What have we achieved?

MABS 2000

2nd International Workshop on Multi Agent Based Simulation
My issues for MABS-2000

• Problem-oriented approach
  – Techniques chosen or developed for aim of software system (e.g. social simulation model)

• Agent interaction in scalable, complex software systems

• Validation of representational models and applications

• Role of foundational ABSS
Your issues for MABS-2000: prediction

• Prediction validates simulation models as descriptions of social systems
• Predicting properties of systems with changing structures
• Expectancy of conditions that will (might?) emerge in real world
Validation

• Require validation methodology

• Complexity of agent specification
  – Complex agents identified with basis of agent design in cognitive science

• Complexity of agent design trades off explanation for prediction
Reported validation procedures

• Validation by appeal to domain experts and/or qualitative descriptions of observation
  – Retirement model (Rob Axtell)?
  – Archisim (presented by Alexis Drogoul)
  – Climate change models (Claudia Pahl-Worstl)
  – Shipping (Klaus Fischer)
  – Inter-sexual dominance (Charlotte Hemelrijk)
  – Common resource use (Olivier Barreteau)

• Validation by prediction
  – None in conventional sense of (eg) Popper
Problem-solving

• Small models to solve particular problems
  – Cognitive science vs engineering
  – “Any purposive behaviour modellable as utility formulation” – Axtell

• Impact of sociological models on technical systems

• Organizational analysis
  – New forms crossing computer-human boundaries

• Feedback to social scientists
Macro-micro issues

• Different perspectives rather than different simulation systems
  – Drogoul, Fischer, Barreteau, Pahl-Worstl

• Need model systems – different grain but mutually consistent
Discussion of micro-macro issues

• Universality: given macro system properties sometimes follow from a range of alternative agent specifications.
  – Axtell: Makes agent specifications less important
  – Drogoul: Axtell view (representing SFI) incompatible with participatory modelling approaches

• When and why universality occurs is an important research issues
Foundational issues

• Formalisms & derivatives
  – Norling: extending BDI as programming paradigm
  – Teran: transforming agent models to constraint logic – facilitating theorem proving of MAS properties
  – David: extending use of logical formalisms to clarify core concepts and issues without loss of expressiveness

• Promise of link to representational simulations
  – Scale problem?
Lessons or results from papers

• Validation – which papers validated models
  – In practice, papers with validation entailed validation by description

• Feedback to social scientists?

• Impact of cognitive science?

• Contributions to software design/engineering
  – From use of or appeal to logical formalisms?
  – By analogy from social models?
Final issues raised in discussion

- What kinds of systems are best approached using a MAS paradigm?
- Within MASs, what should be the most fine grained level of agent?
- How is the grain of the system to me justified?