time-horizon.

- Validation and Verification: what is fitness for purpose? We need to stop thinking in a deterministic way – trial and error along the way may be better - mindset changes required:
- From optimum, validate, "Prove", etc: Change language of "Success / failure" to one which recognizes complex environment - adapt and learn.
- Idea of 'targets' need to adapt – Relationship between targets must be understood (Conflicts result from Complexity / ignoring it).
- Drive to "quantify at all costs" creates distorted perceptions - it causes people to look for inappropriate indicators / give 'wrong' significance to events.
- How can community groups learn and then act from success or failure here or elsewhere?
- Feedback loops are essential because of Dynamic Reality – what are the Real feedback loops? [See Table 7 diagram]
- Avoiding 'failures' in 'process' of communication (eg judgement is implicit in loaded language and specialists jargon) - but also building-in room for error in assumptions.
- How to produce nurturing self-organisation.
- Relationship between people and organisations – balance between management and empowerment:
- Multiple direction arising from different 'Government mechanisms' induces mechanistic responses, ie. constrains, judgement, innovation. Need to develop less mechanistic view of how people operate (eg "Machinery of government"!) so dialogue and engagement can occur - partnership - mutual respect of roles / functions.
- The perverse Results of Public Policy undermine government.
- Control <-- --> Self-organising behaviour: self-organisation initiatives are inhibited by the current environment ("big players")
- Government structures too rigid, ossified, clamped (Organisational "Glue").
- How do you plan to generate emergence? At what level do you put in structure / does structure arise?
- Forced stakeholder engagement and power issues (Employers and public organisations) versus empowerment and influence (individuals).
- What has to be done differently?
- How to avoid "Spinning wheels" and to do something in a community environment.
- Looking for uncontested spaces
- How do you know when leadership is required?.
- The dichotomy of successful collaboration: how do you successfully nurture the tension of communality and difference.
- New technologies – new ways to self-organise. Driven by GROUNDSWELL! (Often from youth – but should be from everyone).
- Different tools / tools used in different ways.
- Challenge: Try to get people to take a different approach and then actioning / delivering on it! Suggested solution:

DRAWINGS FROM THE TABLECLOTHS

55. The drawings are ordered by Table Number - key below (note that, as people moved around for the various stages of group Work, names have not been indicated against tables).

		[Screen]
	[Lectern at the Front]	
Table 4	[No table]	Table 1
Table 5	[No table]	Table 2
Table 6	Table 7	Table 3
Table 9 [Video team]	Table 8	[Doorway to corridor]

Table E-1: Key to decoding Table Numbers

TABLE 1

Reporting: perspectives of problem, level/scale of problem, languages – reflect complex dynamic.

News reporting: Only three global agencies – Requisite variety? – Countered by ‘Personal Journalism’ (Twitter etc.)?

Table 1

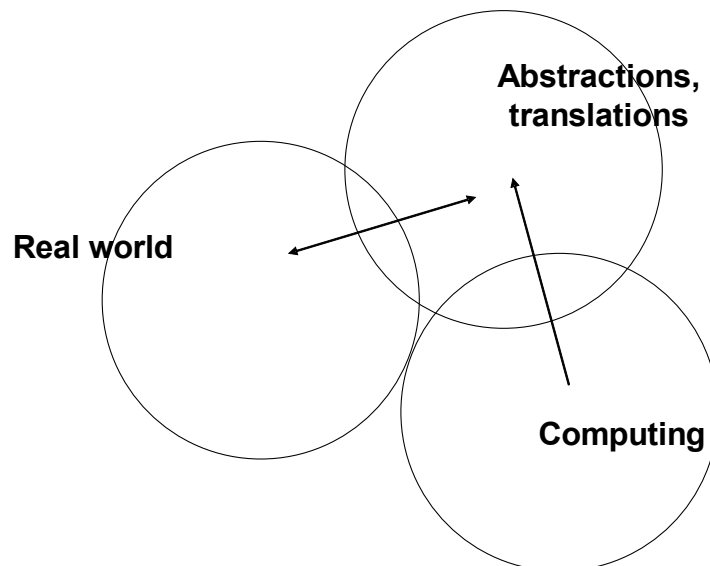


Table 1

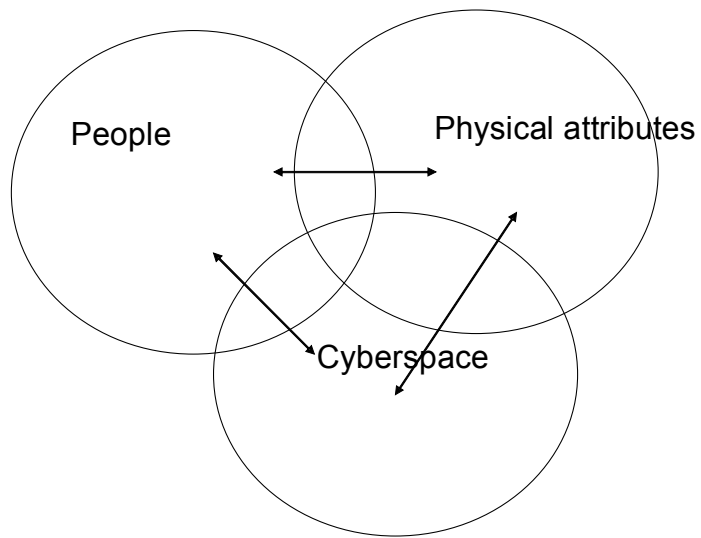


TABLE 2

Disruptive versus incremental.

Information or intent? Context and intention is everything.

Objectivity is an artificial concept designed to address the context in a defined metaphor.

Table 2 **Complexity - Powerful metaphors**

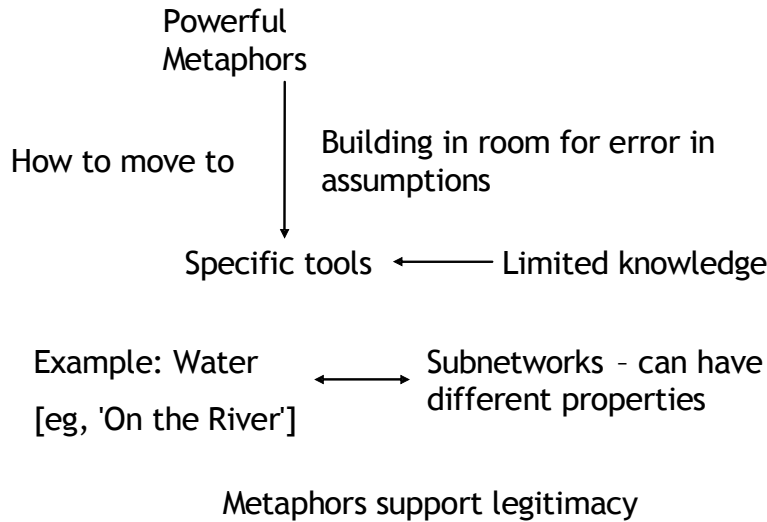
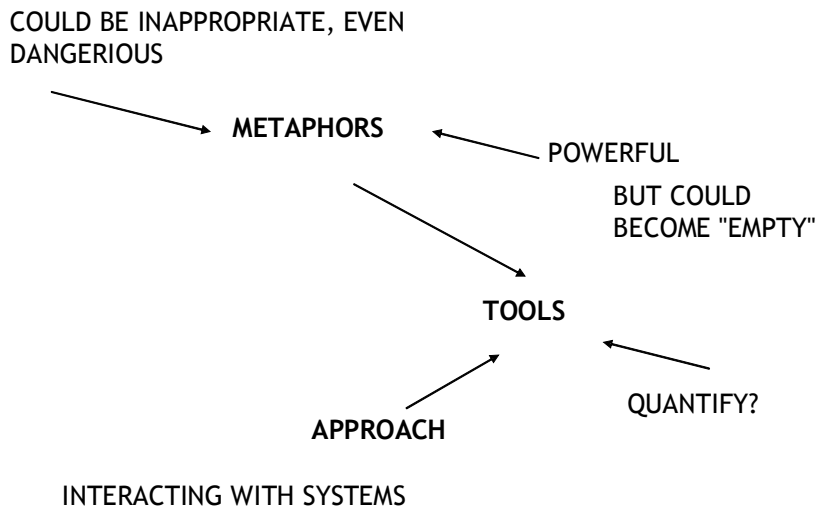


Table 2 **Metaphors - Pros and cons**



Dealing with complex systems problems often requires large – scale "whole systems" knowledge. How can the press provide this?

