Multi-Agents Systems (MAS) between Hierarchy and Market:
Organizational Issues to Determine Scope and Status of MAS-Applications

Hans Czap

Business Information Systems, Univ. of Trier,
D 54286 Trier, Germany
cz@wiinfo.uni-trier.de
http://www.wi.uni-trier.de

Abstract. The presentation starts with well known examples of MAS-applications, like homebots in order to balance load of power delivery, the concept of SoComs (Sphere of Commitments) to handle contract obligations in a flexible way, multi-agent systems for production control and for supporting supply chain management (SCM), mobile information agents, and policy agents for scheduling in hospitals.
These examples are analyzed with respect to common values of the organizational variables *'goal orientation'*, *'coordination'* resp. *'co-operation'*, *'division of labor and allocation of work'*, and '*delegation and responsibility'*.
Particularly, depending on the situational variables *'information availability'*, '*environmental dynamics'* and '*problem-complexity'* these organizational variables show typical ranges. Thus, a common framework is established in order to classify multi-agent systems for their ability to solve business problems.

In recent decades *principal-agent-theory* has turned out to be one of the most prominent theoretical foundations of management science. Applying this theory to the application of MAS in enterprises, an improved and theoretically guided understanding of deficits of MAS applications will result. Combining these insights with the situational variables *'information availability'*, '*environmental dynamics'* and *'problem-complexity'* most promising research areas for future applications are identified.