

Shaping the Community for Complex Systems Science and Policy

Jeffrey Johnson

Open University – UK

OU Complex Systems – Paris

Complex Systems Society – Europe

(EC - FET - ICT)

Coordination Actions

2003 - 06 Exystence (FP5)

2005 - 08 ONCE-CS (FET) GIACS (NEST) (FP6)



2004 - Complex Systems Society

Coordination Actions

2003 - 06 Exystence (FP5)

2005 - 08 ONCE-CS (FET) GIACS (NEST) (FP6)



2004 - Complex Systems Society

2008 – 11 New CAs (FET Proactive, FP7)

New STREPS & IPs (FET, FP7)

EC has enabled Europe to be well networked

More to do at international & national levels

Coordination Actions

2003 - 06 Exystence

2005 - 08 ONCE-CS (FET) GIACS (NEST)

2004 - Complex Systems Society

2008 – 11 New CAs (FET Proactive)

New STREPS & IPs (FET)

New Education networks/projects

EC has enabled Europe to be well networked

More to do at international & national levels

European 7th Framework Programme

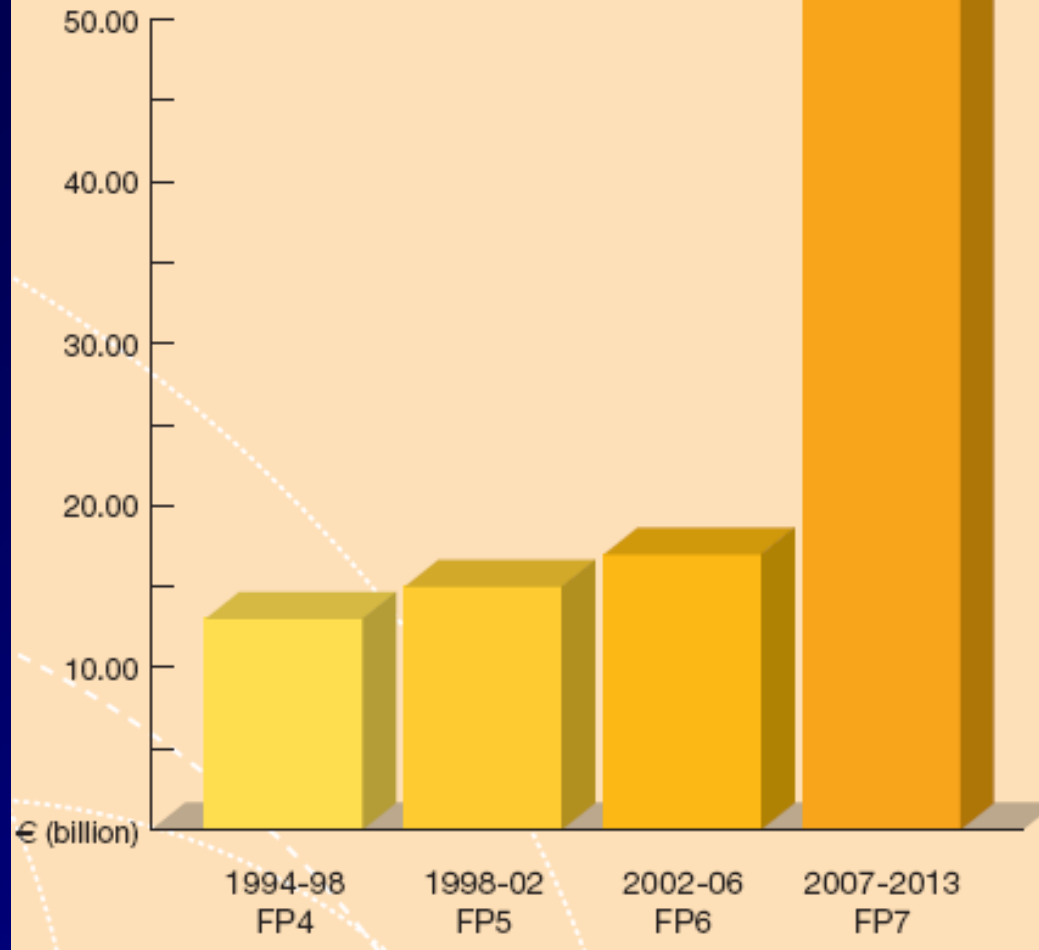
The screenshot shows a web browser window with the following elements:

