

Agent Based Modelling of Software Organisations

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Background Motivation:

- Agent Based Social Simulation (ABSS), (see Journal of Artificial Societies - JASSS)
- Cultural Evolution – Memetics (see Journal of Memetics - JOM)
- Social / Cultural nature of “work practices”
- Applicable to Software Organisations?
- Information Artifacts - memes? (Green / Perry)
- Informal social networks (Chris Douce)

Motivation

Currently working on FIRMA (FP5) project

- ESRC fellowship – Negotiation
- ABSS models need to be informed by specific and contextualised empirical work
- Seems work within PPIG can help in this?
- Possible collaboration leading to grant application(s)?
- Produce a bench-top experimental lab – SimCity

So what's an ABSS?

- Multiple interacting agents
- Various possible levels of “intelligence”
- Adaptation, Beliefs, Intentions, Goals
- Other techniques...
- Emergent properties – phenomena
- Levels of abstraction (artificial societies / artificial life)

ABSS / Organisational Culture

- Organisational structures / compared (Carley et al - CMU)
- Organisational “culture” *THE* major factor in understanding / improving software organisational performance (Curtis 1998)
- How to model organisational culture within a software organisation (?? Informational artifacts – a way in? Perry 1998) – Chancey et al 1998 (Brahms – but not dynamic, no learning)
- Distributed Cognition – Hutchins 1995 – emergent cognition?

Constructing and ABSS Ontology – Needed

- Francoise Detienne – applicable:
- Viewpoints (confrontation)
- Roles
- Protocols
- All above can adapt too (how ambitions?)
- Time and Space issues

Considering Models

- Psychological models
- Comprehension and cognitive models
- Cognitive psychology: evaluation and testing of ‘reasoning’ models
- Consideration: modelling software cognition?
- Social aspects of software development?

KISS – Abstraction – Informational Artifacts

- Agents have skills and goals and viewpoints
- Tasks require synchronised combinations of time, skills and informational artifacts
- The combination and distribution of IA's can characterise the “culture” (formal and informal) of an organisation(?)
- The dynamics and interactions of artifacts (through agent minds) captures organisational practice and adaptation(?)
- “Computational Memetics” (?) – very abstract – often follow a biological tradition... can we use these ideas to begin the modelling enterprise.

Two extreme forms of organization

- Open Source Community – bottom up, synch comms, web-based IA's – publicly viewable
- Classical hierarchy – top down, management layers, sync-face-to-face. Formals meetings, internal docs and source code.
- Can we decontextualise tasks?

Further References:

- Snorkel, A. (1989) A modern approach for the evaluation of distributed engineering problems. International Journal of Marine Software Systems. Vol. 9, p. 121-136.