Not just science but people / group.

Barrier scientists << -- >> non-scientists.

Empty use of terms (eg "Sustainable Development") this is not just a trendy term.

Ossified structures – communication can become possible.

What is 'computable' about social systems? Many systems are not modellable - inbuilt assumptions may be wrong.

Accidents, even aircrafts or power stations are not computable: we don't have exact models: **The model *does not* = the system.**

TABLE 3

Look for uncontested space. Do something!

Networking: Searching for ideas in space of possibilities.

How to learn from others / elsewhere (eg, micro-generation projects).

Is like the analogy with car driving (drivers not needing to understand engines etc) an appropriate one with respect to Complexity science and practitioners?

Eileen's presentation: Missing sun? And rain?

- Perverse results of public policy!
- Commonality of interest / purpose?

How do you recognize complexity? More obvious when designing a strategy than in planning.

Difficulty in getting people to take different view of things as will be a cost of change

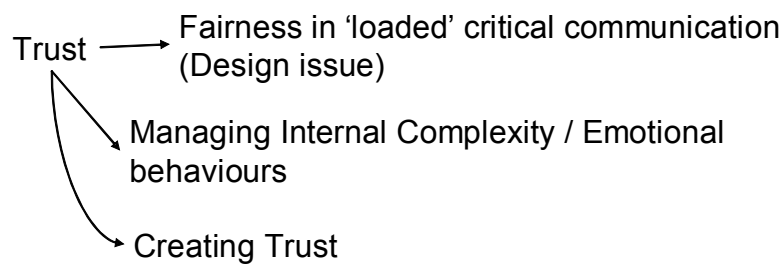
Prof. Carmel (?)

Table 3

Trust

Trust at least the process if not the person

Aware of inadequate [?trust]



Trust: Aboriginal / Ethical space for negotiation (White Flag)

Medics wanting to engage with community / Be healers, not mechanics

Leadership:

- Complex << -- >> Dynamic
- Complicated << -- >> Static, multifaceted
- Simple << -- >> single facet, dynamic (possible)
 - Facets?
 - Dynamics?

TABLE 4

Intuition versus training to know what's going on?

Initial narrative "wrong" – how to respond to that? And how can your audience cope with that? e.g. development of narrative.

Public spending targets [distort].

How make public authorities more nurturing?

Failed states – how deal with them?

TABLE 5

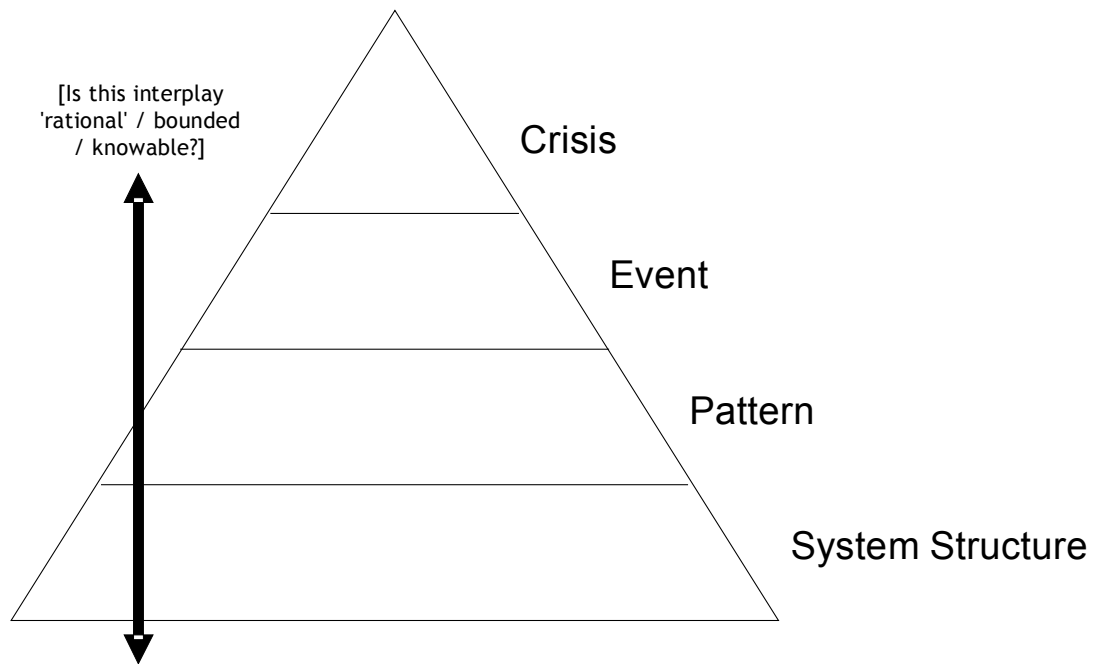
Models – Bottom up.

Negotiating meaning! Taxonomy?

Linear thinking = control?

90 days attention span → information timeout.

Table 5



Journalism: takes in info & creates narrative from it:

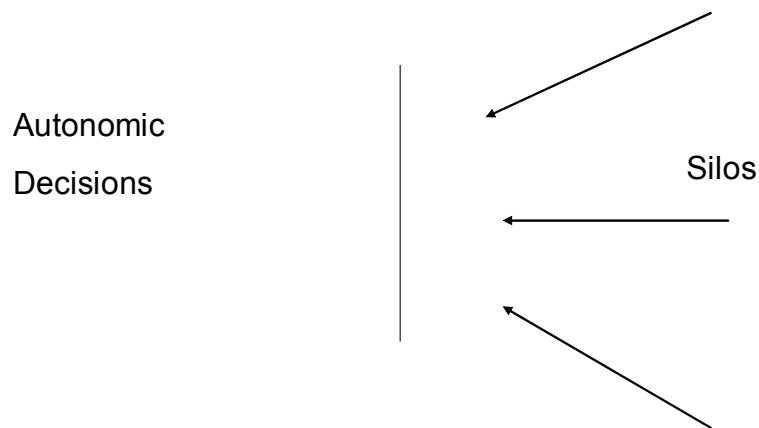
- Journalism = Unexpected event;
- Risk = Mining for unexpected event from info;
- How to manage information flows?
- Restructuring information networks;
- What is information?

TABLE 6

Reducing inappropriately the complex to the routine?

- Hierarchical control inappropriately applied;
- Simplifying the complex misses the fact that the issue / problem is the complex:
 - Complex reality – Dynamic reality;
 - Different cultures;
 - Need for common [ground in] language.

Table 6



Challenges: Complex reality:

- Understanding;
- Describing;
- What can be done?
- What is to be done?
- How can aim be achieved?
- How can the complex reality support the achievement of the aim?

TABLE 7

Robert's talk: Intuition versus Training:

Table 07 (Based on Robert's talk)



4 types of knowledge: Ideology?

Impact by Journalists?

Eileen's talk: "It has to be run as a control and command system".

Anna's talk: "Fuzzy language".

- Timing
- Individual versus group
- Ideology - ?External / ?Internal.
- Focus/ ?motivation /Inclusion

Regime and associated voluntarily.