- Navigation Bar:** Includes a logo with colored squares (blue, red, orange, purple, pink, green, light blue) and links for "About | What's New? | Sitemap". A "Quick Links" dropdown menu is visible on the right.
- Breadcrumbs:** "Europa > [CORDIS](#) > [FP7](#) > Understand FP7".
- Left Sidebar:** A list of navigation options:
 - FP7 Home
 - FP7 newsroom
 - **Understand FP7** (highlighted)
 - Participate in FP7
 - Find a call
 - Electronic proposal submission system (EPSS)
 - Get support
 - Find project partners
 - Find a document
- Main Content Area:**
 - Section Header:** "Understand FP7" (highlighted).
 - Section Title:** "The main objectives of FP7: Specific programmes".
 - Text:** "Knowledge lies at the heart of the European Union's Lisbon Strategy to become the **'most dynamic competitive knowledge-based economy in the world'**. The **'knowledge triangle'** - **research, education and innovation** - is a core factor in European efforts to meet the ambitious Lisbon goals. Numerous programmes, initiatives and support measures are carried out at EU level in support of knowledge.
 - Text:** "The **Seventh Framework Programme (FP7)** bundles all research-related EU initiatives together under a common roof playing a crucial role in reaching the goals of growth, competitiveness and employment;"
- Right Sidebar:** A list of related links:
 - What is FP7?
 - Roadmap to FP7
 - The Debate
 - Budget
 - Related



The broad objectives of FP7 have been grouped into 4 categories: **Cooperation**, **Ideas**, **People** and **Capacities**. For each type of objective, there is a specific programme corresponding to the main areas of EU research policy. All specific programmes work together to promote and encourage the creation of European poles of (scientific) excellence.

Evolution of EU Research Framework Programme Budgets



FP7 Budget

€ 53.2
billion

2007-2013

FET: Future and Emerging Technologies

FET Home

Areas & Projects

Areas

Projects

Open Consultation

Events

Open Calls

Documents & Links



Contacts

FET in the media

Complex Systems (CO): Funded Projects

- [STREP Projects funded by the "Simulating Emergent Properties in Complex Systems initiative"](#)
- [Integrated Projects funded by the "Complex Systems" Proactive initiative *](#)
- [STREP Projects in the area of "Complex Systems" funded via the Fet Open Scheme](#)

STREP Projects funded by the "Simulating Emergent Properties in Complex Systems initiative"

COAST: Complex Automata Simulation Technique

Proj. Number: 033664

[Project home page](#)

EMIL: Emergence In the Loop: simulating the two way dynamics of norm innovation

Proj. Number: 033841

➤ [Project Fact Sheet](#) (PDF)

agents:

EURACE: An agent-based software platform for European economic policy design with heterogeneous interacting new insights from a bottom up approach to economic modeling and simulation

Proj. Number: 035086

➤ [Project Fact Sheet](#) (PDF)

GENNETEC: NETworks Emergence and Complexity

Proj. Number: 034952

➤ [Project Fact Sheet](#) (PDF)

PERPLEXUS: Pervasive computing framework for modeling complex virtually-unbounded systems

Proj. Number: 034632

➤ [Project Fact Sheet](#) (PDF)

TAGORA: Semiotic dynamics in on-line social communities

Proj. Number: 034721

➤ [Project Fact Sheet](#) (PDF)



Integrated Projects funded by the "Complex Systems" Proactive initiative

DELIS* : Dynamically Evolving, Large Scale Information Systems

[Project Homepage](#)

ECAgents* : Embodied and Communicating Agents

[Project Homepage](#)

EVERGROW * : Ever-growing global scale-free networks, their provisioning, repair and unique functions

[Project Homepage](#)

PACE * : Programmable Artificial Cell Evolution

[Project Homepage](#)

Some examples of STREP projects in the area of "complexity" funded via the Fet Open Scheme:

We have a number of projects which elaborate various aspects and potential benefits of a complex system approach. The OPEN scheme will continue to accept project proposals in this area throughout the 6th Framework Programme.

