

Agreement Technologies

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with thanks to

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AAMAS '08, Estoril

May 15, 2008

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- There is a need for developing models, frameworks, methods and algorithms for constructing large-scale open distributed computer systems where *autonomy*, *interaction* and *mobility* are the key characteristics.
- Agent-oriented software engineering has made (and is doing) so far significant contributions but...we still believe that there is something missing.
- Agent programming languages must go beyond the current state of the art, so far focused on the notions of agent architecture and protocol. Even beyond the ideas represented by WADE, which attempts at bringing the notion of process into agent development.

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- Agents are uninteresting unless they are: a) owned and controlled by different individuals; b) share some kind of "normative" environment (where normative could actually also be physical).
- We envisage a new programming paradigm that is based on two concepts:
 - (1) a *normative context* or *agreement environment*, that determines the rules of the game, i.e. how the interactions between agents are going to happen
 - (2) a *call-by agreement interaction method* that is based on a two step process: first the establishment of an agreement for action between the agents that respects the normative context, and second, the actual program call for the enactment of the action.
- Programmers must be allowed to create agreement environments, their access rules, their composition.
- The programming paradigm must allow the dynamic establishment of agreements, the verification of the fulfilment of agreements, and the management of agents that fail to honour their commitments even when agreements are signed.
- Furthermore, if we can never again look inside the code of all the systems involved in a cross-organisational business application, we need models of what systems could do (models of action) and what they promise to do (agreements).

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- We envision that future methodologies, programming languages and tools for MAS-oriented development must grow around three fundamental notions: agreement environment, agreement, and agent.
- Agents are situated in some agreement environment that constrains the dynamic enactment and fulfilment of agreements as reached by agents.
- From a programmer's point of view we shall need to specify and enact environments, to specify and enact agents, and a machinery to process agreements as agents interact.
- Notice that this approach is not far from the way we humans daily operate. Thus, we daily enact contracts in the framework of some regulatory body that shape our future interactions.

Thank you!

