

Working Ideas, Insights for Systems Modelling: The Broader Community of Systems Thinkers

A Record of the Plenary Session held on the morning of Tuesday 27th July 2004
at the International Conference of the System Dynamics Society
Keble College, Oxford

Introduction

In 2001/02, a series of research meetings funded by the UK Engineering and Physical Sciences Research Council EPSRC, and organised by Lancaster University, explored in depth the relationship between hard and soft approaches to OR and systems modelling. The Oxford 2004 plenary session on 'Working Ideas' replayed selected insights from these research meetings of particular relevance to the system dynamics community. Talks by Michael Pidd, John Morecroft and Peter Checkland were followed by lively audience participation facilitated by Kim Warren.

If you cast your mind back to the tranquil surroundings of Keble College, it is useful to recall that the UK holds a very special place in the history of operational research, soft OR, soft systems and qualitative system dynamics. The discipline of OR emerged in the 1940s from the wartime work of a group of British scientists including physicist P.M.S. Blackett. The 1980s saw the development of soft OR approaches for problem structuring. Peter Checkland's Soft Systems Methodology SSM and Colin Eden's Strategic Options Development SODA are well-known examples. Moreover, it was around the same time that Eric Wolstenholme and Geoff Coyle first proposed Qualitative System Dynamics QSD, and advocated the value of causal loops diagrams for problem structuring. So it is especially appropriate that the Oxford 2004 conference, in the heart of England, was the venue to consider system dynamics in context of the UK's long tradition and practice of soft OR, particularly soft systems modelling.

The materials in this document provide a complete record of the plenary session. There are three main parts. First there are biographical notes of the speakers. Then there are the speakers' slide presentations. Finally there is a synopsis of the dialogue between the audience and speakers.

There were three presentations. Mike Pidd began by outlining the purpose of the interdisciplinary network on complementarity in systems modelling INCISM, and then described the use of models as tools for thinking and some distinctions between hard and soft modelling. Next John Morecroft reflected on the INCISM meetings from the viewpoint of a system dynamicist, and compared soft modelling with system dynamics as alternative processes for 'working ideas' about strategy. Finally Peter Checkland elucidated the hard/soft distinction, described the learning process associated with soft systems modelling and identified some challenges in using system dynamics to furnish an enquiry process. The slides and speakers' notes from all three talks appear later in this document. Further information about the talks can be found in chapters 1,3 and 7 of *Systems Modelling: Theory and Practice*, a book of papers from the complete INCISM meetings, edited by Mike Pidd and published by Wiley in 2004.

<http://www.wileyeurope.com/WileyCDA/WileyTitle/productCd-0470867310.html>

Biographical Notes

Peter Checkland is Emeritus Professor of Systems at Lancaster University in the Department of Systems and Information Management. After getting an Oxford 'First' in Chemistry he joined ICI Ltd. and worked for 15 years in the man-made fibre industry. When he left ICI he was Manager for a Research Group of 100 responsible for the development of new products and processes based on fibre-making technology. Since joining Lancaster in 1969 he has led research into tackling real-world problems using soft systems thinking which has produced Soft Systems Methodology (SSM). SSM is taught in universities and colleges round the world and has been taken up by many industrial and other organisations. The nature of SSM and its development is described in his books 'Systems Thinking, Systems Practice' (1990, Wiley) and with Jim Scholes, a research collaborator, 'Soft Systems Methodology in Action' (1990, Wiley). In 1994 he was the first recipient of 'the most distinguished and outstanding contributor award' of the Information Systems Methodologies Group of the British Computer Society. In 1991 he was awarded an Honorary DSc by City University and in 1995 an Honorary Doctorate by the Open University. He also holds Honorary Doctorates from Erasmus University (The Netherlands) and from the Prague University of Economics, and was the first recipient of the gold medal of the UK Systems Society. Research continues with recent major involvement in both industry and in the public sector in both general problem solving and in information systems work.

John Morecroft is Adjunct Associate Professor of Decision Science at London Business School and former Associate Dean of the School's Executive MBA programme. In 1990, he received the Jay Wright Forrester Award of the System Dynamics Society and in 1996 he was the Society's President. Currently he is Chair of the Society's Academic Awards Committee. He has published many journal articles about system dynamics and strategic modelling and three edited volumes: 'Modelling for Learning Organisations' (1994, with John Sterman), 'System Dynamics for Policy, Strategy and Management Education' (1999, with Geoffrey Coyle), and 'Systems Perspectives on Resources, Capabilities and Management Processes' (2002, with Ron Sanchez and Aime Heene). He has led a number of applied research projects for international organizations including Royal Dutch/Shell, BBC World Service, Harley Davidson, McKinsey & Co and Mars. Before joining London Business School in 1986 he was on the faculty of MIT's Sloan School of Management where he also received his PhD.

