Systems thinking and action research with PrOH Modelling

- Soft systems methodology is used in action research to define complex problems.
- Professor Ben Clegg and Dr Krishna Balthu from Aston Business School in the UK use soft systems methodology principles in their Process Oriented Holonic (PrOH) Modelling Methodology to resolve socio-technical problems and create organisational change.
- PrOH Modelling enables users to draw out systemic success factors that focus on changing human behaviour.
- They show how PrOH Modelling and action research can be used to create innovations to make processes more effective, efficient, and accessible.

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While taking it apart to see how it works can help us understand a physical system, solving problems in social systems often requires a more holistic approach. Systems thinking takes a more rounded view and considers how individual parts interact and influence each other within the whole system.

Action research is a method that involves identifying the problem, intervening, and learning from the intervention. Systems thinking is often used in action research to define complex problems so that practical actions can be taken to improve systems and resolve problems.

Soft systems methodologies

Soft systems methodologies and soft system thinking are particularly useful problem-solving approaches for resolving complex interrelated problems and creating organisational change. They concentrate on making sense of whole systems with the focus on changing human behaviour.

Professor Ben Clegg from Aston Business School in Birmingham, UK, developed Process Oriented Holonic Modelling, commonly known as 'PrOH Modelling'. He explains how PrOH Modelling uses soft systems methodology principles to understand and change organisations' socio-technical problems.

PrOH Modelling is especially suitable for holistic, complex, systemic problems that are prone to dynamic change and impact on performance. It has already been applied to numerous cases in the automotive, aerospace, legal, and capital goods sectors.

In some recent work, Clegg and Balthu apply PrOH Modelling to investigate improvement opportunities in a law firm. This increasingly popular soft systems methodology supports intervention-based research. PrOH Modelling enables users to draw out systemic success factors for change that can catalyse innovative and context-sensitive change, creating new management tools and improving process efficiency and overall operational effectiveness.

What makes PrOH Modelling unique?

These researchers explain how PrOH Modelling uses holons as building blocks. A holon is a model of a human activity system, such as a change system for a business process. It includes all the essential systems thinking principles and forms part of a larger system. Additionally, a holon can contain other systems. These holons can be joined together to form a set of PrOH Models called a holarchy.

A holarchy is used to visualise the emergent or hidden properties of socio-technical systems, sub-systems, and meta-systems simultaneously in multiple layers. PrOH Models can also be used as a storyboard or as a game to create engaging change management workshops. The PrOH Game© can be seen on prohmodeller.org.

Abstraction and enrichment

The use of abstraction and enrichment of holons to build a holarchy of sytemic change models is what makes PrOH Modelling different and more effective at modelling change than other modelling methodologies that use aggregation and reduction.

PrOH Modelling uses enrichment to build deeper understanding of complex high-level processes and information systems by constructing holarchies of models with details of specific aspects shown in lower-level models. Abstraction is the opposite of enrichment, so given the details (eg, in an operational model), a concise overview is provided in higher-level models, such as tactical level or higher strategic level models.

Modelling with abstraction and enrichment exposes properties relative to the level of the model. PrOH Modelling includes descriptions of different observed behaviours at different organisational levels that may not be observed otherwise. This means that PrOH Modelling can be used to build sets of models about systemic success factors of change, both hidden at increasingly lower levels, and emerging at increasingly higher levels, within people-centric organisational change systems.

Changing organisational practice

PrOH Modelling Methodology is best suited to action research that involves making changes to organisations' practice. It contributes to systems thinking methodology as well as adding to the general theory of those areas being investigated, eg, productivity and digitalisation.

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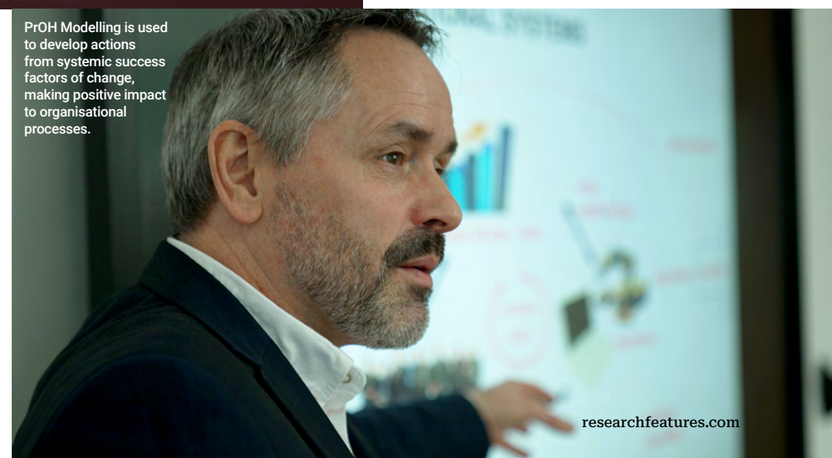
For example, PrOH Modelling has been used to change legal services that were often criticised for not being effective, efficient, and economical. However, since the Legal Services Act 2007 that deregulated the UK legal market, legal firms have had to become



PrOH Modelling is used to develop actions from systemic success factors of change, making positive impact to organisational processes.