A **coordination action** - EXYSTENCE- was set up to organise workshops, to host theme institutes where scientists can meet and work for extended periods, to establish a clearly defined research focus (a 'road map') and to bridge the gap to industry and policymaking. The web-site, www.complexityscience.org, is a discussion and information forum for the complex system community and a central switch board for all funding activities (already active for about 3 years).

- BISON ** (Biology-Inspired techniques for Self-Organization in dynamic Networks)

- COSIN ** (Coevolution and Self-Organization In dynamical Networks)

- ISCOM ** (The Information Society as a Complex System)

- LEURRE ** (Artificial Life Control in Mixed-Societies)

- NEW TIES - [Project homepage](#) * (New and Emergent World Models Through Individual, Evolutionary, and Social Learning)

- POETIC ** (Reconfigurable Poetic Tissue)

- SOCIAL ** (Self Organised Societies of connectionist Intelligent Agents capable of Learning)

- SWARM-BOTS ** (Swarms of self-assembling artefacts)

Common to all these projects is the willingness to put the complex system approach into action in clearly defined research goals related to IST priorities.)

- Agent-based simulation to link micro to macro-phenomena in economics
- Economic policy/regulation design

Eurace

- Collaborative dynamics in online social communities
- Collaborative knowledge systems

TAGora

**Online
Communities**

Economics

- Cellular automata for multi-scale simulation
- Simulation of blood flow to study heart diseases

Coast

**Multi scale simulation
of emergence
in**

Emil

- Modeling Emergence of norms in e-societies
- Regulating e-communities

Bio

Informatics

Robotics

Gennetec

- Tools for simulating complex networks
- Modeling of gene expression networks as distributed systems

Perplexus

- Evolvable self-organizing HW devices
- Novel HW platform for simulation and in robotics application



Information Society Technologies



ISTweb Quick Links

ADVANCED SEARCH

[About IST](#) | [Work Programme](#) | [Calls](#) | [Site Map](#) | [Tools](#)

FET Open

(see Ralph Dum PowerPoint Presentation)

Submission any time – two stage process

There is no deadline and proposals can be submitted at any time (5 pages describing that 'what' and 'why': what applicants want to do and why it is visionary).

FET Pro-active

(see Jose Fernandez-Villacanas PPT Presentation)

Calls made ...



Information Society Technologies

Information Society Technologies



ISTweb Quick Links

Search ISTweb

ADVANCED SEARCH

FET: Future and Emerging Technologies

FET Home

Areas & Projects

Open Consultation

Towards FP7

Ongoing Consultations

Browse all ideas

Events

Open Calls

Documents & Links



Contacts

FET in the media

Proposal for a New Research Area *(launched on 26 Mar 2007)*

Title: Science of complex systems for socially intelligent ICT - Future FET Proactive Initiative

Research Objectives and Challenges:

o Key concepts and tools for a data-intensive science of large scale techno-social systems, i.e. systems in which ICT is tightly entangled with human, social and business structures which, as a result, mutually transform each other for instance through evolution of acceptance, trust, innovative uses and technology changes;

o Development of systematic means to gain knowledge on such systems and to model, predict and characterise their behaviour, their dynamics and evolution; o Demonstration of the use of this understanding in novel paradigms and designs for socially intelligent ICT.

The research should focus on the following topics:

o Theoretical and algorithmic foundations for scaleable modelling and simulation of such multi-level systems, taking into account the relevant technological, psychological and social dimensions and with realistic diversity of behaviours, social and spatial structures and knowledge on how humans and technologies relate to and impact on each other (e.g. acceptance, use, trust).

o Data-driven simulation, tools and techniques able to cope with huge sets of heterogeneous and often unreliable data to efficiently reconstruct dynamic system models at multiple levels. This includes data-rich probing technologies, protocols and experiments to gain realistic data on techno-social systems, and knowledge extraction based on scaleable and distributed methods.

o Prediction and predictability: mathematical and computational methods that help to characterize the nature and impact of transitions, novel properties and self-organising effects that can occur as systems massively scale up. Understanding the limits of predictability will allow reliable, quantitatively accurate predictions leading to strategies for better guided ICT induced transformation or for keeping systems in their viability domain.