Michael Pidd is Professor of Management Science at Lancaster University and is currently a Public Services Research Fellow in the Advanced Institute for Management Research. He was President of the Operational Research Society in 2000/1 and currently chairs its Accreditation Panel. He is author of many papers and books on themes related to modelling and simulation. His text, 'Computer Simulation in Management Science' will shortly appear in its 5th edition and 'Tools for Thinking: Modelling in Management Science' is in its second edition. During 2001/2 he coordinated the EPSRC INCISM network which allowed a group of academics and practitioners to consider how soft and hard OR/MS methods might be best combined. The book 'Systems Modelling: Theory and Practice', which he edited, is one output

from these deliberations and some of that material is the focus for the plenary session ‘Working Ideas, Insights for Systems Modelling’ at this Oxford conference. He is a firm believer that the most interesting things happen at the interface between theory and practice.

Kim Warren is Adjunct Associate Professor of Strategic Management at London Business School, prior to which his professional experience covered strategy development in various industries, including petrochemicals, oil, brewing and consumer-service retailing. His work on Strategy Dynamics captures the interdependencies between the resources and capabilities of any enterprise, leading to fact-based architectures that explain and anticipate performance through time. This is described in the text-book ‘[Competitive Strategy Dynamics](#)’ Wiley: July 2002. Collaborations with major corporates in Europe, the US and Far East, plus various public service and not-for-profit organisations, focus on the use of Strategy Dynamics to achieve substantial improvements in performance through time. Kim also works with others to develop simulation-based learning materials, both for management education and corporate strategy challenges. These cover a wide range of sectors, including brand management, professional services, retailing and airlines. These popular exercises enable learners to go beyond mere debate about case situations, and experience directly the design and delivery, through time, of strategic performance, and are designed to communicate a rigorous, fact-based approach to strategy. The Strategy Dynamics method underlying these materials forms a popular course amongst degree students at LBS, and the course is being adopted by other international Business Schools.

Speakers' Slides with Notes

The slides and notes are presented in the same order as the conference talks, starting with Mike Pidd, then John Morecroft and finally Peter Checkland.



INCISM: complementarity in systems modelling

Mike Pidd

Lancaster University

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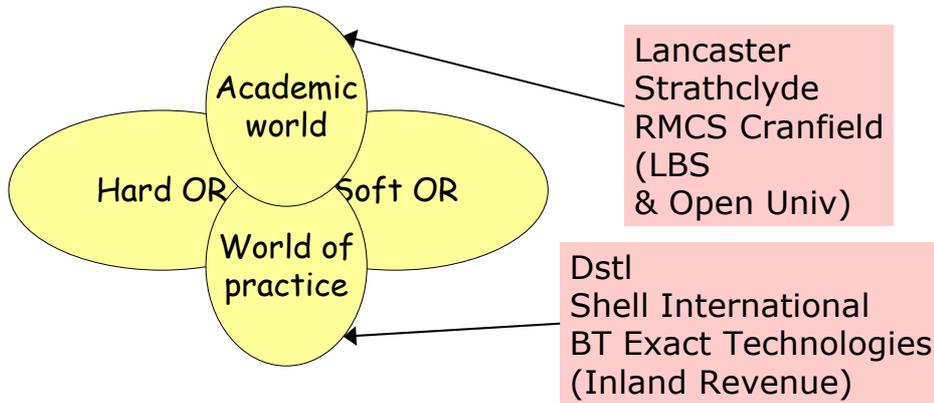
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The INCISM network

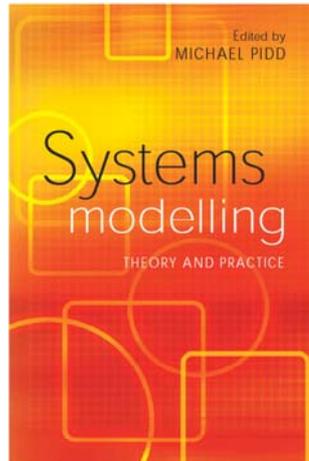
EPSRC An Interdisciplinary Network on
Complementarity In Systems Modelling



During 2000 and 2001 the UK's Engineering and Physical Sciences Research Council (EPSRC) funded the a network that brought together practitioners and academics from the field of operational research. The Interdisciplinary Network on Complementarity In Systems Modelling (INCISM) met about every 3 months to discuss how soft and hard methods and approaches might be used in a complementary way. The initial group of practitioners came from Dstl (the UK's Defence Science and Technology Labs), Shell International and BT Exact Technologies. Later participants included the Inland Revenue. The initial academic groups were from Lancaster and Strathclyde Universities, plus the Royal Military College of Science (Cranfield University). Later participants included London Business School and the Open University.