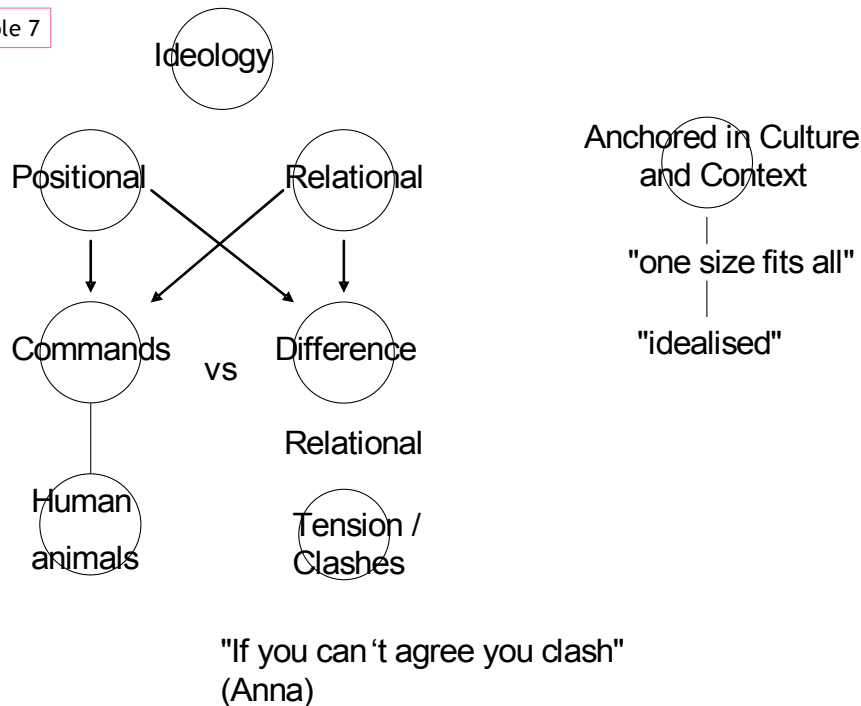
Hobbes / Rousseau. Hybrid systems: "warheads" can be pointed and round!

"Getting people to change view":

- validating existing point of view
- secondment /group visits
- alcohol / play

- collect stakeholders with varying views early, before you really know where you are going
- take action
 - move experimentally
 - without having to be right but with commitment
 - aiming to introduce comfort
 - with the concept of 'delivery' being a complex activity

Table 7



Problems for Complexity Practitioners: its not computable:

- If it exists [tangible] can do? If it doesn't, what then?

Parents, give control. Control stifles collaboration / creativity:

- We become emotional if creativity stifled. Passion is control;
- Ethics = permission to have a space / acknowle your emotion and equal value

Eileen:

- Control is all about deciding what is known / products-focussed, but no accountability.
- Life is unpredictable.

TABLE 8

Need:

- Metaphors (eg, structure of water) and tools;
- Computability + language + logic + rationality and assumptions;
- Bandwagon devalued.

Initiative – grit in the oyster.

Space of Possibilities.

Adjacent possibilities.

How to find space – formal / informal structures / www.

Eileen's Diagram does not include people at work.

Trying to get people to:

- Take a different view?
- Take action?
- Too complex?
- Creating delivery too hard?
- Cost of addressing complexity (perception): financial, time.

Research and Time:

- Cultures – Culture of groupings – Groups of people.

People + organisation - espoused and practiced.

What are we trying to achieve? – Objectives – framed in terms of deliverables – therefore ways part is not valued.

Complex problems are resolved by strategy which is more about ways than Ends:

- Strategies – direction;
- Plan – concrete objectives;
- Strategy – setting in context and language terms, issue, eg Peckham; eg, NHS, target setting - lowest common denominator;
- Vision – Clarity of Vision and coordination benefit strategy.

Leadership – Clarity of purpose – culture of mission command, but now follow rules, being accountable.

- Power and influence: hierarchical (enforce), horizontal (empowering)
- Language changes: objective, accountable.

What is rightness in a complex situation?

"Agents for change in complex situations":

- Media pressure for an immediate reaction / response sets off a concatenation;
- Perception of power;
- Fuzzy language to cover all bases?

Pedro Pablo Cardoso: Variety:

- In business terms?
- Value change;
- To know the amount of complexity in business;
- Measureables: measurability of complexity in organisation.

Dörner's "Logic of failure" highly recommended as reading.

TABLE 9

Table 9

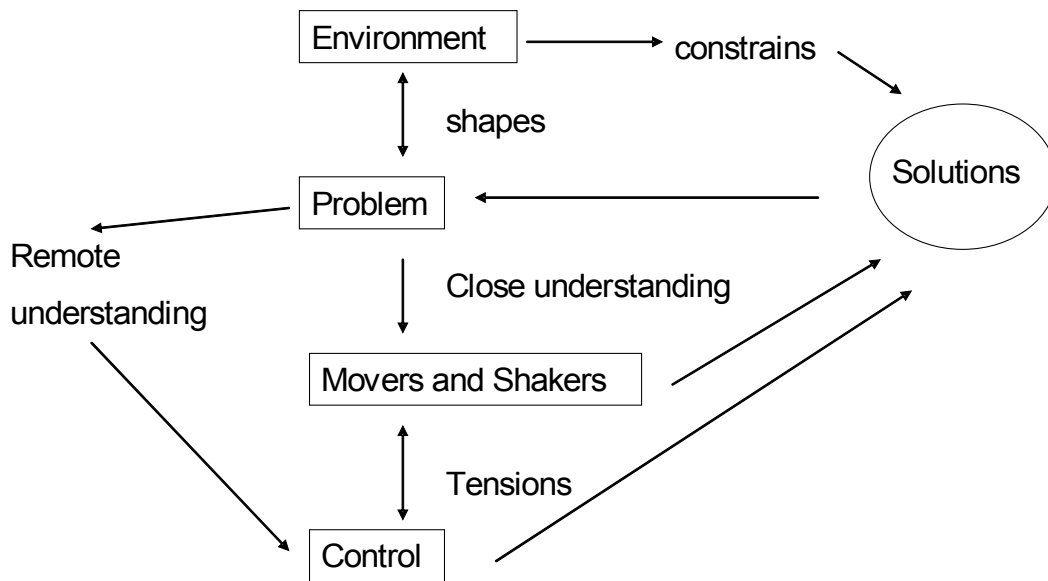
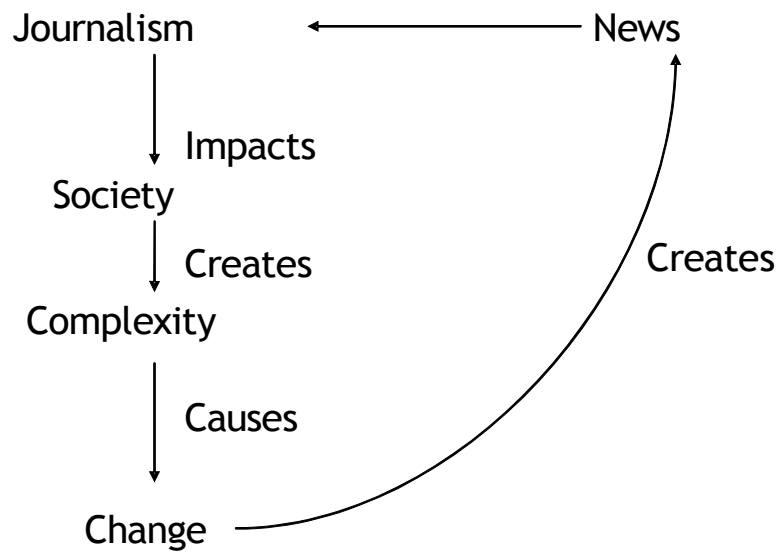


Table 9



ANNEX F. GROUP WORK 2: DETAIL FROM THE WALL

56. This Annex contains a transcript of the discussions which took place during Group Work 2, along with 'tidied up' version of the 'fishbone diagrams' that were drawn by the participants. This Annex is arranged by the themes identified during the session which are as follows:

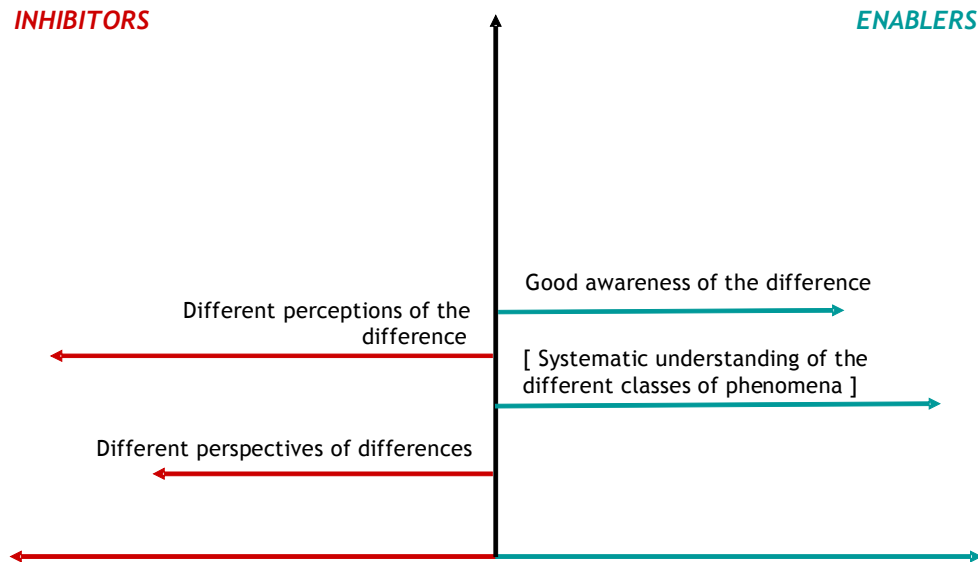
- Perceiving, recognizing and understanding complex situations;
- How to deal with (perceived) complexity and change?
- Communication, language and negotiation in complex contexts;
- Diversity of views and behaviours across stakeholders and actors;
- Is complexity computable?
- Quantification and validation of models and tools;
- Feedback, failure and learning in the organisation - how create nurturing organisations?
- Government (Institutional) structures are inhibiting, what are the consequences?
- Putting things into Practice - issues to address, tools etc.

