Friday 23rd February 2007

Venue: SMART lab: MAGIC Research Group, University of East London.

Overview of the Embracing Complexity in Design 2 D21C Cluster
Professor Jeffrey Johnson

Introduction

Embracing Complexity in Design is a unique British research programme with the objective of understanding the part played by complexity science in design, and increasingly the potential for design to play a major role in the emerging science of complex systems. As a result of support from the *Designing for the 21st Century* research programme, the UK is now a recognised world leader in this field. This project will carry this research forward by posing and beginning to answer a new programme of research questions.

The Research

The research programme builds upon the considerable momentum built up by the group. Our previous project established four areas in which design and complexity interact: (i) many designed systems are complex, and the science of complex systems is required to understand their behaviour; (ii) many design processes are complex, including methods of fabrication, materials, and supply chains; (iii) the environment of design is complex, including regulation, and socio-economic forces such as markets and fashion; and (iv) the design process itself forms a complex human system involving the creation and communication of voluminous heterogeneous information mediated by new ICT technologies enabling people to interact and collaborate locally and globally in completely new ways. In this context the project will address the research questions:

1. how can the science of complex systems inform designers, and how can design, as a science of the artificial, inform research into complex systems?
2. how are, or how could, the methods of complex system science be used in the production or implementation of designed systems?
3. How do designers deal with the socio-economic and legislative context of design, and how might the methods of complex systems science be used to support designers in this respect?
4. how can the methods of complex systems science be used to investigate the design process as a complex socio-technical systems, and how can them methods use by design researchers to study the design process be generalised to inform complex systems research as a science of the artificial?
5. How do the four areas discussed about interact as a system of systems, and how do designers deal with the great uncertainty and complexity this entails. How can design, as a science of the artificial, be seen as model for complex systems researchers motivated by applying complexity science in particular domains?

The *objective* of the research is to provide state-of-the-art answers to these questions and to synthesise them into a book which will be a unique and authoritative resource for both the design and complex systems community. This book will be supported by web-based resources accumulated during the project.

Before this, the draft findings will be presented at the European Conference on Complex Systems (ECCS'07) in Germany. The 2005-2006 *Embracing Complexity in Design* cluster ran a highly successful workshop at the European Conference on Complex Systems (ECCS'05) in November 2005 [1]. The cluster will run a similar workshop at ECCS'06 in September 2006 with support from the Open University. This application includes an allowance for members to attend ECCS'07 in Dortmund to present our draft finding and to get state-of-the-art input from the wider complex systems community.

Management

Jeffrey Johnson is Professor of Complexity Design at the Open University. He has published widely on complexity and design. He is leader of the € 1 M European Coordination action ONCE-CS (Open Network of Centres of Excellence in Complex Systems), is PI on an EPSRC project to produce a Taught Course on 'Mathematics in the Science of Complexity', and was PI on the AHRC/EPSRC 2005-2006 *Embracing Complexity in Design* Designing for the 21st Century Research Cluster.

Eve Mitleton-Kelly is Director of the Complexity Research Programme at the London Schools of Economics. She is a member of the 2003-2006 € 1.5 M EXYSTENCE Coordination Action funded by the EC, and has responsibility for organising research meeting between complex systems researchers and industry. She has published widely on complexity in the design and management of organisations including 'Designing a New Organisation: A Complexity Approach', Journal of the European Conference on Research Methods, 2005. Her role on the project is to bring a perspective on complex systems from the social and organisational sciences.

Alec Robertson is a Principle Lecturer in design at DeMontfort University. His role on the project is to connect the research with the design practitioner community, and 4D design. He has expertise in organising design and research events. He organized the ECiD 1 Finale Event *More is More* at Royal College of Art in December 2005.

Katrina Alexiou is Research Fellow in Design and Innovation at the Open University. Her role on the project includes bringing a design research perspective.

Theodore Zamenopoulis is Research Fellow at the Open University. His role is to bring a design research perspective to the project and he will act as rapporteur at the meetings, and assist in the project administration.

ECiD	Information, personnel and links: W: http://www.complexityanddesign.net E: (Jeffrey Johnson) *j.h.johnson@open.ac.uk*