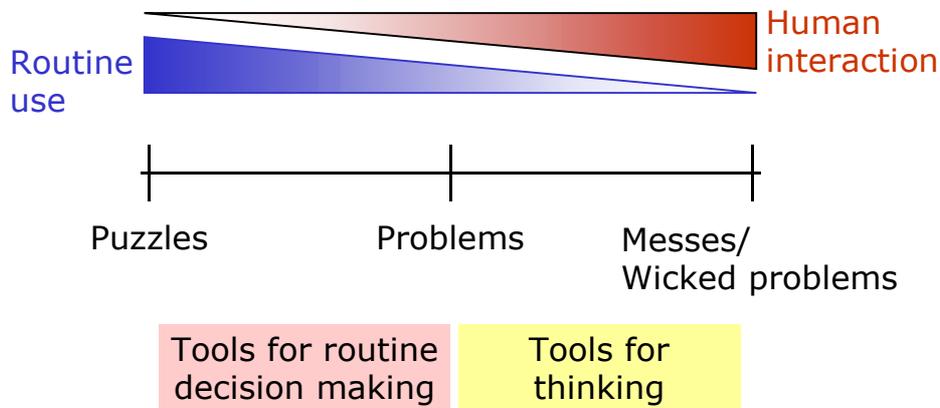
The mixture of academic and practitioners was deliberate and is based on my belief that the interesting things happen on the boundary between theory and practice. It was particularly interesting to see how academics and practitioners took often quite different approaches to the same topics. This is not to suggest that only academics think about things and only practitioners use modelling approaches – such a view is clearly nonsense. The INCISM network brought together and range of opinion, insights and experience.

The INCISM book



The output from the INCISM network includes: M. Pidd (ed) (2004) Systems modelling: theory and practice. This is available from booksellers or from Wiley at <http://www.wileyeurope.com/WileyCDA/WileyTitle/productCd-0470867310.html>

Models as tools for thinking



This slide aims to bring a little clarity into the discussion about models, particularly as they are used in OR/MS. Some models are used every day for routine decision making – for example, for routing delivery vehicles, for rostering air crews and for the dynamic pricing of hotel rooms and airline seats. Before they can be developed and used, much effort has gone into structuring the problems into solvable puzzles. It should be noted though, that this is not trivial and requires great ingenuity and skill in many cases.

At the other extreme are models used as tools for thinking. Such models may only be used once or may even not be ‘used’ at all – the insights gained in their construction may make their ‘use’ unnecessary. The model serves as a device that supports the thinking of individuals and groups and may represent beliefs and views as well as ‘objective knowledge’.

This distinction between tools for routine decision making and tools for thinking is not based on a distinction between qualitative and quantitative models.

Systems modelling: hard and soft



Methodology: pragmatic
Data: 'out there', bias
 undesirable
Aim: quantification, decision
Model: would-be
 representation of 'real world'
Validity: crucial



Methodology: rigorous
Data: ambiguous, based
 on judgment
Aim: agreement & learning
Model: device to support
 debate
Validity: problematic

One major focus of the INCISM meetings was continued discussion of the difference between hard and soft approaches in systems modelling. It is fair to say that there was no unanimity amongst INCISM participants and this slide tries to capture some of the differences between the two archetypes. It is based on one produced by George Paterson during an INCISM meeting.

The graphics are an attempt to show that the aim of hard approaches to systems modelling is to abstract and thus to represent the regularities in the system being modelled. Thus, this is depicted as shifting from a 'real' world to one in which irregularities (primarily human) have been removed. By contrast, soft approaches are shown as focusing on the irregularities and one-off situations that result from human involvement and the questions of meanings and motives that follow.

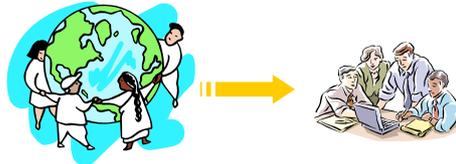
System models: 2 views

Would-be representations of the real world



- used to investigate options
- supports rational choice
- supports exploration
- validation important

Devices to support debate



- used as ideal types
- procedural rationality
- supports exploration
- validation problematic

The final slide continues the theme of the previous one and tries to capture two distinct views of systems modelling, based on the distinction made by Herbert Simon between substantive rationality (shown here as rational choice) and procedural rationality. In essence, models as tools for routine decision making are based on assumptions very close to substantive rationality and are, therefore, intended as representations of some 'real' world. By contrast, tools for thinking aim to support procedural rationality with its emphasis on the use of reason in careful deliberation and the search for options that this involves.

These are my deliberations, kept rather short since I was asked to speak for about 15 minutes. I'm sure that John Morecroft and Peter Checkland will see things a little differently and that we can later have a fascinating debate on these issues.