PERCEIVING, RECOGNIZING AND UNDERSTANDING COMPLEX SITUATIONS

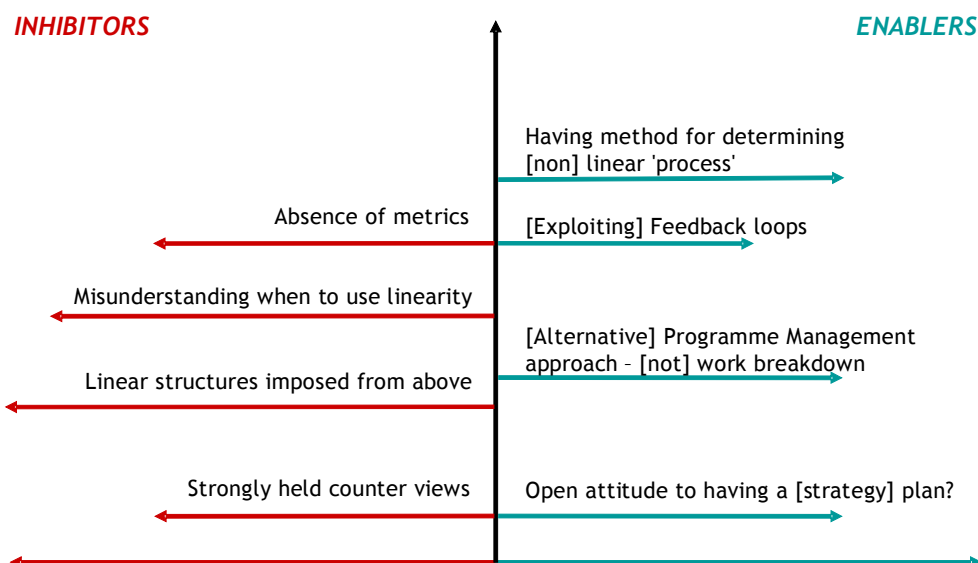
57. How do you recognize complexity?

- Not what you expected! [ie, need to examine mindsets and implied assumptions].
- We have built our own complexity – but don't know how to 'make sense' of it / engage with it at macro level (large-scale whole-'system' abstractions).
- Complexity is induced by people and organisations and language and 'rationality'!
- Separate the Necessarily Complex from the Complicated and Simple [See Fishbone below].
- From linear to non-linear thinking. How? How to engage with non-linearity?
 - The Fallacy of Linearity: In the hierarchy of intellectual leadership, one perceived as more robust if one thinks linearly.
 - Yet, humans naturally think in complex organic ways, do their 'best' to work in that context and in fact this is more robust. [See Fishbone below].

Separate the Necessarily Complex from the Complicated and the Simple



The Fallacy of Linearity: In the hierarchy of intellectual leadership, one is perceived as more robust if one thinks linearly. Yet, humans naturally think in complex organic ways, do their 'best' work in that context and in fact this is more robust. *How to engage with non-linearity:*



HOW TO DEAL WITH (PERCEIVED) COMPLEXITY AND CHANGE?

58. How does the change happen?

- What is rightness in a complex situation?
- There is no right answer (whose problem anyway), there is just change (the journey).
- Which information is needed to deal with complexity?
 - What is information? How to 'manage' information flows?
 - Attention Span! Duration ['utility'] of information just 90 days, even 40 days.
- Dealing with complexity requires a strategy and vision, not a plan (short-term-vs long-term balance) [See Fishbone below].

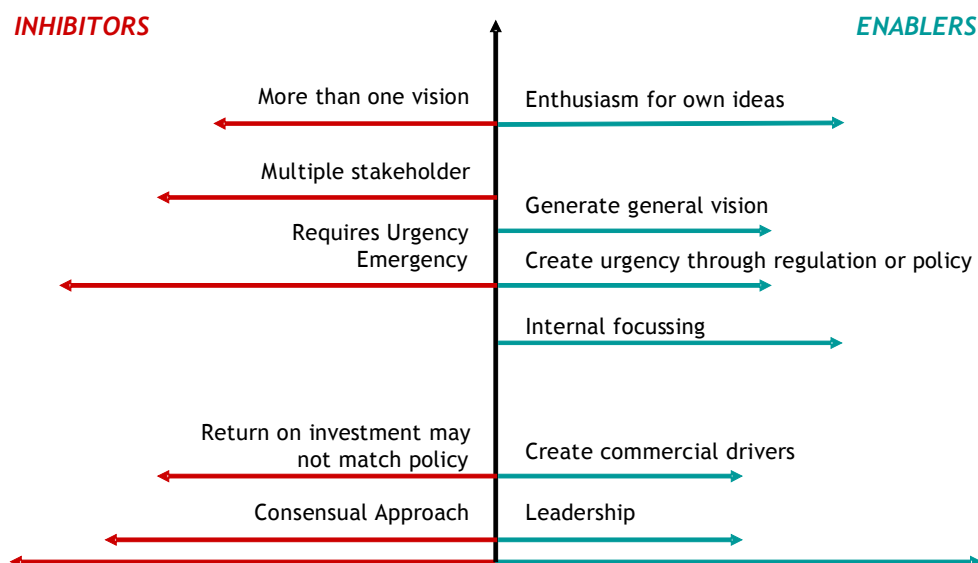
Table discussion of dealing with Complexity

Complex reality - dynamic reality. Reducing inappropriately the complex to the routine? Simplifying the complex misses the fact that the issue / problem is the complex:

- Understanding / describing.
- What can be done? What is to be done?
- How can aims be achieved?
- How can the complex reality support the achievement of the aims?

Erik: It is important to bring people together. At the beginning complexities are not clear. There is complexity because various views are valid. Critical is that I am willing to tolerate your ideas. One may not be clear about the problem, but understand some of its dimensions.

Dealing with complexity requires a strategy and vision, not a plan! Short term versus long term balance



Erik: I am confused with “inhibitors” and “enablers” here. If one removes “inhibitors” like multiple visions, one kills the necessary complexity rather than dealing with it. Likewise, enablers like “enthusiasm for own ideas” oversimplify the necessary complexity and also do not enable dealing with it.

[Patrick B: How one deals with the tensions in Fishbones needs another Workshop! The creative contradiction within may be beneficial to sustain - indeed, may be an essential part of what makes the situation 'live' - see John Kao "Jamming" - value of "creative contradictions"].

Table discussion of Strategy

Peter Dick: leadership is required when not all the voices are recorded, when there are groups of people who don't have a voice. Leadership is about giving voice to those views [if 'the people' themselves have no way of doing that].

Govt. creating multiple organisations with overlapping responsibility in that area.

Al Campell: The problem is with plan for 15 years out in every sequential step. You need to have a preferred direction to go in and the first two steps of the plan.

