Chapter XI

Merging and Outsourcing Information Systems with UML

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ABSTRACT

Businesses can change their business structure by merging with other companies or, on the other end of the spectrum, by smoothly outsourcing some of their business processes to other more specialized parties. In this paper, we will concentrate on conceptual modelling of merging and outsourcing information systems. Merging of a collection of information systems will be defined as the construction of a global information system that contains exactly the functionality of the original collection of systems. Such global information systems are called federated information systems, when we wish to address the situation where the component systems are so-called legacy systems; that is, systems that are given beforehand and that are to interoperate in an integrated single framework in which the legacy systems are to maintain as much as possible their respective autonomy. Two major

problems in constructing federated information systems concern achieving and maintaining consistency, and a uniform representation of the data on the global level of the federation. The process of creation of uniform representations of data is known as data extraction, whereas data reconciliation is concerned with resolving data inconsistencies. Outsourcing of an information system, on the other hand, will be defined as the handing over of part of the functionality of the original system to an outside party (the supplier). Such functionality typically involves one or more operations, where each operation satisfies certain input and output requirements. These requirements will be defined in terms of the ruling service level agreements (SLAs). We will provide a formal means to ensure that the outsourcing relationship between outsourcing party and supplier, determined by an SLA, satisfies specific correctness criteria. Formal specifications, as offered in this paper, can prove their value in the setup and evaluation of outsourcing contracts. We shall describe a uniform semantic framework for specification of both federated and outsourced information systems based on the UML/OCL data model. In particular, we will show that we can represent so-called exact views in UML/OCL, providing the means to capture the duality relation between federating and outsourcing.

INTRODUCTION

Businesses are, by nature, dynamic, and change continuously. Because of different economic prospects they grow in size and portfolio, or they have to reduce one of these aspects. There are several ways to accomplish growth or reduction. A smooth way may consist of hiring new employees or of outsourcing parts of one's noncore business processes to specialized parties in the market. More drastically, a company can merge its business with that of another business department, or even with that of another company. On the opposite side, a company can be forced to split its business into separate, independent business departments. The reason for such a merge or split may be of a different nature, for example, financial, organisational, or legal (Smith, Mitra, & Narasimhan, 1998). Merging is also known as *integrating*, and in this paper we will concentrate on integration as the result of *federating*. By federating we wish to address the situation where the component systems are so-called legacy systems; that is, systems that are given beforehand, and which are to interoperate in an integrated single framework in which the legacy systems are to maintain, as much as possible, their respective autonomy.

Splitting is also known as *unbundling*, and in this chapter we will concentrate on *outsourcing* as a particular aspect of unbundling. A variety of outsourcing models have been developed (Looff, 1995); outsourcing can range from having all the business processes (such as development, maintenance, and operations) performed by an outsourcing partner, up to having a contract with a partner performing only one single business task. Also, we find a growing interest in offshore outsourcing, where the bulk of processing is done in a low-cost country, with a small on-site staff at the customer's facility to handle the relationship management and coordination with the offshore parties.

The consultancy firm Forrester (2004) analyzed a number of large outsourcing ventures in the beginning of 2004; they found a European-wide trend towards large investments in outsourcing. Furthermore, the leading outsourcing category was that of infrastructure services. Second and third were the category of applications management and desktop outsourcing, and the category of outsourcing helpdesk and support services.

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