**REFLECTIONS FROM THE INCISM
MEETINGS FOR SYSTEM
DYNAMICS**

**John Morecroft
London Business School**

**International System Dynamics Conference
Oxford 2004**

Four Observations from INCISM

You and I may have in mind dramatically different yet valid models of a single organisation - these are implicit soft models

There are rigorous methods to capture implicit soft models formally and explicitly - that's soft modelling

A causal loop diagram is not necessarily a soft model

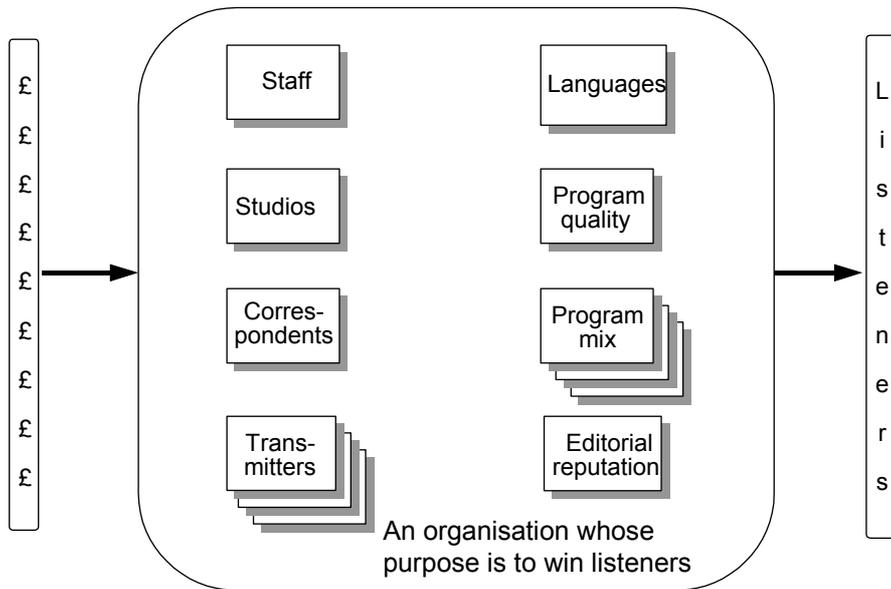
A simulator is a tool to stimulate imagination, dialogue and learning - so are soft models

Different soft models show up in statements such as “the world could be like this no, no the world could be like this”. Add the force of intention, unique to human systems, and you can begin to see the possibility for different yet valid models, the seeds of conflict, and the relevance of soft models to organisational problems. “The world should be like this no, no the world should be like this”. Soft modellers say it is helpful to make these implicit models explicit – and that can be a rigorous process.

If you use a causal loop diagram to say “the world is like this” then you are not using it as a soft model. Qualitative models and soft models are different – that was a useful lesson for me.

When a system dynamics model is built, tested and calibrated we are usually saying “the world is a bit like this”. Surely that's hard modelling. Yet we use the modelling process and finished simulators as though we were soft modellers, to stimulate imagination, dialogue and learning. So what's going on here? This is a question that puzzled me throughout the INCISM meetings. Let me give you a practical example, somewhat contrived, that helped me make sense of the puzzle.

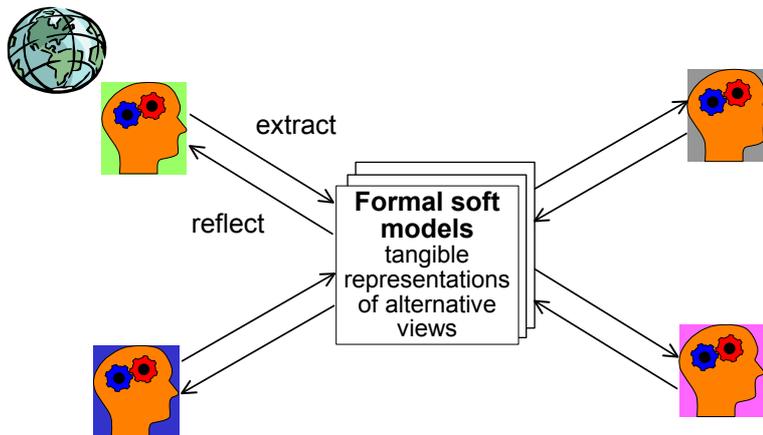
Alternative Models of a Radio Broadcaster



Imagine you are an executive from a successful commercial radio station in the US and have been assigned to London to set-up a rival to Classic FM, a very successful radio station that broadcasts classical music (with lots of adverts and a sprinkling of news and weather) to a region 200 miles or more around the capital. You want to find out more about broadcasting in the UK and have been invited to sit-in on a budget and strategy meeting of another successful radio station in London (not Classic FM). You don't know anything about this broadcaster (other than it too is successful), so you listen. You soon realise that the organisation is keen to win listeners while remaining cost competitive with rivals. That's no surprise. The available budget depends on listeners (though you don't know exactly how in this