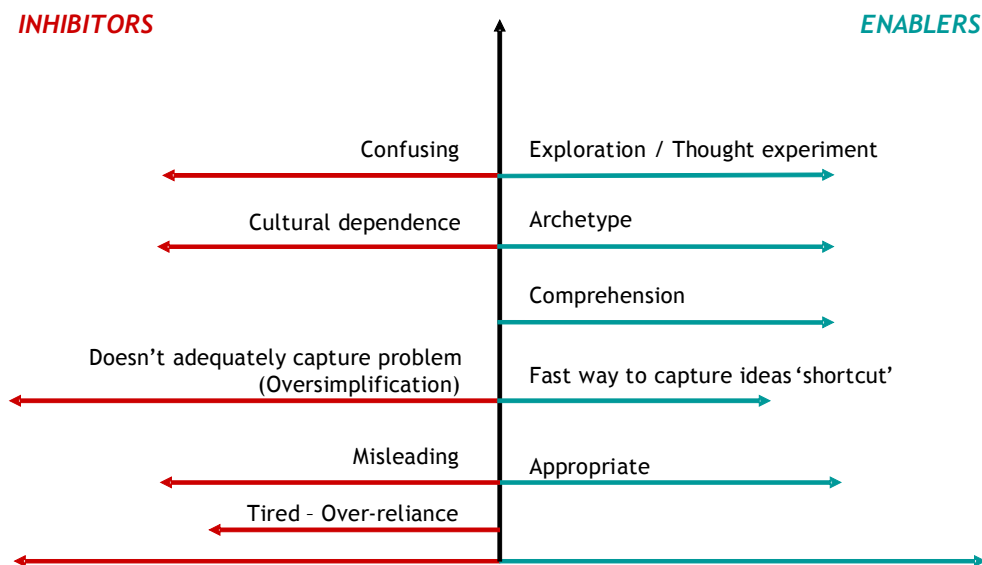
Anna: You need multiple plans [concurrent?]

COMMUNICATION, LANGUAGE AND NEGOTIATION

59. Need common ground (not standard) language (negotiation of meaning relevant to the shared context):

- How to adapt to changing narratives - trust provides a space for negotiation.
- Domains of knowledge / discourse:
 - Joining
 - Directing
 - Influencing
 - Coherence
- Formulation of metaphors and communication [See Fishbone below].

Utility of Metaphors



When we are talking about multiple complexities we avoid having to make sense. We avoid, in the same way, having to make sense of government or schools. If we had a language to talk about (eg. Government) we could deal with it quite effectively as an alternative to having multiple complexities. [But only if government was a tightly bounded unit - which it isn't - so the complexity comes from the necessary independencies and interactions with other domains].

DIVERSITY OF VIEWS AND BEHAVIOURS

60. Reconciling different views - perspective of problem (level / scale):

- Different cultures - what is the other to me?
- Reference Framework(s):
 - Values / mindsets
 - 'Expected' organisation / structure / dynamics

- Groups / individuals
- Norms / culture / power (reward and punishment)
- Methods / tools / ways-of-working
- How do we make room for emotion?
 - Emotion, creativity, control, linear versus complex.
- Ethics and Ethical Space: Does the application of complexity tools contribute to more ethical behaviour? [See Fishbone below].

Ethics: Does the application of complexity tools contribute to more ethical behaviour?

Ethical space

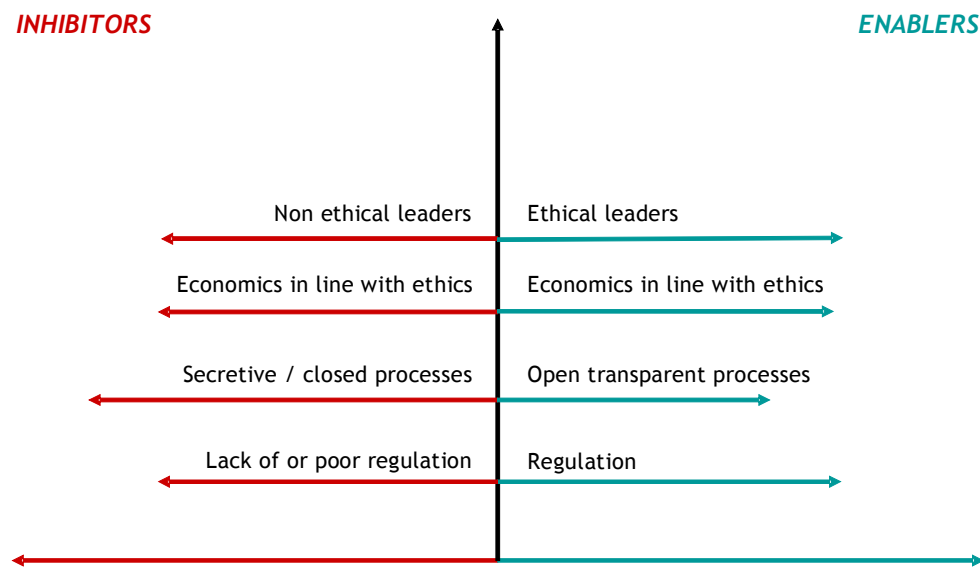


Table discussion of Ethics

Al Campbell: Lucian's presentation : Metis Intuition (Conjection). 'Fingerspitzengefühl': this is how I feel and therefore I think this is what I need to do. Pattern matching: Situation in front of you, you pattern match it with something in your past or you read about it. Look for the closest match to decide what to do. Book: Gary Klein: Recognition-Primed Decision-making is about Lucian's Phronesis.

Trevor Milburn: Point raised after Roberts presentation: Some people use intuition (Lucian's Metis) to make the right decisions or simplifications, others need to be trained (Lucian's Techne).

Anna: Liked Lucian's Metis example and including deception in that, the 'Practical nows' and operationalising them.

Who is defining the Ethics in ethical behaviour? One might abandon formal, rigid structures and do things that look quite questionable (interdisciplinary stuff), breaking down boundaries.

IS COMPLEXITY COMPUTABLE?

61. How do you communicate the usefulness and power of complexity models as distinct from the daunting notion of things being complicated?

- Controversy – are 'systems' computable or not? Which purpose?
- Whose systems? Which boundaries / level / scale / time-horizon.

QUANTIFICATION AND VALIDATION

62. Validation and Verification: what is fitness for purpose? We need to stop thinking in a deterministic way – trial and error along the way may be better - mindset changes required:

- From optimum, validate, "Prove", etc: Change language of "Success / failure" to one which recognizes complex environment - adapt and learn.
- Idea of 'targets' need to adapt – Relationship between targets must be understood (Conflicts result from Complexity / ignoring it).
- Drive to "quantify at all costs" creates distorted perceptions - it causes people to look for inappropriate indicators / give 'wrong' significance to events.

FEEDBACK, FAILURE AND LEARNING IN THE ORGANISATION

63. How can community groups learn and then act from success or failure here or elsewhere?

Table 07 (Based on Robert's talk)



- Feedback loops are essential because of Dynamic Reality – what are the Real feedback loops? [See Table 7 diagram above]

- Avoiding 'failures' in 'process' of communication (eg judgement is implicit in loaded language and specialists jargon) - but also building-in room for error in assumptions.
- How to produce nurturing self-organisation [See Fishbone below].

How to produce nurturing organisation?

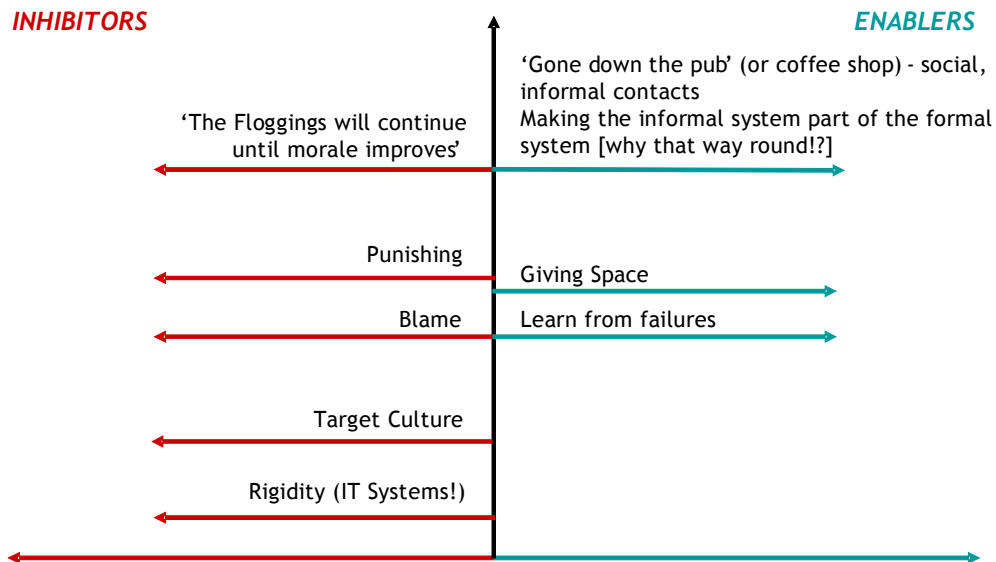


Table discussion of Nurturing

Alex Penn: It is important to provide social informal... (Pub, coffeeshop)

Merfyn: There is a difference between formal and informal structure.

