



**Proceedings of the 16th
UK System Dynamics Chapter
annual conference**

Theme : Operational risk and analytics

**3rd April to 4th April, 2014
London School of Economics**

Timetable and contents

Thursday 4th April	
12:30	Registration and light refreshments
13:30	Welcome by Chapter President
13:40	Modelling global risk from resource scarcity Dr Aled Jones (Global Sustainability Institute)
14:20	Managing risk wisely – and holistically – at Ofqual Tim Leslie (Ofqual) Dr Dennis Sherwood (The Silver Bullet Machine Manufacturing Company Limited)
15:00	Discussion on operational risk Dr Bob Thurlby
15:10	Tea / coffee
15:40	Big Data, Analytics & System Dynamics: The Red Pill or the Blue Pill? Michael Mortensen, Prof Stewart Robinson, Prof Neil Doherty (Loughborough University)
16:20	Bridging the Gap – systems models linking consumer behavioural insights to coherent strategic planning Dr David Exelby (Decision Analysis Services Ltd) Vittorio Raimondi (Foresight Associates)
17:00	Discussion on analytics Dr Siôn Cave
17:30	Wine reception in NAB – outside Wolfson Theatre
18:30	Optional dinner at Coopers Restaurant
Friday 4 April (Room 2.04, New Academic Building)	
9:00	Arrivals – coffees and teas
9:15	Interactive Workshop - Collaborative workforce planning in the NHS Peter Lacey (Whole Systems Partnership)
11:15	Coffee break
11:30	Debrief on Workshop
12:00	PhD Poster session : student introductions
12:30	Buffet lunch + PhD poster session – cont'd
13:00	Chapter AGM This short session will report on the status and activities of the UK Chapter, and provide an opportunity to elect new representatives to the Policy Council
13:30	Student presentations and student prize award
16:00	Close

Introduction

Welcome

A warm welcome to all delegates at our 2014 Annual Conference. This year has a theme of 'Operational Risk and Analytics' and comprises four talks on Thursday afternoon from several perspectives in applied consultancy work and research. On Friday morning we have an interactive workshop based on workforce modelling in the healthcare sector.

I would like to thank the UK System Dynamics Policy Council for their contribution over the last year and to arranging this event. We decided to alter the venue and date for this year and welcome any comments you may have to help shape future events.

Many thanks and hope you enjoy the conference.

Dan Arthur (President of the UK Chapter of the System Dynamics Society)

UK Chapter of the System Dynamics Society policy council

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Presentation Abstracts

Modelling global risk from resource scarcity

Dr Aled Jones (Global Sustainability Institute)

The dependency of the world economy on natural resources and the environment is not properly addressed by current economic models. While economic theory has advanced to include environmental impacts not traditionally considered as being a direct part of economic activity ('externalities') these models are either not transparent, do not model physical limitations or do not take into account the systems links and feedback in the natural world. Therefore, the models are not good as initial decision making tools to guide the choice for sustainable policy measures in different countries.

The Global Resource Observatory (GRO) modelling project is a pioneering methodological approach which exploits Systems Dynamic (SD) theory and Agent Based Model (ABM) techniques in a hybrid model. Grounded in empirical data, this novel approach allows for significant advancement in understanding the quantitative relationships involved in the environment– economy – society nexus. System Dynamics (SD) models provide a representation of the world through stocks and flows, and can incorporate the effect of feedback loops and time delays on outcomes. Agent based modelling (ABM) on the other hand captures the nonlinear and non-rational behaviour of different actors in a complex system. ABMs model the decision making process of 'agents' (people or organisations) within a system to provide information on how the system's properties emerge from the interactions of its parts.