case). But how is this budget deployed? Members of the management team make clear that for them it's vitally important to have good staff and well-equipped studios. Also, to win and retain listeners requires the right mix of programmes as well as transmitters to reach the audience. So far so good. But then you hear some views that surprise you. The team insists that a large fraction of the capital budget is spent on high-cost short-wave transmitters – the kind that can broadcast from a remote location in the UK to almost any part of the globe. Spare capital budget buys new FM transmitters to improve listening quality in selected cities. This transmission strategy is certainly not what you had in mind for your rival to Classic FM, but you continue to listen. The next two items in the discussion really surprise you. There's a heated debate about the importance of broadcasting in at least 40 different languages and maintaining a cadre of specialist correspondents in political hotspots such as the Balkans and Baghdad. You know that's really expensive and are puzzled about how this organisation can be so successful. The final items make sense – the team agrees that high quality programming and an excellent impartial editorial reputation is vital to continued success. As you reflect on the conversation you note that if you were running this organisation you would cut the language portfolio, redeploy the correspondents, change the programme mix, scrap the expensive short wave transmitters and invest in a network of good local FM transmitters. The point here is that the model of the organisation you have in mind depends on its purpose. In your mind is a model for a rival to Classic FM whose purpose is to bring popular classical music to a large domestic audience using high-quality local FM transmission. You subsequently discover the organisation you visited was BBC World Service whose purpose is to be the world's best known and most respected voice in global radio broadcasting, and first choice among the international politically minded elite for authoritative and impartial news. World Service is funded by an annual grant from the British government and operates more than 50 transmitters covering 65% of the earth and 80% of the world population, broadcasting over 1200 programmes per week in English and 43 other languages, reaching 138 million people every week.

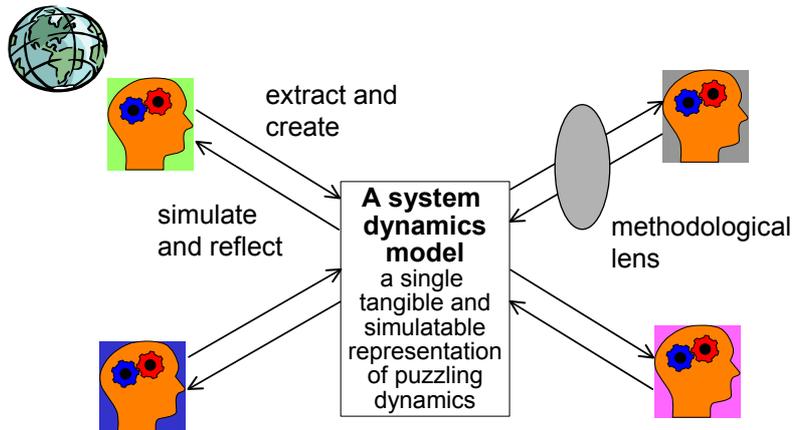
Working Ideas with Soft Models



Formal soft models, as tangible intellectual constructs, to explore alternative views (mental models) of an organisation, its purpose & actions

We all interpret the world through mental models and mindsets. These implicit soft models can be extracted and formalised. Views differ because they are coloured by our experience, education, beliefs, intentions and ambitions. A manager bringing a Classic FM mindset (shocking pink) to World Service will encounter sharply different views (subdued grey, blue and green) about how best to run a broadcaster. Soft modellers deliberately set out to capture these alternative yet valid views in pictures and diagrams (tangible representations) that enable constructive comparison and mutual accommodation.

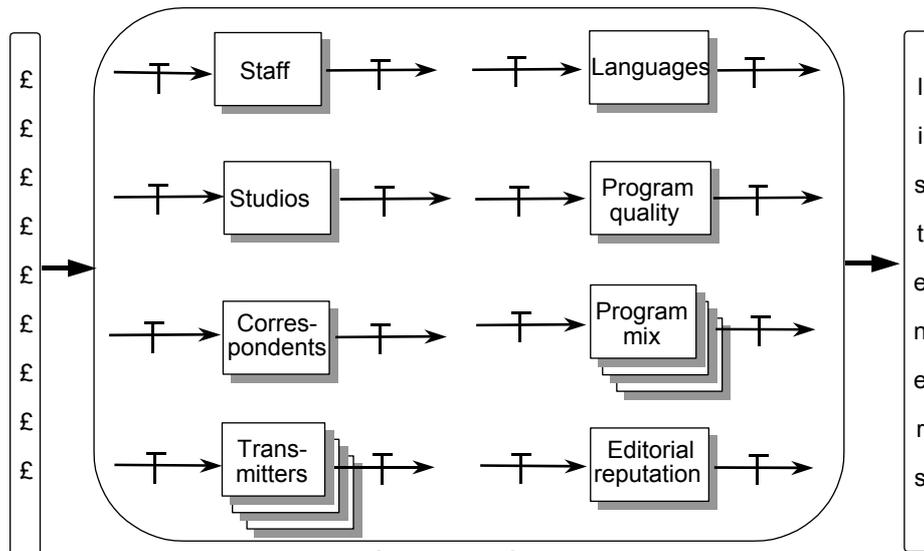
Working Ideas with System Dynamics



A system dynamics model, as a tangible intellectual construct, to explore performance over time (dynamics) stemming from a puzzling strategic issue facing the organisation

