

# Update from Scientific Co-ordinators

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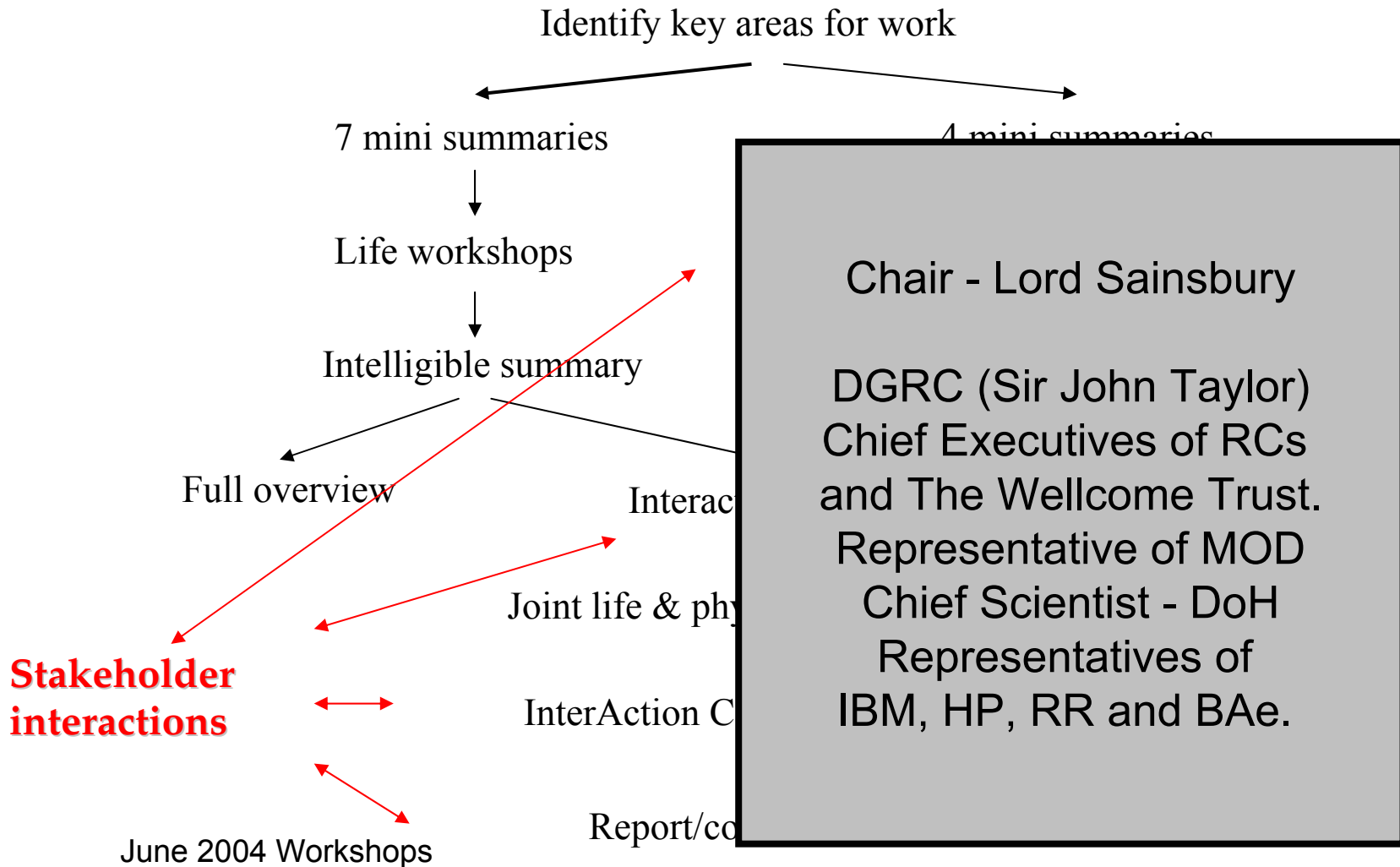
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# Cognitive Systems

## A working definition

“Cognitive systems are **natural** or **artificial** information processing systems, including those responsible for perception, learning, reasoning, and decision-making, and both communication and action”.

