

ICoSS Project

(Integration of Complex Social Systems)

A 3-year EPSRC-funded collaborative research project working with **Shell Internet Works**, **Rolls-Royce Marine**, **BT's** Research Department and new business incubator, **Brightstar**, and **JBA Consulting**, who will help with dissemination of the findings.

AIM: To co-create, with our industrial partners, new organisational forms, after:

- a merger or acquisition;
- restructuring; and
- the spinning off of a new business.

Funded under the EPSRC Systems Integration Initiative programme, the ICoSS research project will study:

- the integration of *national, business, cultural, and technical systems* in the emergent organisational forms;
- the role of *information and computer technologies* (ICTs) in facilitating connectivity and the exchange of '*knowledge*'.

OBJECTIVES

1. To identify and articulate the ***conditions that enable and inhibit*** the creation and sustainability of new organisational forms, able to co-evolve with a changing environment, thus reducing the need for constant restructuring.
2. To co-create with our industrial partners, ***company-specific frameworks*** of enabling infrastructures (cultural, social and technical conditions that facilitate 'x').
3. To encapsulate the results in ***generic frameworks***, analytic tools, diagrams and supporting computer-based models.
4. To explore processes for the ***sharing of knowledge*** within the industrial partners.
5. To develop a ***theory*** and a ***methodology*** based on the principles of complexity.
6. To contribute to a ***business language*** that allows line managers to use complexity concepts in practical contexts.

OUTLINE

- The project will use a combined approach based on **action research** involving '*natural experiments*' and conventional practice studies such as case studies, interviews and opinion surveys for evaluation.
- *Natural experiments* are new ways of working and relating which have emerged from the existing organisation, and are different from the dominant culture.

- Research partners should expect *benefits* to accrue *in a continuous stream* throughout the life of the project, not just at the end.
- The project will provide practitioners with a *new conceptual framework*, while testing and refining the theory in practice.
- A multi-disciplinary group of *International Expert Advisors* from *academia* and *business* will contribute different perspectives, knowledge and expertise.

RESEARCH TEAM

Principal Investigator: **Eve Mitleton-Kelly**

founder and Director of the Complexity Research Programme, LSE;
Executive Co-ordinator and Director of SOL-UK (London).

Co-investigators:

Prof. Ian Angell

Professor of Information Systems, LSE, and

Prof. Frank Land

Visiting Professor of Information Management, LSE and
Leeds Metropolitan University

Project Manager:

Dr. Steve Nicholson

formerly Director of Global Transformation, Reckitt & Colman;
now an independent consultant.

Modelling Expert:

Dr. Ugur Bilge, who will build the models and simulators.

Artist:

Julian Burton, who will illustrate concepts and discussions.

Researchers:

Nazreen A. Subhan, Kate Hopkinson, Declan Barry.

Research Officers:

to be appointed.

Administrator:

Slavica Savic

who has been working in the Complexity Group since 1998, running its
seminars and workshops.

The Research Team is part of the **Complexity Group**, within the LSE's Information Systems Department. The Group has attracted **research funding** from: BT, Citigroup (New York), GlaxoWellcome UK, the Humberside TEC, Shell, World Bank (Washington DC) Zeneca, and the EPSRC on four research projects

INTERNATIONAL TEAM OF ADVISORS

PROFESSORS:

John L. Casti: Santa Fe Institute, New Mexico and IIASA in Vienna. Executive Editor of the Journal "*Complexity*". He will advise on modelling and simulation.

Chris Clegg: Institute of Work Psychology, University of Sheffield, will advise on organisational psychology and human factors.

Raul Espejo: Prof. of Information Systems, Lincoln School of Management. Has been awarded an EPSRC grant for a network on 'Systems and the Information Society'. The network and ICOSS address complementary issues and will benefit from a strong link.

Rachel Harrison: Prof. of Computer Science, University of Reading. Will advise on e-collaboration.

Bill McKelvey: Prof. of Strategic Organizing at the Anderson School at UCLA, USA. He will advise on socio-technical systems design and on the application of complexity theory and emergent structure, and computational agent-based adaptive-learning models.

Luciano Pietronero: Prof. of Solid State Physics, Department of Physics, University of Rome “La Sapienza” and Director of the INFM Unit, which consists of 200 theoretical and experimental scientists in the area of Condensed Matter. He is a member of the European Network TMR on Fractal Structures and Self-Organisation. He will advise on developments in complex systems in physics and the other natural sciences.