However, a similar picture, showing alternative mental models, fits perfectly with system dynamics modelling, except in this case there is a single model as the focus for working ideas. What does this anomaly tell us about the nature of system dynamics? Are we interpretive or functionalist? Should we care? I think we should. It is clear from the diagram that we model the world or any organisation as it is interpreted through the minds of experienced people. We nevertheless strive for a single representation because our purpose is usually to investigate a specific dynamical strategy issue agreed with the organisation. In a SD study the first question is “what dynamical issue is the model intended to investigate”? So in issue selection we *are* soft modellers, implicitly accepting that different models would be needed to address different dynamical issues in one and the same organisation. However, once we have settled on an issue then we become much harder modellers, using our distinctive methodological lens to view the enterprise as an information feedback system. In other words we do not literally replicate, or accept at face value, the team’s mental models (although we often say we do). In that sense we are not strictly interpretive. Let’s briefly illustrate these methodological points with the BBC World Service model.

BBC World Service as a Dynamical System



A representation of a publicly funded international news broadcaster to explore ten-year funding scenarios

This diagram is similar to the earlier one except now all the ‘areas’ of the broadcaster are shown as stock accumulations. World Service is conceived as a dynamical system in which public funds from Government on the left are deployed in various ways to build staff, studios, transmitters and programming that collectively attract listeners on the right. The model was used to explore 10-year funding scenarios and to support the funding bid. A successful broadcaster builds and maintains a ‘balanced’ portfolio of tangible and intangible assets that attract the right kind of listeners at reasonable cost. Behind the scenes there’s a complex coordinating web of feedback loops. Because of dynamic complexity in the web it is not obvious whether or not an effective balance of assets will result. The model contains objective hard causal links: if you have more transmitters then you can reach a bigger audience. There are also numerous soft causal links representing information flows and behavioural decisionmaking (including goal formation and goal adjustment) such as preferential investment in short wave transmitters. The model contributes to strategy in two distinct ways. First, the simulator is a reliable and impartial inference engine that helps people to imagine and prepare for the consequences of funding changes. Second, the diagram itself expands the boundary of people’s thinking beyond narrow functional silos.

Conclusions

Useful strategic models combine objective causality, intentions and beliefs

In SD we are soft modellers when we 'expand the boundary' and when we model behavioural decision-making, goal formation and goal adjustment

System dynamics simulators expose inconsistencies in our thinking about performance over time – that's important

All of us are 'working ideas'

Useful strategic models combine objective causality, intentions and beliefs. They are soft models. Some soft models include overarching intentions "the world *should* be like this or like that". In SD we don't overtly model profound differences in strategic intent, though we often discover situations in which stated strategic intent is inconsistent with local, functional intent. That's been an important learning point for me.

However, we are soft modellers when for example we use causal loop diagrams to say "there's more to your world than you think". The health care models presented by Eric Wolstenholme in this conference and the transport policy model in John Sterman's *Business Dynamics* book are good examples of causal loop diagrams used rigorously to expand the boundary of people's thinking. We are also doing soft modelling whenever we represent purposive behavioural decision making, including goal adjustment and goal formation – core information feedback processes, containing institutionalised intentions and beliefs. We should appreciate there can be value and rigour in our own soft modelling as well as other types of soft modelling, particularly those where overarching differences of strategic intent are paramount.

System dynamics simulators (as opposed to causal loops or diagrams alone) rigorously examine puzzling performance over time (performance that *no-one* intends, understands or foresees –) – "if the parts of your world are like this and they are put together like that then here are the surprising dynamics that will result". Exposing inconsistencies in dynamic thinking is analogous to exposing conflicting intentions – and just as important for effective strategy, to improve collective foresight and to avoid nasty surprises.

All of us, in system dynamics and soft systems, are working ideas so that organisations can better achieve their strategic goals.

Summary of Peter Checkland's Presentation

Slide One sets out the aim of the presentation

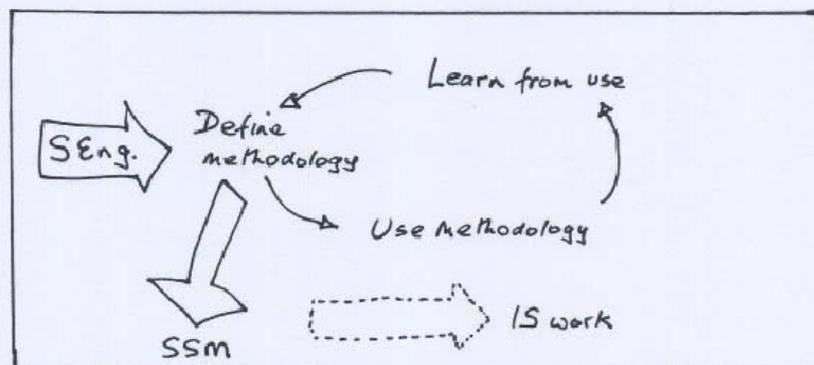
Slide
One

Aim : • elucidate the Hard / Soft distinction
• sharply define it

Source : • emergence of the distinction in the
30 year Action Research programme
which developed Soft Systems Methodology