Sutcliffe: Make the informal system part of your formal system. [Then, by definition, it can't be informal and so develop along with the changing realities! Needs to be some correspondence between the two - but not necessarily fixed links].

GOVERNMENT (INSTITUTIONAL) STRUCTURES ARE INHIBITING

64. Relationship between people and organisations – balance between management and empowerment [See Fishbone below]:

- Multiple direction arising from different 'Government mechanisms' induces mechanistic responses, ie. constrains, judgement, innovation. Need to develop less mechanistic view of how people operate (eg "Machinery of government"!) so dialogue and engagement can occur - partnership - mutual respect of roles / functions.
- The perverse Results of Public Policy undermine government.
- Control <-- --> Self-organising behaviour: self-organisation initiatives are inhibited by the current environment ("big players")
 - Government structures too rigid, ossified, clamped (Organisational "Glue").
 - How do you plan to generate emergence? At what level do you put in structure / does structure arise?
- Forced stakeholder engagement and power issues (Employers and public organisations) versus empowerment and influence (individuals) [See Fishbone below].

Relationship between people and organisation balance between management and empowerment

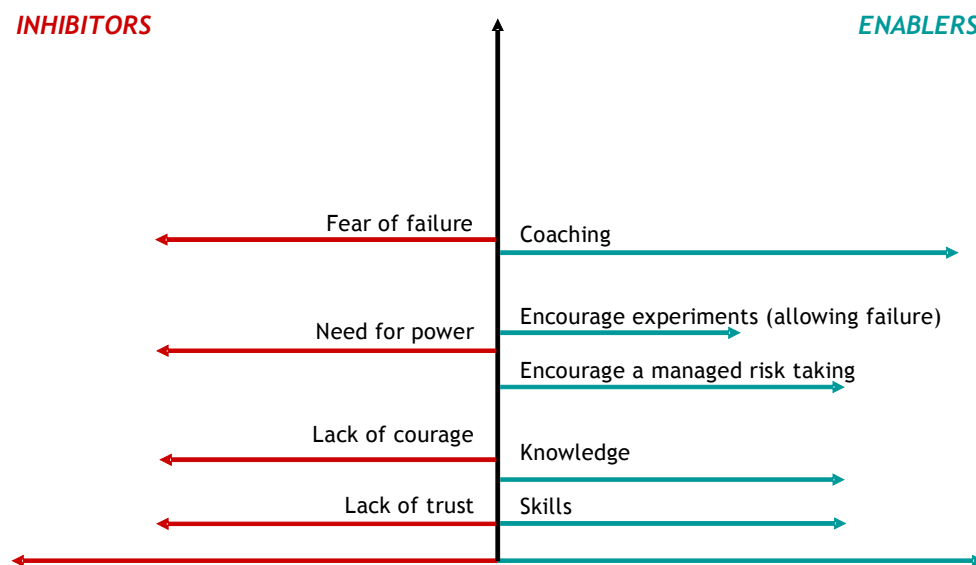


Table discussion on Empowerment

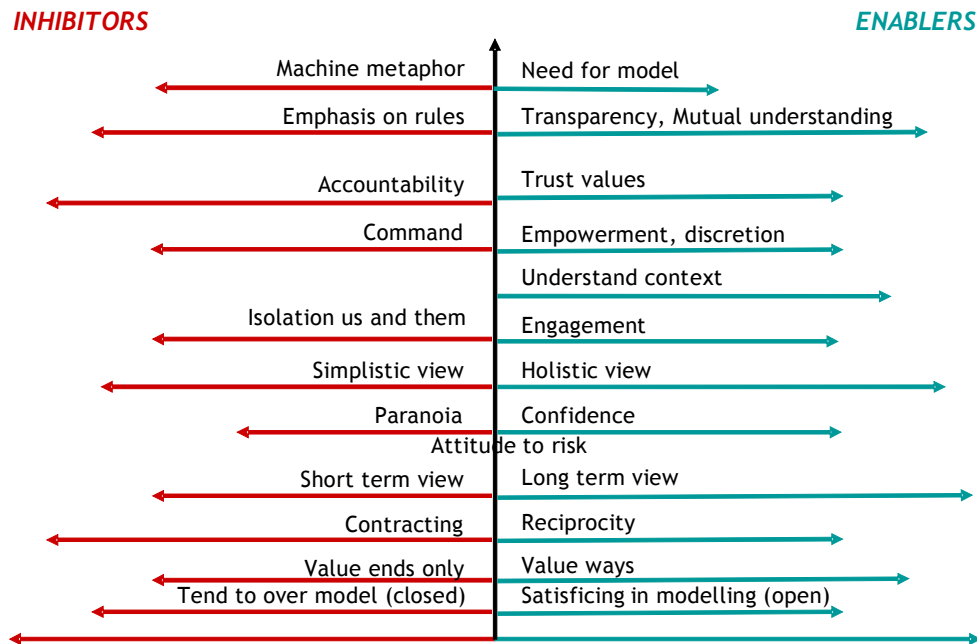
Eileen: autonomy has gone the wrong directions, it's a disaster. We all agree that we need some balance between management and empowerment. What are the enablers?

Dave Palmer: Enablers are knowledge and skills.

Eileen on Clarity: one does not have to give time to get clarity, just do it.

[Also see Thompson M "Organising and Disorganising"]

Stakeholder engagement power (Employers and public organisations) versus empowerment and influence (individuals)



PUTTING THINGS INTO PRACTICE

65. What has to be done differently?

- How to avoid “Spinning wheels” and to do something in a community environment [See Fishbone below].
- Looking for uncontested spaces
- How do you know when leadership is required? [See Fishbone below].
 - Requires understanding: Formal and informal relationships, what is espoused to what is practised.
 - The dilemma of control: leadership and being accountable.
 - Micromanagement versus nurturing self-organisation.
- The dichotomy of successful collaboration: how do you successfully nurture the tension of communality and difference [See Fishbone below].
- New technologies – new ways to self-organise. Driven by GROUNDSWELL! (Often from youth – but should be from everyone) [See Fishbone below].
- Different tools / tools used in different ways [See Fishbone below].
- Challenge: Try to get people to take a different approach and then actioning / delivering on it! Suggested solution:
 - [What change is wanted? Why? What change is already going on].
 - Collect stakeholders with various points of view. Do that early before charging ahead to define the problem.
 - Validate existing points of view - do they have to change?

- Create events that open possibilities (visits, secondments, pray . . alcohol) process goes somewhere that no one anticipated at the outset.
- Take action more experimentally without having to be right (and with commitment nevertheless).
- Aim to introduce comfort with the concept of “delivery” being a complex activity.
- Be prepared to hand over leadership as 'project' evolves:
 - To a different stakeholder
 - To a different discipline / To a different group etc.

