

Projects

On this page an overview of projects using Jadex is given. The projects are divided in two broad categories: **industrial research projects** and **academic research projects**. In the first category all projects with some participation of companies are listed, whereas in the latter category projects with pure University participation are contained. Typically, projects with industry participation address real business needs and try to develop concrete solutions, while University projects highlight the gaining of scientific insights. If you are using Jadex in your project we would appreciate if you could add a description of your project at this page (the only requirement is that you register at the Wiki).

Industrial Research Projects

Go4Flex (since 2009)

The Go4Flex (Goal-orientation for Flexible business processes) project aims at supporting the agile definition and execution of workflows. The available modeling approaches for describing business processes emphasize the activities to be performed and their respective ordering. This view is limited and does not take into account other important facets of business processes, like objectives behind the process and the context it is executed in. This inflexibility and concreteness of business process specifications may lead to problems regarding process evolution and new process variants. Together with the industrial cooperation partner Daimler AG the Go4Flex project strives to develop new approaches for modelling and executing business processes, which will be applied practically within the car production and logistics application domain.

Project Partners

Go4Flex is a [DFG-funded](#) technology transfer project, which is carried out in close cooperation with the [Daimler AG](#).

Project Approach

In the project it will be analyzed how current workflow modeling languages can be enriched by agent-oriented concepts in order to enhance their expressiveness. It is especially intended to use BDI agent concepts to increase the abstractness of the descriptions. The achieved abstractness will help making process descriptions more agile and flexible in their use. This will allow process descriptions to evolve and process variants to emerge without having to change the underlying base processes. On the one hand the project builds on business process research of the Daimler AG, which laid the foundation for agile processes and their goal-oriented concepts. On the other hand the projects profits from the research in the area of BDI agents systems of the University of Hamburg.

Further Information

The project homepage can be found here [Go4Flex Homepage](#)

Academic Research Projects

In this section academic research projects are listed, which build on Jadex. Typical organizations supporting national research efforts in Germany are the [DFG \(Deutsche Forschungsgemeinschaft\)](#) and the [BMBF \(Bundesministerium für Bildung und Forschung\)](#). The Jadex project was originally initiated in the context of the DFG-funded [MedPAGE](#) project.

SodekoVS (since 2008)

The SodekoVS (Self-organization using decentralized coordination in distributed systems) has the main objective to introduce self-organization as one additional building block for software development. The advantages of self-organizing systems are an increased adaptability and robustness caused by the decentralized architecture of those systems. The main challenge is that the construction of self-organizing systems is intrinsically hard, because the self-organization emerges from the interactions of the individual parts of the systems and therefore cannot be described with traditional design techniques. Furthermore, self-organization has a quantitative dimension, which typically cannot be foreseen exactly and has to be configured using simulation experiments.

Project Partners

The SodekoVS research effort is a DFG-funded tandem project of the University of Hamburg and the Hamburg University of Applied Sciences (HAW).

Project Approach

In the project first existing self-organization mechanisms will be classified and described with respect to their essential characteristics. The descriptions will be in the form of software patterns, which define a clear set of criteria and therefore allow a precise definition of mechanisms and further help developers deciding whether a specific mechanism may be helpful for the concrete problem at hand. To facilitate the usage of the mechanisms also a self-organization middleware will be built on basis of a multi-agent layer. Main purpose of the middleware is the provision of the self-organization mechanisms for agents. Software developers can use these infrastructure components in combination with a guiding methodology for engineering self-organizing systems in a systematic way. For the validation of the proposed concepts it is also planned to evaluate the approach by developing a software prototype in cooperation with a logistics company.

Further Information

The project homepage can be found here: [SodekoVS Homepage](#) .

MedPAge (2000-2006)

MedPAge (Medical Path Agents) is a research project, focusing on **treatment scheduling for patients in hospitals**. Scheduling and coordinating patients in hospitals is faced with a high amount of complexity due to the inherent dynamics of the processes and the distributed organisational structure of hospitals. Multi-agent technology facilitates solutions to these problems, as the autonomy of agents allows to maintain the integrity of the existing organisational structure of hospitals. Furthermore, agents are able to react flexible to changes and disturbances (e.g. emergencies and complications) through pro-activeness and reactiveness.



Project Partners

The MedPAge project is part of the [DFG-funded](#) German Priority Research Programme [SPP-1083: "Intelligent Agents in Real-World Business Applications"](#) which was initiated in 1999. All SPP projects are carried out as so-called tandem projects: One partner from business economics and one from computer science. Our project partner is the [Business Informatics Chair](#) at the University of Mannheim. In addition, we work together with computer science partners from other SPP projects, most notably with the [RWTH Aachen](#) and the [University of Würzburg](#) .

Project Approach

In MedPAge **patients** and hospital **resources** are represented as autonomous agents with individual goals. For coordination we conceived a **market-based mechanism** called MedPaCo (Medical Path Coordination), in which the patient agents negotiate with each other - based upon individual health state dependent cost functions - over the scarce hospital resources. A hospital **simulation environment** allows the benchmark of different coordination mechanisms including the current practice in hospitals. In contrast to the resource agents that only see the patients as entities to be treated, the patient agents merely see the medical actions as tasks that need to be performed. Due to these opposing forces, the patient agents ensure that the resource agents also consider the treatments of the patients outside their unit (without any explicit knowledge of them) and vice versa.

For the coordination of the patients, i.e. to allocate the patients to the scarce hospital resources, we use the MedPaCo mechanism, in which the patient agents negotiate with each other in order to reach their individual goals. Within a market mechanism only prices for specific goods are communicated, keeping all other information private to the market participants. Additionally, a market facilitates a dynamic environment, where the market participants take actions according to their current (dynamically changing) situation. The price mechanism leads to an efficient resource allocation because the resources are assigned to the agents that are willing to pay the highest price (assuming that the agents bid rationally, these are the agents that gain the highest utility from this resource).



[MedPAge prototype](#)

Further Information

MedPAge project page: <http://vsis-www.informatik.uni-hamburg.de/projects/medpage/>