Slide Two : The Lancaster research programme started by trying to apply 1950's 'Systems Engineering' to management problem situations. It was inadequate in the face of the full complexity of human situations. As the programme experiences accumulated (more than 300 in the 30 years of the programme) S.Eng. was completely redefined as Soft-Systems Methodology. A huge step had been taken.

Slide
Two
(an overlay)



Slide Three indicates the crucial learning in transforming S.Eng. into SSM: ^{first,} accept that all human problem situations have one thing in common: people trying to act purposefully. So a way of modelling purposeful activity systems was developed. But, purposeful activity is always richly interpreted in human discourse. So models could only be made as concepts derived from a declared worldview. They were not would-be descriptions of real-world action. (Thus 'a prison' can have a set of relevant models: it can be modelled as 'a punishment system', 'a rehabilitation system', 'a system to protect society', 'a system to train criminals'..... etc. Any actual prison is a changing mix of all these perceptions, and others!)

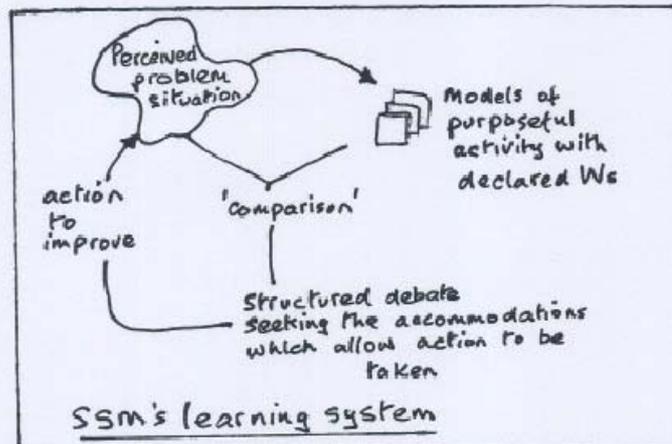
Slide
Three

Four crucial learning moments

- o model purposeful activity
- o declare the worldview (Weltanschauung)
- o use models as devices to structure debate about change
- (o models → ISwork)

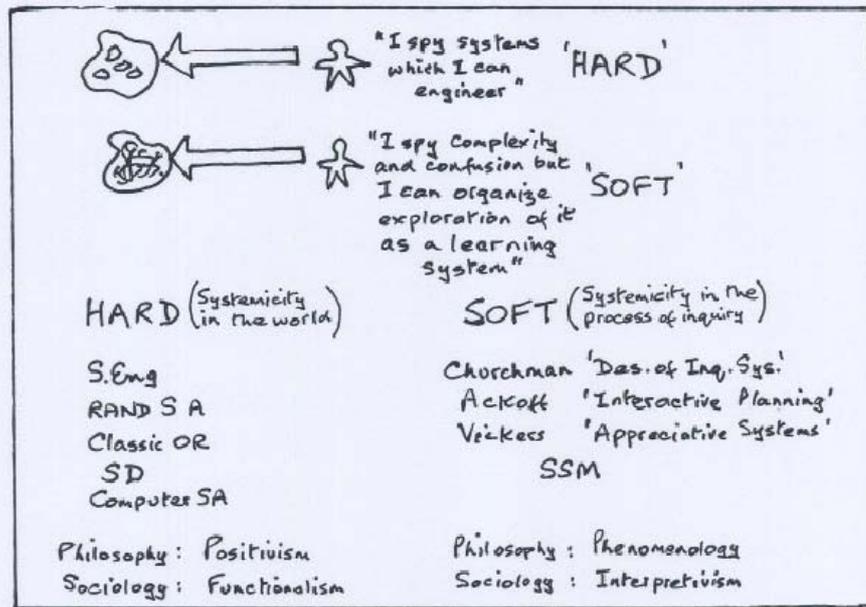
Slide four: Hence, thirdly, the models were simply devices to enable a debate about change to be structured. That debate seeks the accommodations among conflicting worldviews which enable 'action to improve' to be taken. (An accommodation entails finding a version of the real situation which different people with different worldviews can nevertheless live with.) The change will usually be a mix of structural, procedural and attitudinal change. It may - very rarely in our experience - entail 'implementing a system'.

Slide
Four



Slide Five: The huge step from the 'Hard' outlook to the 'Soft' outlook is illustrated in Slide 5. Because of the casual way we use the word 'system' in everyday language ('the legal system', 'healthcare systems' etc) as if it were a simple ~~label~~ label word, many people find the Hard/Soft distinction difficult to understand.

Slide Five



Slide Six suggests issues which SD needs to face — from the perspective of SSH development.

SD models are always taken to be possible real-world instrumentalities. Taking this as a special case would enable SD to extend its relevance to the found becoming, bugging confusion of ^{actual} human situations

Slide
Six

System Dynamics ?

Origins : HARD

Current interest in 'qualitative SD'

Need :
(my W!)

- greater process orientation
- acknowledge Weltanschauungen
- use models to furnish an inquiring process
- Shift of philosophy/sociology

Synopsis of the Dialogue Between the Audience and Speakers

The synopsis is based on notes taken in the O'Reilly Lecture Theatre by Martin Kunc, doctoral student in Decision Science at London Business School. It is intended not as a verbatim record but rather as a reminder of the useful and wide-ranging discussion that followed the presentations. If any of the contributors to the dialogue (either audience or speakers) wish to clarify and elaborate their comments then please e-mail John Morecroft at London Business School. (jmorecroft@london.edu)

Note on Process: Kim Warren invited comments and questions from the audience, specifically requesting contributions not only from academics but also from practitioners, students and newcomers to the field of system dynamics.

Speaker Abbreviations: Mike Pidd (MP), John Morecroft (JM), Peter Checkland (PC)

1. Anonymous: If SD did all the things suggested by the panel, what would make SD different from SSM?

PC: SD will remain as a way of having richer models than activity modelling.

2. Anonymous: Assuming there are different views, we have to make different models of these different views. In that case, would it be a useful step for SD?

PC: Yes, it would be. SD uses the same world view but needs to identify motivations and feelings as well as emotions of the participants.

3. David Andersen: A place between hard and soft is group model building. How is this located in Soft System Modelling?

PC: Yes, it is a step between the two views hard-soft since it can be a problem solving tool.

MP: Newtonian physics still works. The technical side is important but you lose the excitement of soft views.

PC: Newtonian physics has lasted longer than we expected but Concorde was not only an airplane but a political project also.

4. John Sterman: I completely agree with the thrust of the talks and the useful distinction drawn between soft models and qualitative models. Moreover, the speakers are in 'violent agreement with good SD practice' because from the beginning SD models were characterised as tools for thinking. However, I disagree with the hard characterisation of SD. In 1971 Forrester sent a memo to the MIT group entitled "The model vs. the modelling process" that distinguishes the model as an artefact from the interactive learning process that creates it.

MP: This stuff is not just common sense (of the kind consultants might apply) because we also need to use a rigorous methodological approach.

PC: There are still many hard statements about systems interventions in the SD community, in fact I noted many such statements in the sessions I have already attended at this conference and in the materials I picked-up.

5. Anonymous newcomer: How do we keep any model relevant to a change agenda?

JM: During a modelling project we usually sample the views of several experienced members of the organisation in order to move beyond narrow functional silos and personal agendas. So the SD modelling process uses individual's views not to bring

about change directly but to build a picture of the larger system to explain “Why are these puzzling dynamics happening?”

MP: It depends on what the model is used for. If the model is a repository of knowledge it becomes part of routine decision-making, not a one-shot change management exercise.

6. Anonymous with cybernetics background: SD is a good description but not more than that. We are trying to make a map, but we cannot apply too much variety. We just need to understand the description and the boundaries of the model.

PC: A model is a precise description. As it clarifies the time scale, level and views of the different participants, the model shows precision.

7. Anonymous: What is the outcome of hard and soft approaches?

PC: We have to challenge the idea of implementation as the outcome of modelling projects. Change is a mix of structural, process and attitudinal changes not a system implementation.

MP: Colin Eden suggested that $\text{Outcome} = \text{process} * \text{content}$.

The world is messy; there are not independent variables to change individually.

JM: The tangible outcome of a system dynamics project is often a simulation model. A simulator then leads to important intangible outcomes by challenging people’s mental models of dynamics and by offering an impartial view of likely performance over time to help change.

8. Eric Wolstenholme: In an early stage of my academic career, before working in SD, I used to teach SSM. However, we have to communicate to managers in the right way and terms. So it is good to talk in their way using any approach. But we have to be aware of the spectrum of approaches because we cannot do anything about ‘feedback’ – feedback is inherent to any situation.

PC: Yes, language used in an intervention is important vs. using outside language. And, there are feedback structures in activity models (Soft System Modelling).

9. Anonymous new practitioner: We never see two models of the same situation in SD!

PC: Most people don’t know the problem, so we try to tease out the problem.

MP: All knowledge is painful and all models for me are good to help.

JM: In SD we do not build alternative models because we assume that puzzling dynamics arise from partial views of a situation and ‘misperceptions of feedback’ rather than fundamentally conflicting views of purpose. Often we start with a small model (representing a partial view) and expand the boundary to show hidden interdependencies.