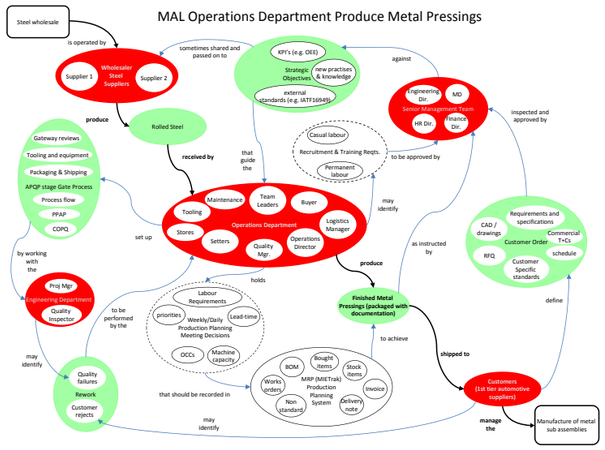
increasingly market-focused. The Legal Services Act 2007 has allowed retailers such as supermarkets to offer legal services. Thus, getting legal advice becomes 'as easy as buying a can of beans' and this has had implications for small- and medium-sized organisations, making them vulnerable to new players in the market. Incumbent players have had to become more digitalised, leaner, and more market responsive. PrOH Modelling was used to good effect to achieve such outcomes in a mid-sized law firm.

Training courses on PrOH Modelling available at prohmodeller.org are suitable for academic researchers, practising change managers, and change consultants.

Improving a people-centric organisation

A review of the literature exposes a lack of research into developing and applying operations management theory in professional service settings and, specifically, within law firms. To show how action research together with PrOH Modelling can help bridge this gap, these researchers have carried out an in-depth study of a UK law firm offering a range of legal services that employs more than 250 staff.

Dozens of interviews, workshops, and focus groups were carried out over a two-year period involving a variety of staff – from secretaries to senior partners in action research cycles. Analysing data collected during these activities identified needs for innovative improvements in areas such as operational efficiency, pricing, service delivery, and people management.



PrOH Modelling focuses on the system of change for a process (with its systemic success factors) and not the process itself.

PrOH Modelling revealed design choices for operational process changes leading to the development of significant innovations that have been rolled out at both department and firm level and resulted in improving the company's operational and financial performance. Furthermore, participating in the action research activities improved employees' attitudes towards organisational change.

This application shows how we can use PrOH Modelling in cycles of action research to make improvements to an organisation – particularly, where the initial research problem is neither fully understood nor defined. Cycles of action research enable iterative changes to be made as the knowledge increases.

> **PrOH Modelling users will become creators of impactful action research and actively contribute to practice-based theory and the wider systems thinking community.**

PrOH Modelling can enable a bottom-up approach, starting with operational issues; or a top-down approach, beginning with a strategic issue; or modelling topic-by-topic, phase-by-phase in a middle-out approach, whichever is most useful. Clegg believes that PrOH Modelling's flexibility and focus on the systemic success factors of change enables its users to become creators of impactful action research and actively contribute to practice-based theory and the wider systems thinking community.

Dozens of successful cases have been published in academic journals and presented at academic conferences. The PrOH Tool© is now available to use to convert structured data into a PrOH Model. Case studies and further details can be seen on prohmodeller.org.

Details

Professor Ben Clegg

Dr Krishna Balthu

e: b.t.clegg@aston.ac.uk
w: www.prohmodeller.org

Bio

Professor Ben Clegg is a senior partner in prohmodeller.org and Professor of Operations Management and Systems Thinking at Aston Business School, Birmingham, UK. Ben has been researching, teaching, and consulting using systems thinking methods for most of his career. He is the lead thinker and instigator behind the novel PrOH Modelling Methodology developed at Aston University. His PhD was one of the first published works on PrOH Modelling; since then, he has published widely on PrOH Modelling, operations management, and organisational improvement.

Dr Krishna Balthu is partner in prohmodeller.org and Lecturer in Operations Management and Systems Thinking at Aston Business School. Krishna has worked as a consultant and change manager in knowledge-intensive organisations for over a decade prior to teaching at Aston. He has delivered an award-winning research project funded by Innovate UK and continues to work on industry-based research projects. His work has been published in respected academic journals and he is committed to advancing the field of systems thinking through his research and teaching. His PhD used PrOH Modelling through action research in a law firm.