Alan Wilson: Geographer and Vice-Chancellor, Leeds University. There are many industrial situations in which mathematical modelling is a critical component of optimal developments. Prof. Wilson has articulated this task in his recent book (*‘Complex spatial systems: the modelling foundations of urban and regional analysis’* 2000) and will contribute by helping to connect this toolkit to complexity theory.

BUSINESS ADVISORS:

Arie de Geus: ex-Shell and author of the ‘Living Company’. Formerly Head of Planning at Royal Dutch/Shell and a founder of the Society for Organisational Learning (SOL), is well known for his ability to put over novel concepts to top business and government leaders and will contribute in this capacity.

Gerard Fairtlough: founder and ex-CEO of Celltech, and author of ‘Creative Compartments’. Has been working with the LSE Complexity Group to develop the ‘Complexity Game’, which provides experiential learning of some complexity principles. He has long experience of business and of putting research findings to practical use and will contribute by advising on the development of business games, on the application of complexity and on the methodology.

Peter Fryer: was Chief Executive of Humberside Training and Enterprise Council (TEC). Peter has based the management, leadership and organisational principles of the TEC on the application of complexity. He will lead the project’s initiative on disseminating the findings to the Small Business Service, and to the media, particularly TV. The TEC has been a member of the LSE Complexity Programme since its inception and a case study is being written on the development of the TEC as a ‘complex evolving system’.

Frances Storr: organisational psychologist with the TEC. She has been a key player in the profound culture change that has been happening at Humberside TEC and in translating complexity theory into practical approaches.

Peter Fryer and Frances Storr will both work with the collaborators to apply the lessons learned at the TEC on the application of the principles of complexity.

ICoSS METHODOLOGY

- Has a preparation stage and **3 phases**.
- Will use the **principles of complexity** to offer a new perspective in the creation and ‘design’ of new organisational forms, able to co-evolve with a changing environment, thus reducing the need for constant restructuring.
- Is a combination of various methods, approaches and tools, within the socio-technical tradition.

- Some have been developed and tested in Complexity Group projects, while others will be adaptations from existing methods.

Phase 1 will gain understanding of the current state, through:

- semi-structured interviews
- workshops
- analysis of data using the principles of complexity
- computer models and simulators

Phase 1 output: *co-creation of an enabling infrastructure with each partner*

Phase 2: trial, implementation and embedding of the enabling infrastructures

- All partners will be supported by the research team, advisors and the other industrial partners.
- Monthly telephone conferences and regular meetings will monitor progress and identify any problems.
- A second set of interviews will focus on the implications and consequences of implementation.

Phase 3 (in parallel with Phase 2) will document the outputs and focus on dissemination and exploitation.

The teams will be supported throughout the 3-year project by:

- in-company and inter-organisational meetings
- workshops
- Steering Group
- Dissemination & Exploitation Group
- International team of Advisors

OUTPUTS

1. **Generic frameworks** of conditions, which enable the emergence of new organisational forms.
2. **Company-specific frameworks** of enabling infrastructures based on the pilots.
3. **A methodology** for identifying and analysing these conditions, to include:
 - a) characteristics of success, and process and outcome measures
 - b) criteria of ‘fitness’ for the pilot
4. A well documented **process of implementation**.
5. A communications plan for **dissemination** to the rest of the organisation.
6. **Management handbook**, to include 1-5 above and a **lexicon of terms**.
7. **Diagnostic tools** that enable any organisation to identify:

- a) the **appropriateness and relevance** of the ICOSS methodology to a given organisational challenge
- b) the **‘maturity’ or readiness** of the different parts of the organisation and its extended enterprise
- c) where, when and how best to introduce the methodology – **criteria for choosing pilots**

8. An **Executive Summary** of the above

9. **Educational tools** including computer simulation models to experiment in a safe (i.e.simulated) environment.

10. A **web-enabled knowledge-base**, which could be imported into company intranets, introducing complexity thinking, summarising the research findings, and offering recommendations, implications, diagnostic tests.

11. Educational and **promotional material for dissemination** to the **wider community**

12. A **language, concepts** and a **way of thinking** more in tune with the new economy.

INVOLVEMENT

- Interviewees: 1.5 hours
- Core team: 5-10 days to attend workshops, presentations, etc. This will depend on individual commitment and time.

SEMINARS, etc

- To gain some understanding of complexity and its application, partners are invited to attend the Complexity Seminars, details on: www.lse.ac.uk/lse/complex

Further details on Complexity Group activities www.lse.ac.uk/lse/complex; and from the Administrator S.Savic@lse.ac.uk

Details on involvement in the project, from the Principal Investigator Eve Mitleton-Kelly E.Mitleton-Kelly@lse.ac.uk