How to avoid “Spinning wheels” and to do something in a community environment

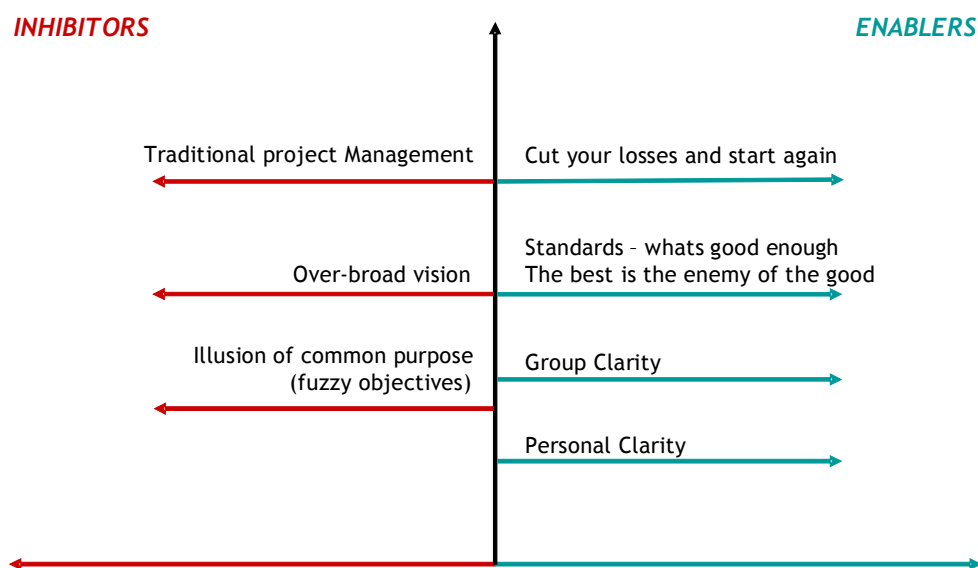


Table discussion on doing things in Practice

Eileen: How to obtain a common purpose?

In community groups the question by each individual is: what do I want to achieve. Each person has a different view on what can be done about climate change. And each view will be satisfied differently – the group is coming together voluntarily. If there is no achievement, one option is (in Anna’s case) to close the group down. Others enjoy continuing for the purpose of meeting and enjoying to talk about climate change issues.

Dave Palmer: If you have a broad vision everybody will have a personal interpretation of that vision. There has to be a focus eg in the climate change discussion: one could talk about transportation, CO2 emissions etc.

Eileen: If for dealing with the Climate Change topic in the Peckham Power Project you created job descriptions, complementary roles and paid people to achieve a particular objective they would do it. Anna wants to turn it into an organisation, which employs people which is not a community group. The question is what are the managed objectives?

Paul Argyle: Anna then would employ the appropriate structure for the context she is trying to achieve her aim in. Key issue: Clarity of context required [corresponding approach selectable].

The dichotomy of successful collaboration: how do you successfully nurture the tension and opportunity of commonality and difference?

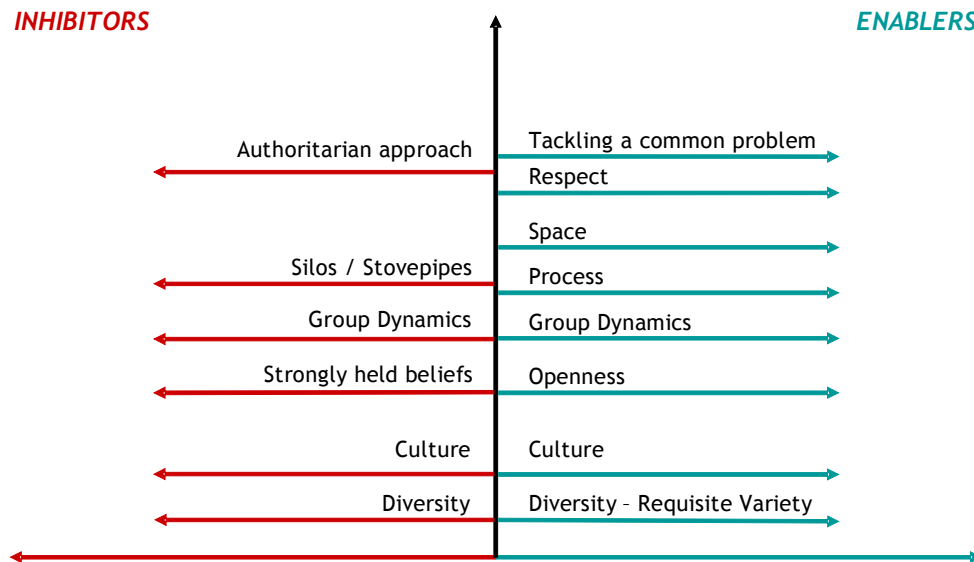


Table discussion on doing things in Practice (another table)

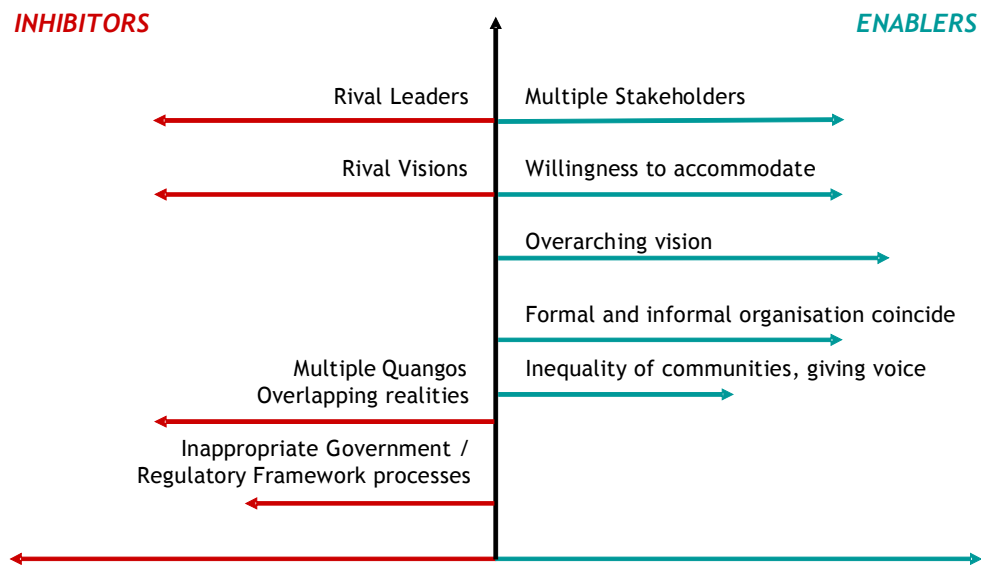
Erik: Defensive culture doesn't work, there is risk. You have to work in a trust environment, to know that my organisation allows me to explore something is important. That goes two ways: I need to feel secure, but I also need the ability to see the clients not as customers.

Dave Marsay: Understanding of context versus isolation. Recognition that the others are people in their own right and not just your customers, electorates.

Lawrence Dack: Building on trust, one is giving up control. Success of business is then on facts that you can't directly control. It is frightening but it is the only step you can take. For every piece of trust there must be verification (referring to Lucian's talk). But it is finally the balance of the right proportion [of control and trust - which is dynamically driven by context].

Dave Marsay: Object-based view of the world as compared to a relational one in the Russell sense. There is something quite deep in the way typical western people see the world, and the way the world is seen, that can create confrontations. 'Multiple use' by social scientists works for westerners - they stop you trying to make sense of a situation, because if you do [have different interpretations] you are going to get into argument. As an individual one would try to make sense [on your own terms, then try to consider other points of view].

How do you know when leadership is required? Understanding: Formal and informal relationship, what is espoused to what is practised



Issue: New technologies – new ways to self-organise. Driven by GROUNDSWELL! (Often from the Youth – but should be from everyone). Creates new possibilities.

