Chapter 10
MIS in the Service Factory of the Future

ABSTRACT
This chapter deals with Management Information Systems situated in a futuristic context, namely that of a “service factory” of the future. The vision of such a service factory is to become a major driver for the large-scale exploitation of multi-agent information processing technologies, e.g. the manufacturing sector in a service-oriented view, and explore the potential of the “production as a service” approach as both an enabler and a catalyst towards the realisation of intelligent and environmentally conscious factories. In the chapter, the author presents the service factory concept and analyses its potential business impact. The chapter includes two appendices related to the real world validation of the concept with members of the industrial community.

INTRODUCTION

The area of services concentrates annoyingly much interest in the last five years. We shall elaborate in this section on the role and usage patterns of MIS as part of the process structural grid of a service factory of the future. The vision of such a service factory is to become a major driver for the large-scale exploitation of multi-agent information processing technologies for e.g. the manufacturing sector in a service-oriented view and explore the potential of the ‘production as a service’ approach as both an enabler and a catalyst towards the realisation of intelligent and environmentally conscious factories.

Competitive cost pressures drive the componentization and provision of repeatable service and the exploitation of economies of scale. The result can be remote delivery from lower-cost offshore or nearshore service-delivery centers. However, individuals involved with the delivery function may strive to retain their personal value-add by attempting to maintain a strong bespoke content, which relies on their personal competence for delivery. Thus, conflict arises as the offering development teams seek more industrialized, component-based, repeatable service offerings, while the individuals delivering the service want to see their roles continuing and act to avoid being replaced by casual or offshore resources.

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10.1. THE SERVICE FACTORY CONCEPT

The ‘production as a service’ paradigm is not necessarily a novelty of this author... For the context of our Service Factory is built on top of three concepts:

1. Production components abstraction,
2. Production configuration and planning based on service composition by the means of distributed agent-based planning and
3. Flexible execution and control.

When we speak about services in the scope of the production processes, we mean the ability to abstract the production components and describe it’s abilities in the service oriented manner. The production configuration, planning and control then benefits from the agent oriented technologies and also service oriented paradigms (which both share a lot of common conceptual approaches). The factory processes are divided to the three levels as depicted in the Figure below:

- Upper level represented by Service Factory platform for standard factory processes support, human interaction, etc.
- Middle level for Multi-agent system based service abstraction of the production resources and production abstraction and
- Lower layer based on production process resources embedding and modelling.

Our approach targets flexibility and ease of production reconfiguration by means of a collection of highly specialized agents modelling the manufacturing process and controlling it alike. Besides methods of collective decision making the methods of adjustable autonomy for run-time update of policies and norms in the manufacturing enterprise can be utilized.

For a company to reposition itself according to such a service-oriented architecture and mentality would mean the following:

- Investigation of the prospects for application in the company, accompanied by a state-of-the-art in manufacturing control and planning as well as in service oriented architectures,
- Development of a complex multi-agent model of an abstract manufacturing process for testing and evaluation of the production as a service concept and
- Analysis of applicability of the concept modelled in (ii) in cooperation with business units and departments of the company.

In this context what is needed as a first step is the Development of the Service Factory Context Reference Model: