Web *0? Combining peer production and peer-to-peer systems

Personal view of work in the scope of the call
Objective IST-2007.8.4 FET proactive

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Self-* + Web2.0 = Web *.0 ?

- Current Web2.0 apps. enable and channel user behaviour for “peer production”. Also leverage social networks
- But highly centralised = expensive, difficult to administer, single points of failure and security / privacy + control
- Current P2P apps. provide limited user interaction but operate via distributed self-organised cooperative networks between nodes (so-called self-* systems)
Self-* + Web2.0 = Web * .0 ?

• If the two approaches can be combined = distributed, self-organised peer production systems with no central control, administration, set-up or running costs
• In fact, ultimately, if new code itself could be propagated through such networks they could transform themselves into any kind of social application over time (compare facebook apps)
• A techno-social operating system? Web * .0 ?
Two open issues

• But to achieve this we need to tackle two serious open issues in distributed ICT design
  – The “rationality gap”
  – The “power gap”

• These issues require careful theoretical and empirical work to address
The Rationality Gap

• Distributed systems designers often assume users and components:
  – Behave altruistically
  – Behave in an economically rational way
• But open systems can’t assume altruism: we don’t live in “hippie world”
• Rational action theory relies on assumptions that don’t hold either
The Rationality Gap

Gap in the middle

Bounded Rationality
learning / adaptation

Altruistic  Rational

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The Power Gap

• Distributed systems designers often assume users and components are:
  – Centrally administered or controlled
  – Are completely independent and autonomous

• But central control is not possible in massive open systems

• Complete autonomy is rare because components are interdependent
The Power Gap

Gap in the middle

Complex and changing social structures

Central Control

Complete Autonomy
Complexity Science to the Rescue!

• It is precisely in these gaps that complex systems are found
  – Bounded rational and adaptive behaviours
  – Complex evolving networks
  – Emergent structures and learning models

• Results and approaches from complex systems science can be applied
User Rationality

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What to do?

• Bring together leading EU:
  – Distributed systems designers (in the gap)
  – Social / complex systems modellers
• Produce plausible (predictive?) models of both user rationalities, distributed ICT protocols and social structures
• Apply them to open problem domains in self-organising ICT
• Analyse empirical results and revise models
Outputs

• Tools and models for developing next-generation socially intelligent ICT
• Socially intelligent design patterns
• Prototype systems / simulations
• Empirical evaluations from prototype systems => need a large initial user based to achieve this
Areas, methods, applications

- Self-org ICT (P2P)
- Complex systems models
- Social science

designs, prototypes and tools

- Prototype applications
- Empirical analysis
- Theory revision

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