# Dynamic Agent Coalitions for Mediating E-Commerce B2B Activities

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Diversity of processes one may observe in today's E-Commerce B2B world may be characterised by the intrinsic features of distribution, and uncertainty. Distribution means that a process is performed by independent executives. They act relatively autonomously by taking their decisions and facing the consequences on their own. These actors differ from each other by their capabilities to perform certain actions, by the limitations on their resources, by their states and corresponding state constraints, by beliefs about the outer environment as well as by their personal intentions, goals and priorities. The point is that the players are committed to collaboration in order to do the work in the most optimal way, though these coalitions are pretty uncertain. Uncertainty also has many dimensions. The actors are not subjectively certain about the commitments, to say more generally about the possible behaviour of another actors. Uncertain are also the subjective readiness to collaborative work, the subjective estimation of predictability and credibility one executive has about the other(s). The flow of the process is also highly uncertain. The actors take their subjective decisions on how, when and whom to collaborate with either by forming more or less stable coalitions based on collective commitments and regulated by team conventions, or by choosing the optimal bid by a kind of trade-off or negotiation each time they need a partner.

The Agents research group at Zaporozhye State University, Ukraine is currently developing the formal approach and the agent-based modelling framework to cope with the variety of applications dealing with these features of distribution and uncertainty in dynamics.

The talk will be focused on how the advantages of the approach may be applicable to the mediation scenarios in E-Commerce B2B domain.

The presentation will report on the research in progress and will cover the following topics:

- **Motivating Application** – E-Commerce B2B: simulative scenario for Mediation in Capital Investment Consulting
  It is assumed that ABC is a successful company at Capital Investment Consulting Market. From one side, perspective investors are looking for the placements of their capitals in Industrial or Housing Construction. From the other hand, the companies and authorities involved in construction, supply chain, labour resources monitoring are bidding for joining consortia together with the investors. ABC holds its electronic marketplace for mediating these activities by providing grounded Investment Plans and Consortia Compositions. The methodology is planning by evaluation.
- **The approach** to model dynamic organisations **in a Nutshell** – distributed character and interoperability, generic character and scalability, adaptability and intelligent behaviour
- **Generic Agent-Based Framework models** are described in details: Agent Model, Communication Model, Functional System/Component Model, Task Coalition and Task Execution Model, Evolution Model. As the problem of co-ordination is one of the most important for the staff and for the applications, Co-ordination types and models are presented in more details after the case study discussion
- **Case studied and lessons learned**: A modelling case on planning Software development project by evaluation within the artificial organisation (IS department) is briefly discussed.
  IS department comprises Project Manager, Programmer, DBA, Tester, Documentation Design, User Liaison agents. The results obtained and the lessons learned from the study are presented.
- **Co-ordination as the core problem**: The role of co-ordination is stressed in the Case Study presentation part. Co-ordination types, respective models are discussed here. Proposed are 3 types of co-ordination activities: 1) Negotiation on placing the work and joining the coalition. 2) Facilitating to parametric feedbacks and synchronising work sequences. 3) Monitoring actors' activities within the coalition.
- The possible **relevancy** of the reported approach to **Semantic Web** and European **Dynamic Value Constellation** domains is outlined as well as some **unsolved problems** and the plans for future work are presented to summarise the talk and to initiate the discussion