Dr Aled Jones FRSA FIMA is the inaugural Director of the Global Sustainability Institute (GSI) at Anglia Ruskin University. The GSI's research is focused around personal motivations and systems change set against the challenges of sustainability. Dr Jones's research particularly focusses on the finance sector and government and how they will respond to the impacts of global resource trends and climate change. Dr Jones chaired a working group on climate finance within the Capital Markets Climate Initiative (CMCI) on behalf of Greg Barker, the Minister for Climate Change in the UK Department for Energy and Climate Change (DECC) and sits on the steering group for CMCI. He is a Managing Director for the P80 Group Foundation which in 2012 signed the Little Rock Accord with Club de Madrid to help facilitate global investments into climate change solutions.

Managing risk wisely – and holistically – at Ofqual

Tim Leslie (Ofqual)

Dennis Sherwood (The Silver Bullet Machine Manufacturing Company Limited)

During 2013 Ofqual commissioned a study to use systems thinking to gain a greater understanding of the complex systems in which Ofqual operates, and to use that understanding to help inform the making of well thought-through policies (such as in relation to the proposed changes in GCSEs), to avoid ‘unintended consequences’, and to manage risk as wisely as possible. This presentation will tell some of the stories.

Tim Leslie is Ofqual’s Director of Strategic Reform. Reforming the qualifications has provided Ofqual with an excellent opportunity to tackle some of the key risks that exist in the current qualifications market – a topic to which Tim is no stranger, having formerly held senior risk management positions at Standards for England, Xansa, the Payments Council and the Financial Services Authority.

Dennis Sherwood is MD of his own company, The Silver Bullet Machine Manufacturing Company Limited, and is the author of nine books, including ‘Seeing the Forest for the Trees – A manager’s guide to applying systems thinking’.

Big Data, Analytics & System Dynamics: The Red Pill or the Blue Pill?

Michael Mortensen, Prof Stewart Robinson, Prof Neil Doherty (Loughborough University)

Growing interest in analytics presents a dilemma to the systems dynamics community. On the one hand there is great synergy between each as practices that use mathematical processes to better understand real world phenomenon, predict future events, and improve business decision making. On the other, analytics is closely associated with 'Big Data' and the ever increasing amounts of information now available whereas system dynamics emphasise structure over data and often use less "hard" information sources. To explore the relationship between the two this presentation seeks to better define analytics through consideration of how it is employed in practice, and how it differs from decision support systems, business intelligence and similar. The findings suggest that the growth of analytics may provide opportunities for system dynamics to increase its usage and reach, and seeks to encourage further research and debate into how further association can benefit both communities.

Michael Mortenson: is a current doctorate candidate at Loughborough University researching the development of analytics education in UK universities. He holds an honours degree from Middlesex University and an MSc in e-Business Management from Warwick University. Prior to returning to academia he has worked for several years in marketing and ecommerce in the travel industry and in recent years has worked as a consultant providing digital marketing and analytics services to a variety of companies. His research interests and specialisms include business analytics, marketing/digital analytics, e-business and internet retailing. Michael has also presented as a guest lecturer on a variety of topics at Warwick and Oxford Brookes University. Website: www.whatisanalytics.co.uk

Stewart Robinson is Professor of Management Science and Associate Dean Research at Loughborough University, School of Business and Economics. Previously employed in simulation consultancy, he supported the use of simulation in companies throughout Europe and the rest of the world. He is author/co-author of five books on simulation. His research focuses on the practice of simulation model development and use. Key areas of interest are conceptual modelling, model validation, output analysis and alternative simulation methods (discrete-event, system dynamics and agent based). Stewart is co-founder of the Journal of Simulation and the Simulation Workshop conference series. He helped lead the development of the first OR-based Masters course in Analytics in the UK and currently he is helping to lead an OR Society Charitable Project on Analytics Education. Stewart is President of the Operational Research Society. Home page: www.stewartrobinson.co.uk.

