

## Chapter 7

# IMPLEMENTATION SCENARIOS OF THE INFORMATION SYSTEMS

An efficient variety and complexity management has been identified as a necessary condition for the success of mass customization. By means of the information systems (advisory system and multi-agent system) that were developed in chapters five and six, the most relevant complexity problems were addressed, namely the external and internal complexities. The external complexity is perceived by customers, whereas the internal complexity is experienced inside the company's operations and manufacturing related tasks. The advisory system only addresses the external complexity problem by assisting customers in their buying decision. However, the multi-agent based concept copes with both complexity problems at the same time by forming suitable product configurations that meet specific customer requirements as well as supporting the mass customizer in making optimal decisions with respect to the variety steering task. In this chapter, we refer to the multi-agent *based* system as the system that includes all of the components that are necessary for variety formation and steering, excluding the configuration system, product constraints agent and advisory system. These components are: the target costing agent, Dutch auction agent, validation agent, module agents and platform agents.

The proposed information systems cannot be efficiently implemented without taking into account the supplier's specific situation and requirements. They have to be scaled and integrated into the supplier's existing information system landscape. In the context of integrated information management, the developed systems should support the information system infrastructure that already exists. At the same time, they need to be supported by the existing information system infrastructure. Therefore, the characteristics of the existing system have to be considered

while making the decision about which system to be implemented. In this chapter, we depict two possible scenarios. The first scenario concerns the implementation of the advisory system and the second scenario deals with the implementation of the multi-agent approach. We also outline the advantages and disadvantages of each implementation case if certain preconditions are satisfied.

## **1. SCENARIOS AND CONDITIONS FOR A SUCCESSFUL IMPLEMENTATION OF THE INFORMATION SYSTEMS**

Before depicting the possible scenarios according to which the proposed information systems can be implemented, it is first necessary to determine in which case the advisory system may be more suitable than the multi-agent approach and vice versa. We refer to the multi-agent *based* system as the system that consists of the target costing agent, Dutch auction agent, validation agent and agent pool which includes module and platform agents. Whereas the advisory system can be implemented as a stand-alone technical solution, the multi-agent based approach requires that an advisory component to have been implemented already. In effect, the mechanism designating the platform and module agents that are allowed to participate in the formation of product alternatives as well as the coordination process to a great extent depend on customer requirements. Therefore, an advisory component is necessary in order to make the multi-agent based system work efficiently. It is worth noting that the configurator, product constraints agent and advisory component are not considered to be elements of the multi-agent based system because of the following reasons:

- It is assumed that a product configuration system already exists. Furthermore, a configurator is a well-established software system that can be used in a stand-alone approach.
- From a technical perspective, it is more advantageous to separate the multi-agent based system from the configurator. In this context, the product constraints' agent should be seen as an interface between both systems.
- The advisory component can be implemented in a stand-alone version. It is conceivable to firstly implement the advisory system in a stand-alone approach and then to extend it with the multi-agent based system.