New technologies- new ways to self-organise. GROUNDSWELL! (Youth--> everyone)

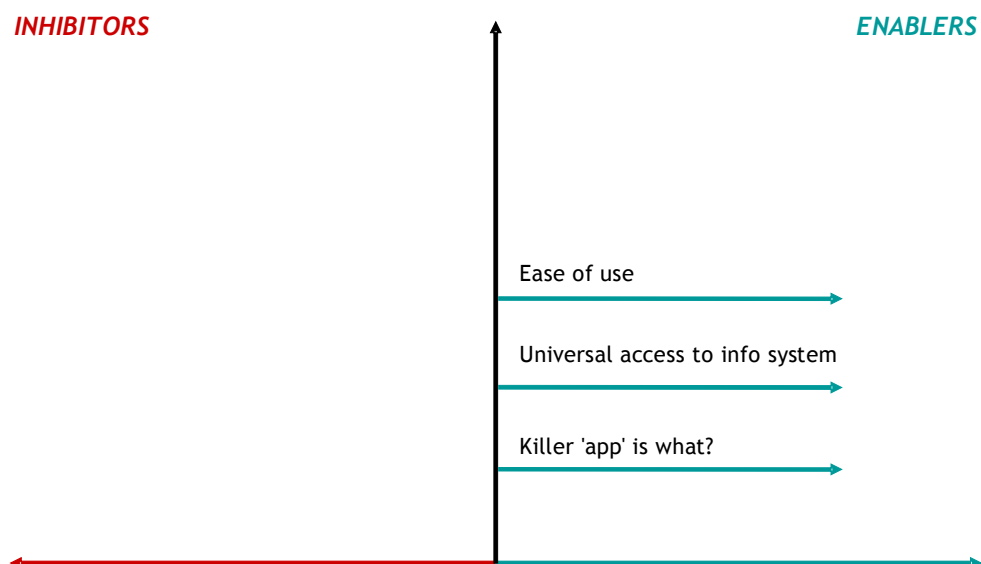


Table discussion on Tools

Alex Penn: Fish stock example – what is in the data? There was a variance in the variable; signature in the variance that allowed you to predict that the system was approaching a [attractor] basin boundary and that the system was about to collapse. This is a specific tool to say that the systems behaviour would change. Qualitatively it would really change. If you were measuring that variable you would be able to understand when the system is going to collapse. That would be a very rigorous complex systems science tool that you could use in real situations. [Yes, but is the variable knowable, detectable?]

Merfyn: Finding the right tool for the job is absolutely critical.

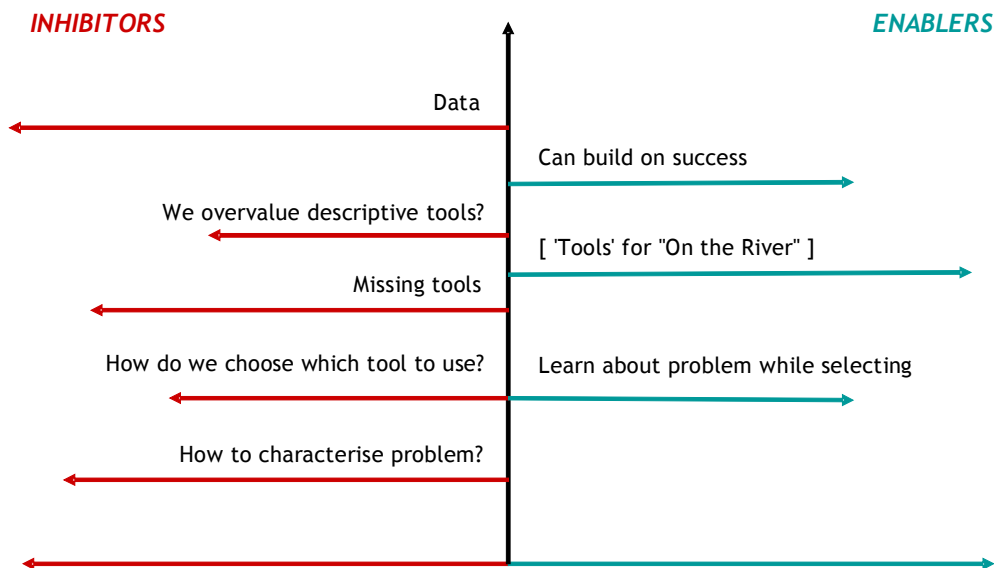
John Sutcliffe: training the proper use of tools is important. There should be a portfolio of tools which have to tie in with the lifecycle. Portfolio = use at right point [How can you judge 'right' a-priori? Or right point in a 'life-cycle]. Continuous interaction as opposed to one-off action.

Pedro P-C: We just don't use simple unique tools. Mix of tools has to be accepted, at the beginning one can use a descriptive tool, then one can use a more quantitative approach and then move on to dynamic models, but we mix them depending on observations.

Other tools are metaphors and rule of thumb when you are designing a system. One should have at least three elements supporting what is vital in the organisation - different styles of tools:

- Heuristic / Descriptive tools, Quantitative analysis, Dynamic models.

Utility of Tools



ANNEX G. RELATED PRACTITIONERS FORA

The following, non-exhaustive list is intended to cover some of the areas in which the participants of the Workshop are active. Further discussion of Workshop topics can be found in these dedicated blogs made available by various communities and organisations:

Resilience Alliance:

<http://rs.resalliance.org/>

Evolving Complexity: news and notions on the history of science, natural history, evolution and the environment:

<http://evolvingwithdarwin.blogspot.com/>

Learning for Sustainability:

<http://learningforsustainability.net/sparksforchange/>

The New York Times 'dot earth' on natural resources and the environment:

<http://dotearth.blogs.nytimes.com/>

Santa Fe Institute Science Blog 'Simplicity & Complexity':

<http://blog.santafe.edu/>

OXFAM – From Poverty to Power:

<http://www.oxfamblogs.org/fp2p/?p=39>

Poverty News:

<http://povertynewsblog.blogspot.com/>

Health and everything:

http://www.healthandeverything.org/?q=complexity_in_health_care_systems

GIS and Agent based modelling. Issued by CASA, the UCL Center for Advanced Spatial Analysis, London, UK:

<http://gisagents.blogspot.com/>

Complexity and Strategy in Public health systems:

<http://gdownie.wordpress.com/>

Adaptiveness and Innovation in Earth System Governance:

<http://adaptiveness.wordpress.com/>

Aid on the Edge of Chaos: Exploring complexity sciences in international development and humanitarian aid:

<http://aidontheedge.info/>

Plexus Institute:

<http://www.plexusinstitute.org/complexitymatters/>

ANNEX H. ABOUT THE ABACI PARTNERSHIP

Established in 2006 by a group of internationally recognized experts in the field of complexity science, The *abaci* Partnership has made itself a name for being different. We work with institutions, organisations and communities who are aware that complexity is 'normal' and offers innovation, novel opportunities and can create benefits in the dynamics of everyday environments.

abaci is renowned for its unique approach that offers comprehensive, bespoke solutions for its customers. We bring the 'extra dimension' to any solution and set novel insights, which we derive from complexity science, to work in the operational context of our customers. It is our commitment to make people the centre of the solutions we offer – as they will bring about the change.

Capabilities and capacities

abaci consists of a small team with vast experience and a track record of successfully working with partners from research institutions, commerce, government, implementing agencies and local communities in the UK, Europe and Worldwide.

Our strength is the inherent capability to 'think transdisciplinary' that our members harness when we explore your specific environment. Our novel approaches enable systematic analysis of problem-solving and decision-making in complex, dynamic and unpredictable environments. These analysis tools can be used to inform organisational change and capability development. We are multilingual and experienced in working in multicultural contexts, as well as being skilled in facilitation using a varied set of interactive and participatory tools and methods.

Our customer base

Our customers are people who deal with complex realities in their day-to-day work at all levels of decision-making. We support practitioners working internationally in:

- Conflict and crisis management
- Rural and Urban development
- Community Development
- Institutional and Business Strategy Development
- Health care
- Energy Planning
- Transport and Infrastructure Planning
- Government

abaci is represented in the Collaborative Strategies Network (UK), the Causality in Complex Systems discussion group (Australia), the Royal United Services Institute (UK) and the Complex Systems Society (UK).

For more information, see our website: www.abaci.net

APPENDIX 1 - REPORT DOCUMENTATION PAGE



Originator's Report Number		ECCS-01-2009_PCTW	
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Customer / Sponsor's Post / Name and Location		N/A	
Report Protective Marking and any other markings	Date of issue	Pagination	No. of references
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Report Title			
TENDER FOR THE CONTRACT 'Role and impact of professional and Scientific Societies in ICT research, education and innovation'.			
Authors		Patrick Beutement and Christine Bröner, The <i>abaci</i> Partnership LLP, UK	
Secondary Release Limitations		Not to be released further without the consent of the Tendering Parties of The <i>abaci</i> Partnership LLP.	
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<p>The <i>abaci</i> Partnership LLP organised and facilitated a Workshop called "Putting complexity to work – supporting the Practitioners" on 24 September 2009 as part of the European Conference on Complex Systems (ECCS 2009) held at the University of Warwick, UK.</p> <p>This White Paper collates, analyses and summarises the findings from the Workshop.</p>			
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