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Collaborators

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Further reading

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Competing interest statement

This work has been inspired by the work of Professor Peter Checkland and his soft systems methodology and by Peter Senge's book, *The Fifth Discipline*. However, the work on PrOH Modelling stands apart from these previous works and makes an independent novel contribution to the field.

PrOH MODELLING METHODOLOGY

Aston University BIRMINGHAM UK

Personal response

What inspired you to take a holonic approach to PrOH modelling?

Clegg: Having worked in large engineering and manufacturing organisations as an intern, I became aware that many managers applied very mechanistic methods to designing non-mechanistic systems such as organisational structures and processes to try to change the way people worked and behaved. I observed that this thinking was often a misapplication of methods and many managers were unaware of soft systems thinking.

The effect of this misapplication was often a lack of engagement from employees, overly bureaucratic thinking, and ineffective outcomes. In contrast, systemic thinking using holonic models, I found, helped to bring about organisational change without being mechanistic and reductionist. As a result, employees were far better engaged in the change management process and were able to focus on the systemic success factors of change within a change system.

Therefore, I thought, a new way of thinking about change was required. A softer approach was needed. This inspired me to do a PhD in this area. The result, amongst other practical outputs, was the PrOH Modelling Methodology. Since then, for over 20 years, I have been using PrOH Modelling to good effect in a variety of different organisations.

What has been the most challenging aspect of this research?

Clegg: Action research is always challenging because action researchers have to address industry-based problems that require practical solutions. Simultaneously, action researchers have to satisfy academic requirements of methodological rigour and expression of that industrial problem in a wider, more generalisable theoretical context so that others may learn from their action research examples. Ideally, action research should bridge the separate worlds of practice and research together, but it can occasionally, if done incorrectly, result in researchers being alienated from both communities unless an engaging and appealing approach is used. Systems thinking methodologies can build a bridge to help conduct valid and verifiable action research that allows action researchers to solve practical problems and be able to have reflective thoughts to abduct to and rationalise their observations within relevant theoretical contexts.

Another aspect difficult to convey is the difference between modelling 'as-is and to-be' models; and modelling the 'system of change with its systemic success factors'. Making modellers realise what they are trying to model has been revelatory for some modellers who have described this as an 'epiphany', as they hadn't ever really thought about what they were modelling and why they were doing it. 'As-is' and 'to-be' states of models are often built to be faithful representations of a real-world process whereas soft systems models are most useful in creating insight into a conceptual model of the system of change that turns an 'as-is model into a to-be model'. This seemingly subtle difference is radical once users realise that a system of change is temporal, intangible, subjective, politically sensitive, and parsimonious, and at best, a defensible representation of what 'should-be' happening – quite different from the model of an actual organisational process. Unlike harder models of real-world operational processes which need to be faithful representations of the process, a model of a change system is different; it is conceptual and needs to show systemic success factors of change and cannot actually ever be a faithful representation of a real-world system because it is only conceptual – held collectively within the minds those making the change.

Why do you think that people's orientation towards both operational improvement and wider organisational change improved after their participation in these action research activities?

Clegg: To make organisational change effective, those who work in the organisation must own the problem, be part of the change journey, and genuinely want to sustain positive change once it has been made. This can sometimes be a painful and lengthy ongoing experience, which is best done in short, repeated cycles rather than in a longer project. Part of the challenge to making this work is getting people involved, to hear different perspectives from multiple tenable viewpoints and build consensus to place actions on employees to achieve suitable, measurable, and time-bound changes. The PrOH Modelling Methodology possesses these features and helps those involved, whether from the academic or industrial side of the challenge, to be open-minded systems thinkers who are able to come-up with innovative solutions to problems. Solutions often come from the combined use of theoretical insights, practical skills, and context-specific insights.

For instance, working on one project to improve productivity in a metal working factory involved lean six sigma theory, the practical application of digital sensors and new cloud-based software, and the imaginative creation of a virtual reality training game to help workers reduce set-up times on press machines. Both the problem, the actions taken, and the solutions were multi-faceted, interdependant, and better understood once a simultaneous, multi-level systemic analysis had been conducted – in this case using PrOH Modelling.

PrOH Modelling, although rigorous, academically based, and practical, can also be fun to do and appeals to the artistic side of process modellers, and is definitely something that change managers can use in productive change management workshops. More details of PrOH Modelling, the PrOH Tool© and the PrOH Game© can be seen on prohmodeller.org. Please visit the website and sign up to join the PrOH Modelling community.