Professor Neil F. Doherty currently holds the Chair in Information Management in the School of Business and Economics, at Loughborough University. In addition to business analytics, his research interests include: benefits management; IT for improved competitive positioning; information security management; and the impact and uptake of electronic commerce. Neil has had papers published in a range of academic journals, including: European Journal of Information Systems; Journal of Information Technology; Journal of Strategic Information Systems; IEEE Transactions in Engineering Management; Journal of Business Research; European Journal of Marketing; Journal of Marketing Management; Information Technology & People; Behaviour & IT; Information Systems Journal; and Information & Management. Neil is currently serving as a Senior Editor for the Information Systems Journal, and as an Associate Editor for Information Technology and People.

Bridging the gap – Systems models linking consumer behavioural insights to coherent strategic planning

Dr David Exelby (Decision Analysis Services Ltd)

Vittorio Raimondi (Foresight Associates)

Many consumer-based enterprises are sitting on large data repositories of consumer intelligence – both transactional and market research-derived. We have found firms typically underuse this data for robust strategic planning – focusing on more tactical opportunities and performance management.

Systems modelling approaches can help in the design of strategic planning frameworks that in turn can drive focused data mining of these data sources. The insights and processes that arise from such an approach yield valuable benefits for the firm. These include a common language for planning, coherent data for modelling and planning tools that enable brand teams to create actionable plans.

We will describe the application for global brand owning companies which have adopted this systems-based strategic planning across all their markets and share our experiences in introducing the approach and supporting its development.

Dr David Exelby is a managing consultant with Decision Analysis Services Ltd (DAS). DAS is a team with a shared vision of solving strategic challenges facing government and industry decision makers. DAS offers novel solutions to our clients across a diverse range of sectors based on our expertise in strategic management, cost analysis, risk management and systems modelling. David has over 17 years experience in the application of systems thinking and system dynamics as part of strategy consulting to government and private sector clients. Clients include those within oil and gas, electricity, pharmaceuticals sectors and global brand owners of consumer goods. Government consulting has focused on defence analysis for UK MoD and USA DoD. David has been a policy council member of the International System Dynamics Society, is a founder of the UK SD Chapter and is an experienced SD trainer.

Friday Interactive Workshop:

Collaborative workforce planning in the NHS

Peter Lacey (Whole Systems Partnership)

This session will replay an interactive exercise undertaken by teams from Local Education & Training Boards who are part of a growing Workforce Modelling Collaborative. Locality teams made up of clinicians and senior workforce planners used simulation tools to explore training requirements in the light of future demand using tools that were sensitive to their local context and that gave opportunity for benchmarking and comparison.

You will learn about the development process that led up to the event and then replay the exercises and consider the learning and benefits from this collaborative approach.

Peter Lacey has undertaken strategic consultancy work in the UK using systems thinking and system dynamics modelling for over 15 years. He founded the Whole Systems Partnership (WSP) in 2002, since when the company has undertaken work for a wide range of local, regional and national organisations. This work has included modelling the community and hospital interface, capacity requirements for social care and population health modelling projects for dementia, end of life care and services for frail older people. Most recently WSP have formed a Workforce Modelling Collaborative, with 12 out the 13 Local Education and Training Boards in England expected to be members from April 2014.

Peter is an active member of the System Dynamics community in the UK and internationally, he has an MBA from Durham Business School and has recently completed an MA in Applied Professional Ethics from the University of Leeds. He is married with four grown up boys, recently replaced by a brood of laying chickens.

Student contribution

Presentations

The dynamics of public trust in a business organisation: perspective from a focus group of business consultants

Beth Louisa Powell (Lancaster University)

Exploring frameworks for mixing Discrete Event Simulation and System Dynamics methods in theory and in practice

Jennifer Morgan (University of Strathclyde)

PhD Posters

A simulation approach to the evaluation of shared service centres

Gregory Asante (University of Bedfordshire)

JOHARI window script classification for Group Model Building contribution

David Carter (Plymouth University)

A Study of Operational Noise in High-Value Manufacturers Production Systems

Mohammed Shararah (Cardiff Metropolitan University)

Notes