

theoretical issues such as description logics, non-monotonic logics and extending KQML to derive the language "COOL". The work of the present invention differs markedly from this in that it provides a tool-kit for defining and generating real agent-based control software for real applications, and goes well beyond the  
5 general academic nature of the Toronto work.

A particular problem arises with "collaborative" agents. Collaborative agents are a group of agents which co-operate with one another to co-ordinate their activities in performing a particular task. Such co-operation may be necessary because know-how, resources or processing power may be distributed  
10 across the environment or across the agents in the system. The problem with collaborative agent systems is the need to co-ordinate their activities in a problem- and context-dependent manner.

An example of a collaborative agent system, used in this case in communications network management, is described in international patent  
15 application number W095/15635, in the name of the present applicant.

According to a first aspect of the present invention, there is provided a software building environment, for building a software system for use in control, monitoring and/or management of a process or apparatus, said environment comprising at least one software module, means for capturing data for loading a  
20 copy of said module for use in said software system, and means for generating the software system comprising at least two of said loaded modules.

Each loaded software module preferably comprises a collaborative software agent. It will therefore comprise or have access to at least one collaboration or co-ordination strategy, expressed for instance as a rule or  
25 algorithm. Said at least two loaded modules together can then provide a multiple agent community for controlling, monitoring and/or managing the process.

Embodiments of the present invention can provide collaborative agent building environments with which system developers can define a set of agents to work together in a system, organise them in relation to one another in whatever  
30 manner they choose, imbue them with co-ordination abilities suitable for the problems the agents are being designated to tackle, support links from the agents to said process or apparatus they need to communicate with, to control or update for instance, and generate the software code for the agents.