who is neither a superior nor a subordinate. Peer relationships are the default, and refer to any agent known by the base agent who is neither a superior, subordinate nor co-worker.

Some of the implications of the different organisational relationships on negotiation and coordination strategies are discussed below, under the heading **"4.4 Step 4: *Agent Coordination Strategy Specification 510*"**.

Note that organisational relationships are **not** by default bi-directional. That is, although an agent X might believe Y to be her subordinate, it does not necessarily imply that Y believes X to be her superior. It can also be noted that the Shop 2 Table shows no peer relationship for the A2 agent. This reflects the fact that the A2 agent has no knowledge of the manager of Shop 1, the A1 agent.

Note also that one agent's beliefs about a second need not be consistent with a third agent's beliefs (data) about the second. For example, in the Shop 1 Table, A1 believes C1 can produce Item2 at a cost of 4 units and using 3 time units. However, B1 believes differently that C1 produces Item2 at cost 3 units and using 5 time units. This may in practice arise if agents have different service level agreements , for instance.

2.5 Planner & Scheduler 220

The role of the planner/scheduler is to plan and schedule the tasks to be performed by the agent. Conventional planning (e.g. means-end analysis as in the SIPE or O-PLAN planners - see papers in IEEE Expert: "Intelligent systems and their applications", Vol 11, No. 6, December 1996), and scheduling (e.g. job-shop scheduling) techniques can be used. However, the planner and scheduler 220 of the CABS agent has additional, innovative aspects. For instance it can offer an overbooking facility to ensure maximised use of resource.

The implementation of a CABS agent's planner/scheduler 220 is a means-end partial and hierarchical planner. Referring also to Figure 9, it maintains a commitment table (or database) 245 which is a two-dimensional array with rows 900 denoting available processors and columns 905 denoting time points (using an integer representation of time). The base time ("0") of the table is the current time, while the maximum time is the current time plus the maximum plan-ahead period of the agent.