Chapter 8

Service Design and Process Design for the Logistics Mall Cloud

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ABSTRACT

This chapter presents some actual results from two big German Cloud projects: the Leading-Edge Cluster project Service Design Studio and the associated Fraunhofer Innovation Cluster Cloud Computing for Logistics. Existing services can be enhanced using the Service Design Studio environment and then be deployed and offered in the Logistics Mall, which may combine them using process models. To reach these objectives, different standards are combined for service description in functional and business view, business object description in domain and technical view, and process model description on different abstraction levels. First results are already in use by the logistics industry. These innovations together have the potential to advance the logistics market towards modern IT strategies. Flexible, individual logistics business process models allow small and medium enterprises a technological catch up with large companies and to focus on their core business.

INTRODUCTION

For many markets, logistics is a cost factor and a competitive factor. In Germany, it has a volume of more than 200 billion €/year. It is Germany’s third-largest sector following the automotive industry and mechanical engineering. Most logistics companies (over 90 percent) are SMEs (small and medium enterprises) in Germany.

The flexibility and dynamics of logistics business processes has reached a level which can no longer be handled by conventional forms of organization - efficient IT solutions are mandatory. Most logistics companies, especially SMEs, do not have sufficient IT expertise, capacity or capital required to close the gap between requirements and status quo in logistics IT. SMEs usually have small IT departments with a small number of employees.
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...and limited capabilities. Deficits include outdated technologies, high, fixed costs of IT operations, poor documentation, security deficits, expensive licensing models, high maintenance efforts, and many contract partners. A flexible adjustment of business processes and interfaces is complex, lengthy, expensive and risky.

Cloud computing (especially in SaaS models) and BPM (business process management) are able to solve most of these problems, but there are serious barriers to an enterprise-wide use of BPM software: cost, resource availability, feature/function limitations and cultural barriers (Silver, 2009): BPM software (on premise) often is expensive in license and maintenance cost and new IT resources are often needed to cover peak loads. High cost per employee and extensive training is needed and the ROI is initially unproven. As BPM aims at change and optimization of business processes, it provokes resistance about possible risks.

BPM software in the Cloud (BPaaS) reduces these barriers. Its goal is to raise BPM from isolated projects to a broad pragmatic enterprise-wide deployment. BPaaS enables usage-based pricing without initial cost or maintenance cost (which reduces TCO) as well as on demand dynamical scaling of virtualized resources and tools being available over the net.

Especially for SMEs with few staff and limited financial resources it is important to respond quickly and inexpensively to changing circumstances. Their business people should be empowered by simple Web tools to build process models from available domain-specific building blocks, redesign and experiment and iteratively improve and deploy process models easily and quickly with low cost and low risk. This requires BPaaS techniques to be able to bridge the business IT gap, as described in this chapter.

Cloud computing is considered as a megatrend, which will have an impact on the use of information technology in all application domains. In their report on the future of Cloud computing (Jeffrey & Neidecker-Lutz, 2010) a European expert group identifies the provisioning of application-area-specific Cloud services, also called “vertical Clouds”, as a significant business opportunity. The Leading-Edge Cluster LogisticsRuhr (http://www.effizienzcluster.de) shares this view and has declared the development of a domain-specific logistics Cloud as a strategic objective. It is Germany's biggest logistics research initiative including 120 enterprises and 11 research institutes. The use of modern information technology for logistics is summarized in its leading topic logistics-as-a-service. With the use of Cloud technologies and service-oriented architecture (SOA) principles, the Service Design Studioi, as one of about thirty projects in the LogisticsRuhr cluster, together with the associated Fraunhofer Innovation Cluster Logistics Mall (http://www.ccl.fraunhofer.de/en.html) are targeting the individualization of logistics business processes and services by standardization of reference services, process model fragments and business objects.

The Logistics Mall (Holtkamp et al., 2010) available today (http://www.logistics-mall.com) is a Cloud-based virtual marketplace for logistics applications and a usage environment for rented logistics applications hosted in a community Cloud (according to the NIST definition of Cloud computing (Mell & Grance, 2009)). It is currently extended towards also selling and using services and process models to orchestrate applications, services and people in the Cloud. By using offers from the Logistics Mall, investment in an own infrastructure and the corresponding know-how can largely be avoided. Demand-driven access to rented customized software and services via standard Web browsers becomes possible. After contract signing, billing is done based on resource usage; the user does not pay for unused features. This contrasts expensive license fees for monolithic, multi-featured logistics applications on premise, like a warehouse management system available today. Such systems are successively replaced by smaller interoperable subsystems, provided as services and combined by customer-individual
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