FET – Proactive Future and Emerging Technologies

Science of Complex Systems for Socially Intelligent ICT



F1: FET – Proactive
jose.fernandez-villacanas@ec.europa.eu





Information Society Technologies



Information Society Technologies

ISTweb Quick Links

Search ISTweb

ADVANCED SEARCH

[About IST](#) | [Work Programme](#) | [Calls](#) | [Publications](#) | [FAQ](#) | [Site Map](#) | [Tools](#)

Future and Emerging Technologies

FET Home

Areas & Projects

Open Consultation

Towards FP7

Ongoing Consultations

Browse all ideas

Events

Open Calls

Documents & Links



Contacts

FET in the media

Proposal for a New Research Area *(launched on 26 Mar 2007)*

Title: Science of complex systems for socially intelligent ICT - Future FET Proactive Initiative

Research Objectives and Challenges:

o Key concepts and tools for a data-intensive science of large scale techno-social systems, i.e. systems in which ICT is tightly entangled with human, social and business structures which, as a result, mutually transform each other for instance through evolution of acceptance, trust, innovative uses and technology changes;

o Development of systematic means to gain knowledge on such systems and to model, predict and characterise their behaviour, their dynamics and evolution; o Demonstration of the use of this understanding in novel paradigms and designs for socially intelligent ICT.

The research should focus on the following topics:

o Theoretical and algorithmic foundations for scaleable modelling and simulation of such multi-level systems, taking into account the relevant technological, psychological and social dimensions and with realistic diversity of behaviours, social and spatial structures and knowledge on how humans and technologies relate to and impact on each other (e.g. acceptance, use, trust).

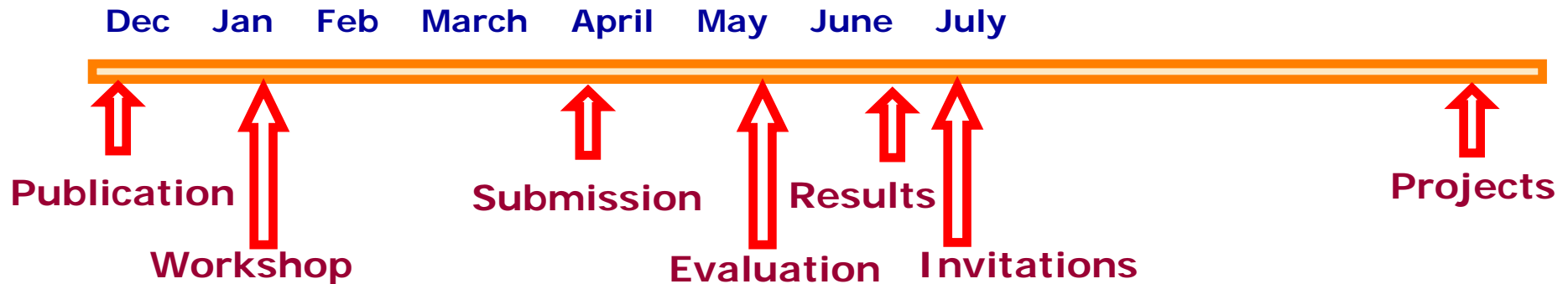
o Data-driven simulation, tools and techniques able to cope with huge sets of heterogeneous and often unreliable data to efficiently reconstruct dynamic system models at multiple levels. This includes data-rich probing technologies, protocols and experiments to gain realistic data on techno-social systems, and knowledge extraction based on scaleable and distributed methods.

o Prediction and predictability: mathematical and computational methods that help to characterize the nature and impact of transitions, novel properties and self-organising effects that can occur as systems massively scale up. Understanding the limits of predictability will allow reliable, quantitatively accurate predictions leading to strategies for better guided ICT induced transformation or for keeping systems in their viability domain.



Science of Complex Systems for Socially Intelligent ICT

Call details (tbc)



Info Days

Thematic workshops:

input to future WPs and impact assessment

- Small IPs and 1 CA
- 20 million Euros (1 million for CA)

ONCE-CS

**SIXTH FRAMEWORK PROGRAMME
PRIORITY 2**

**Information Society Technology – Future and Emergent
Technologies**



COORDINATION ACTION

CORDIS / ISTweb / Directorate F / FET / Suggest an idea Important Legal Notice



Information Society Technologies



CORDIS

ISTweb Quick Links ▼ Go

ADVANCED SEARCH

[About IST](#) | [Work Programme](#) | [Calls](#) | [Site Map](#) | [Tools](#)

ONCE-CS

Open Network of Centres of Excellence in Complex Systems

+ European Conference on Complex Systems

+ Complex Systems Society Portal

+ Thematic Schools

+ Education

+ Enlarging Community

+ Widening participation in Europe & the World



TECHNISCHE
UNIVERSITÄT
DRESDEN

ECCS'07

EUROPEAN
CONFERENCE
ON COMPLEX SYSTEMS

Dresden, October 1-5, 2007



Background picture by Vishwani Prasad, New York University, NY, USA, taken during the conference dinner

Supported by:



ONCE-CS



NEST



Program Committee Chair:

Jürgen Jost

(MPI for Mathematics in the Sciences, Leipzig,
Germany)





Information Society Technologies



ISTweb Quick Links

ADVANCED SEARCH

[About IST](#) | [Work Programme](#) | [Calls](#) | [Site Map](#) | [Tools](#)

Can science inform policy?

Brussels. December 2006

Policy Informatics in an Interdependent World.

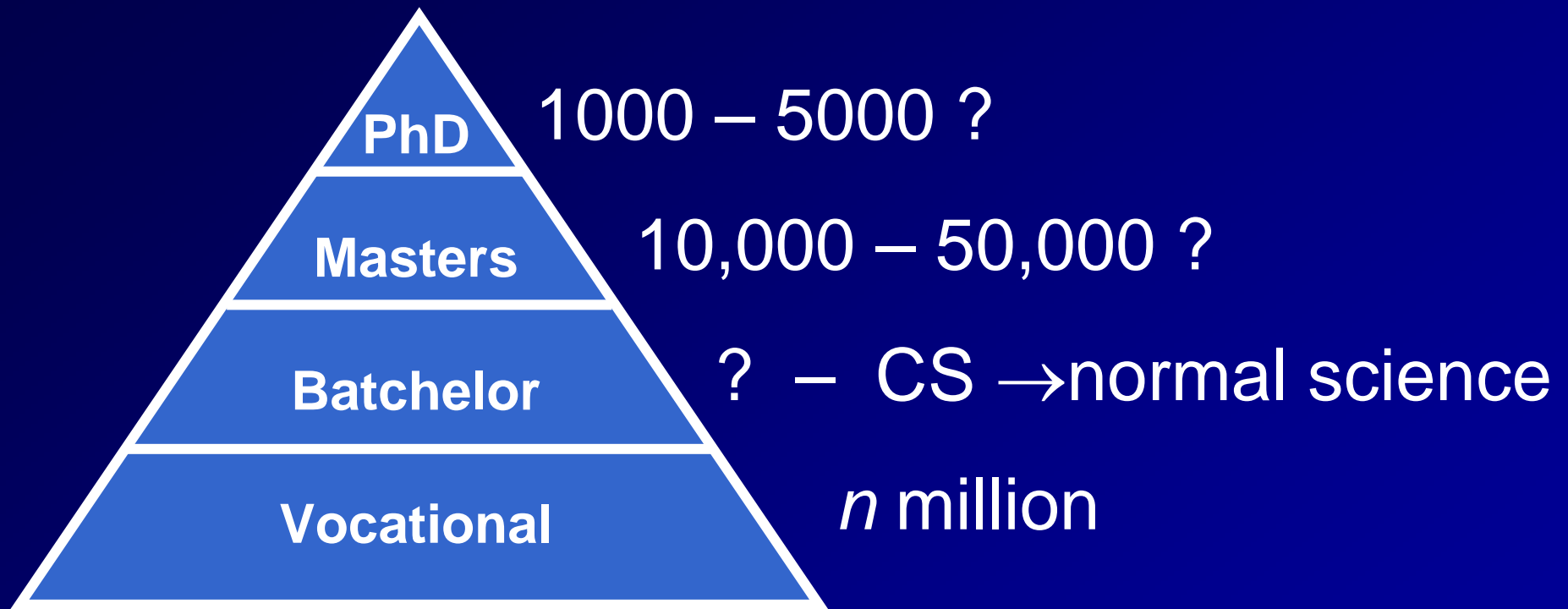
Washington. September 2007

Science & Politics : In the Face of the Looming Disaster

A Colloquium organized by the Collegium International and Complex Systems Society ISC PIF, Paris, 28-29 Sept 2007