# The Project Process



# Mini-summaries/Research reviews

## Physical Sciences

Sensory Processing  
Memory, Reasoning & Learning  
Interaction, Planning & Motivation  
Large-scale, small-scale systems

## Life Sciences

Self-Organisation in the Nervous System  
Representation  
Speech and Language  
Action  
Social Cognition  
Learning and Memory  
Advanced Neuroscience Technologies

# State-of-the-art Reviews

(to be published as a book)

How to design a  
cognitive system

Self-Organisation in the Nervous System  
Large-scale, small-scale systems

Cognitive systems in  
touch with the world

Representation  
Speech and Language  
Sensory Processing

Cognitive systems  
in action

Action  
Social Cognition  
Interaction, Planning & Motivation

Memory

Learning and Memory  
Memory, Reasoning & Learning

# Physical & Life Sciences Workshops (2003)

- Conclusively demonstrated that the domain of overlap between the two communities is not an empty set
- Established (or reinforced) links between experts working on similar topics in the two communities – e.g. speech (or vision)
- Helped to turn the areas of common interest into “Grand Challenges”

# Conclusions Outcomes

- The Foresight Project has engendered an ethos of closer collaboration between physical scientists and life scientists
- The involvement of learned societies in the follow-up has been universally welcomed
- Both communities are keen to move from discussion to action – a key metric will be the number of major interdisciplinary proposals funded as a result of the Workshops being organised in 2004

# Activities since IAC

- Presentations to Research Councils and Wellcome Trust
- Planning and organisation of 2004 Workshops
- VC events (Library House)
  - Initial meeting in November 2003
  - Vision (April 2004)
  - Healthcare (May 2004)



# Presentation to funding bodies

- MRC Neuroscience Board (November 2003)
- EPSRC Council (December 2003)
- Academic Appraisal Committee of Wellcome Trust (May 2004)
- BBSRC (July 2004)

# Presentation to MRC

## Summary of key points

- The project was praised for providing valuable insight into areas where exchange will be of greatest value. The project's recommendations of closer co-operation were timely. There had been interchange before, but the project had confirmed that *now was the time to make a specific push to facilitate greater interchange between these two communities.*
- The Board considered the project should lead to greater funds to support research at this interface.

# Presentation to MRC (cont'd)

## Key areas supported by Board

- cross-disciplinary training to increase skills base, best if student-driven
- cross-disciplinary training should not be restricted within a single HEI
- Networks/workshops will provide a good source from which cross-disciplinary projects can grow
- maths fundamental, need more of this as a basic subject
- funding should be considered under SR2004, also should see how to influence spend under SR2002
- need for more debate on social and economic issues raised by cognitive systems

## Presentation to EPSRC

- Professor John O'Reilly (Chief Executive of EPSRC):

***“EPSRC would greatly welcome further research in this area. We have already set up a Life Sciences Interchange grants programme, and Doctoral Training Centres including one in neuroinformatics. Nothing would please me more than to see specific projects funded. I look forward to seeing the applications....”***

# Cognitive Systems Workshops

- Five workshops are taking place during the first half of 2004:
  - Knowledge, Memory and Learning (G. Hitch & R. Logie) - *York, 2<sup>nd</sup> April*
  - Self-organisation (D. Willshaw) – *Edinburgh, 24<sup>th</sup> and 25<sup>th</sup> May*
  - Vision (A. Fitzgibbon & A. Parker) – *Oxford, 16<sup>th</sup> June*
  - Speech & language (W. Marslen-Wilson & S. Young) – *Cambridge, 28<sup>th</sup> and 29<sup>th</sup> June*
  - [Robotics]

# Workshop 1 (Knowledge, Memory and Learning)

## Aims

- To identify programmes of research focused on seeking **biologically-inspired solutions to problems in building artificial memory systems**, while using the insights gained to feed back into our understanding of living memory systems
- A response from the Life Sciences community to the “Memories for Life” Grand Challenge from the UKCRC

## Workshop 2 – Self-organisation

“The main aim of the Workshop was to explore how far, within both physical and life sciences, knowledge of the principles of self-organisation within one area can inform and be informed by knowledge in another area”

# Workshop 4 - Speech and language

- Topics to be discussed:
  - Brain imaging technology
  - Applied psychology and neuroscience
  - Machine learning
  - Language processing technology



# Beyond the workshops...

- The aim of these four Workshops is to generate high-quality research proposals written jointly by physical scientists and neuroscientists
- These proposals will be assessed by a *community of referees* – scientists who have attended at least one of the meetings organised by the Foresight Project and are therefore familiar with its aims

# Cognitive Systems Funding (1)

- Joint initiative between Wellcome Trust and four Research Councils (EPSRC, MRC, BBSRC & ESRC)
- Multi-disciplinary proposals expected from end of summer onwards (but no specific Call)
- Proposals should be submitted to Research Council of “Lead” Investigator
- The assessment procedure will be the same for all proposals (Programme Managers from different Research Councils + Wellcome working together)

## Cognitive Systems Funding (2)

- Proposals should mention Cognitive Systems Foresight Project and could refer to one of the “themes” explored during the Project
- Applicants should aim for a 3-year research programme but also place this within a longer-term agenda or “manifesto”
- Quality of proposals submitted under Cognitive Systems “banner” will be reviewed in summer 2005