Meeting in London - Spring 2008

CS Education Needs in Europe to 2011



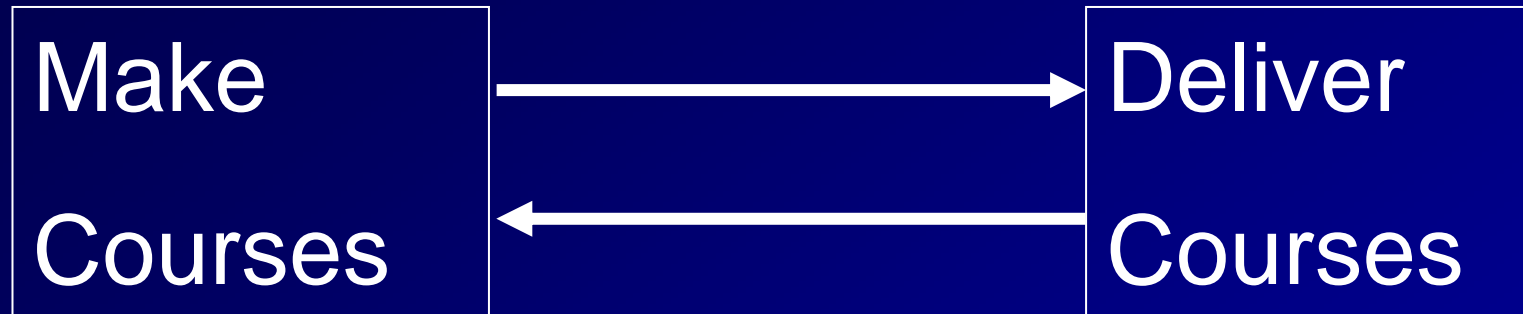
ONCE-CS Roadmap for Complex Systems

CS will be embedded in Policy new IT systems

We need a *lot of people* trained in CS science *very quickly*

Europe – America – Asia – Africa

Enhanced *t*echn*O*logy for *i*ntelligent *l*earning *e*nvironments



Learning Objects

'Treasure' & robots

intelligent tagging

Semi-auto markup

Course ecology

personalised:

study advice & records

assessment & exams

semi-automatic marking

CSS accreditation

Enhanced *te*chnology for *i*ntelligent *l*earning *e*nvironments

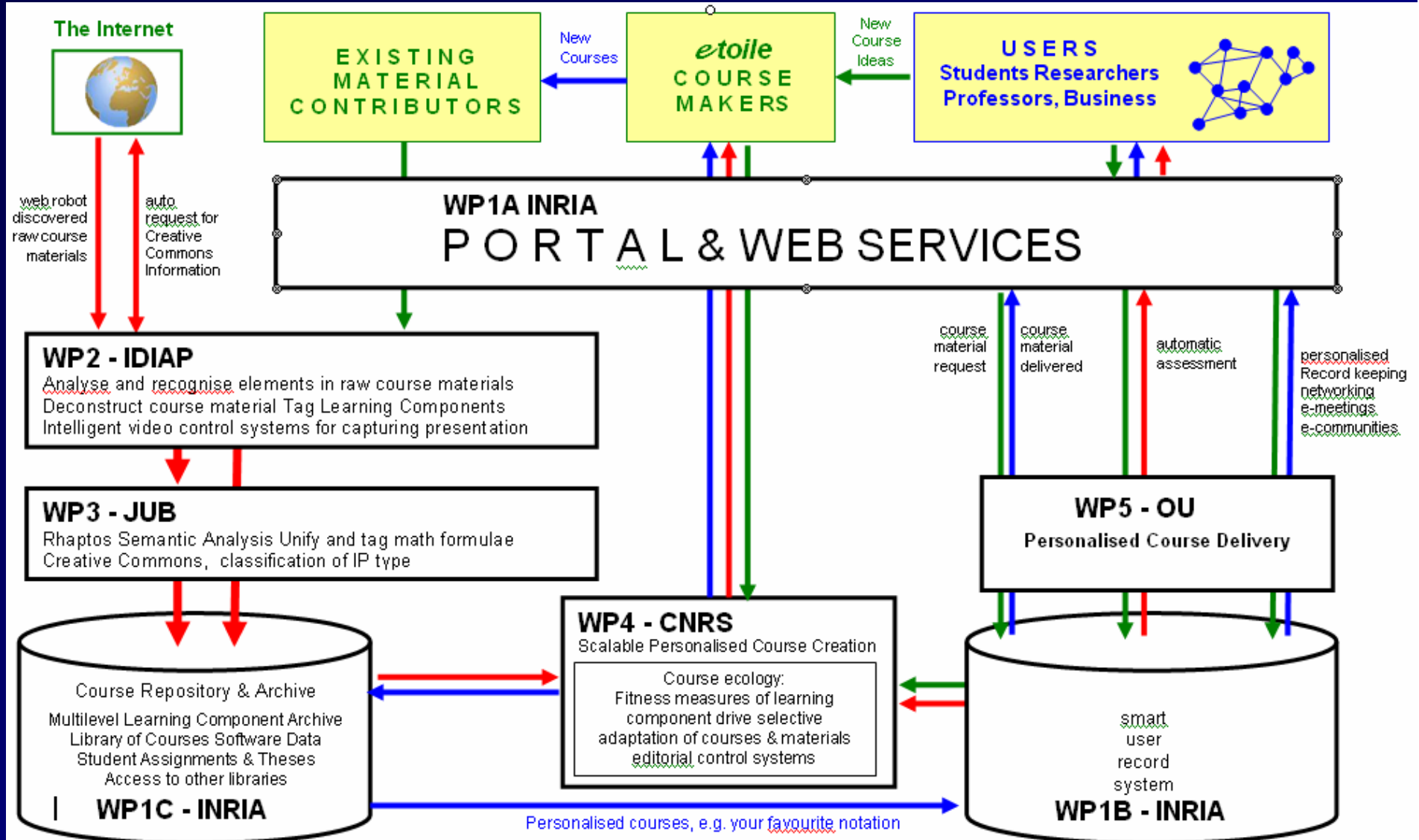


Figure 3. IOUCS Course Production, Delivery and User Support System

- User-generated information
- Automatically generated information
- Courses and course material

Core Curriculum for Masters & PhDs

Design Economics Biology-Medicine City Planning

Climate

Mathematics
Statistics
Computation
Physics
...

Conflict

Policy

Robotics

Management

Agriculture

Ecology

Earthquakes



Fullscreen

user: pass: login

-> Register | I forgot my pass | I forgot my login

Content

HOME

▼ ABOUT

About Complex Systems

About CSS

CSS Statutes

CSS Committees

Contact

▼ EVENTS

News

Calendar

ECSS Conferences

▼ RESOURCES

Education

Roadmap

CS Projects

► E-archives

▼ COMMUNITY

Coffee Corner

Who is who

Institutions

Jobs

► TOOLS

menu

JOIN US

Home Page

Start Page

English

Complex Systems Society

[Change language for other versions](#)

The purpose of the Society is to promote the development of all aspects of complex systems science in the countries of Europe, in relation with the whole international scientific community

The Society will, in the European context, aim to promote complex systems research (pure and applied), assist and advise on problems of complex systems education, concern itself with the broader relations of complex systems to society, foster the interaction between complex systems scientists of different countries, establish a sense of identity amongst European complexity scientists, and represent the European complexity community at all international levels.

SUBSCRIBE CSS NEWSLETTER

The ECSS Society was successfully launched 7th Dec 2004 during The European Conference on Complex Systems at Foundation ISI in Torino, Italy, 5 - 7th December 2004. It became CSS in 2006 during the ECSS06 Conference in Oxford. For further information follow the links on the left.

The EC is currently funding two new Coordination Actions to support complex systems science.

HOT TOPICS

CSS COUNCIL ELECTION : CALL FOR CANDIDATURE

- CSS Newsletter July 2007
- **The next conference ECSS 07 will take place in Dresden, Oct 1-5 2007.**
- New Complex systems archives **NEW**
- **JOIN THE SOCIETY NOW!**
- **ECSS'09: Call for proposals** **NEW**
- Roadmap Committee: First version of the Complex Systems Sciences map **NEW**





Username: Password: login
Register | Not my pass | I forgot my login

- Content
- HOME
- ▼ ABOUT
 - About Complex Systems
 - About CSS
 - CSS Statutes
 - CSS Committees
 - Contact
- ▼ EVENTS
 - News
 - Calendar
 - ECSS Conferences
- ▼ RESOURCES
 - Education
 - Roadmap
 - CS Projects
 - E-archives
- ▼ COMMUNITY
 - Coffee Corner
 - Who is who
 - Institutions
 - Jobs
- ▼ TOOLS

Standards for tools etc ?

Springer Textbook

etc Join & Join In !

Complex Systems Society

The purpose of the Society is to promote the development of all aspects of complex systems science in the countries of Europe, in relation with the whole international scientific community.

The Society's main objective is to promote the development of complex systems science in the countries of Europe, in relation with the whole international scientific community. The Society's main objective is to promote the development of complex systems science in the countries of Europe, in relation with the whole international scientific community.

SUBSCRIBE CSS NEWSLETTER

The ECSS Society was established in 2006 during the European Conference on Complex Systems at Fondazione ISI in Torino, Italy. The 7th December 2004, it became CSS in 2006 during the ECSS06 Conference in Oxford. For further information follow the links on the left.

The EC is currently funding two new Coordination Actions to support complex systems science.

Change language for other versions

CSS COUNCIL ELECTION : CALL FOR CANDIDATURE

- CSS Newsletter July 2007
- The next conference ECSS 07 will take place in Dresden, Oct 5-10, 2007.
- new Complex systems archives **NEW**
- JOIN THE SOCIETY NOW!
- ECSS'09: Call for proposals **NEW**
- Roadmap Committee: First version of the Complex Systems Sciences map **NEW**



JOIN US



user: pass: login
-> Register | I forgot my password | I forgot my login

- Content
- HOME
- ▼ ABOUT
 - About Complex Systems
 - About CSS
 - CSS Statutes
 - CSS Committees
 - Contact
- ▼ EVENTS
 - News
 - Calendar
 - ECCS Confer
- ▼ RESOURCES
 - Education
 - Roadmap
 - CS Proj
 - E-archives
- ▼ COMMUNITY
 - Coffee Corner
 - Who is who
 - Institutions
 - Jobs
- ▼ TOOLS

HomePage
Start Page

The purpose of the Society is to promote the development of research in complex systems science in the countries of Europe in relation with the whole international scientific community.

In the European context, aim to promote complex systems science (basic and applied), assist and advise on problems of complex systems education, concern itself with the broader relations of complex systems to society, foster the interaction between complex systems scientists of different countries, establish a high quality European complexity scientists' network, establish a European complexity community and international links.

SUBSCRIBE CSS NEWSLETTER

The ECSS Society was successfully launched 7th Dec 2004 during The European Conference on Complex Systems at Foundation ISI in Torino, Italy, 5 - 7th December 2004. It became CSS in 2006 during the ECCS06 Conference in Oxford. For further information follow the links on the left.

The EC is currently funding two new Coordination Actions to support complex systems science.

Engage with Policy
Engage with industry
Engage with society

Change language for other versions

**CSS COUNCIL ELECTION :
CALL FOR CANDIDATURE**

- CSS Newsletter July 2007
- **The next conference ECCS 07 will take place in Dresden, Oct 1-5 2007.**
- New Complex systems archives **NEW**
- **JOIN THE SOCIETY NOW!**
- **ECCS'09: Call for proposals** **NEW**
- **Roadmap Committee: First version of the Complex Systems Sciences map** **NEW**



Stories from UK

EPSRC – complex systems programme

EPSRC – Taught schools

EPSRC – Doctoral Training

**EPSRC – AHRC ‘Designing for the 21st Century
(Embracing Complexity in Design)’**

**Interdisciplinary groups: Oxford, LSE, Lancaster,
Southampton, Cranfield, Bristol, Bath, Liverpool, Salford,
Open, Warwick, ...**

Stories from UK

EPSRC – complex systems programme

EPSRC – Taught schools

EPSRC – Doctoral Training

EPSRC – AHRC ‘Designing for the 21st Century
(Embracing Complexity in Design)

Interdisciplinary groups: Oxford, LSE, Lancaster,
Southampton, Cranfield, Bristol, Bath, Liverpool, Salford,
Open, Warwick, ...

+ Many Stories from Europe (e.g. OUCS)

Conclusions

FP7 Large research programme

A lot going on in Europe

Opportunities for collaboration