Chapter XIX
Systems for Interorganizational Business Process Management

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ABSTRACT

This chapter is devoted to automated support for interorganizational business process management, that is, formation and enactment of business processes that span multiple autonomous organizations. A treatment of intra- and interorganizational business processes is included to provide a conceptual background. It describes a number of research approaches in this area, including the context of these approaches and the design of the systems proposed by them. The approaches are described from early developments in the field relying on dedicated technology to current designs based on standardized technology from the service-oriented context. The chapter thereby provides an overview of developments in the area of interorganizational business process management.

INTRODUCTION

In the past, many organizations operated their business processes in a rather stand-alone mode. Although cooperation scenarios with other organizations obviously existed, these scenarios were mostly based on the exchange of physical goods and information (e.g., on the basis of electronic data interchange) – not on the execution of integrated business processes by the collaborating partners. A number of developments has changed the context in which organizations collaborate, however. In the first place, products and services produced have become far more complex, thus requiring more business capabilities and hence larger networks of collaborating organizations.

The fact that competition forces organizations to retract to core business activities only amplifies this development. Secondly, both product specifications and market circumstances have become much more dynamic, thereby requiring business networks to become more dynamic too. Thirdly, market paradigm changes like mass customization and demand chain orientation require much tighter synchronized business processes across individual organizations in a business chain. Fourthly, time pressure has become much greater in the setup and execution of collaborations between organizations. These four developments are forcing organizations to pay much more attention to *how* they cooperate, not only to *what* they exchange. In other words: organizations are forced to operate in business processes that span business chains and take part in the design and management of these interorganizational business processes.

To deal with the complexity of interorganizational business processes and obtain the required efficiency in setting them up and executing them, automated systems are required for interorganizational business process management. These automated systems should support a number of tasks. They should provide support for the design or configuration of interorganizational business processes. As we will see in the sequel of this chapter, support may be in the form of interactive design tools, but may also go into the direction of fully automatic configuration of interorganizational business processes, based on predefined subprocesses within participating organizations. These automated systems should support the automated management of the execution of interorganizational business processes, i.e., that process logic that actually links the internal business processes of multiple autonomous organizations. Then, these systems should support the synchronization of interorganizational business processes with the internal business processes of the organizations.

This chapter discusses the development of systems for interorganizational business process management. It first provides a background by discussing the differences between intraorganizational and interorganizational business processes. A three-level framework is explained that shows how to relate these two kinds of processes. Then, it discusses early approaches towards interorganizational business process management. Next, approaches, architectures and technologies are presented of three major projects from the research experience of the author: CrossFlow, CrossWork and XTC. In doing so, attention is paid to both business process specification and business process enactment, including contractual and transactional aspects. The discussion in this chapter explicitly shows the development from 'traditional' workflow management via advanced interorganizational structured business process management to service-based, highly dynamic business process interaction. The chapter ends with a conclusion presenting main observations from the past and highlighting major trends in current developments.

INTERORGANIZATIONAL BUSINESS PROCESSES

In this section, we explain what interorganizational business processes are. We first discuss the concept of a business process within one organization: an intraorganizational business process. Then, we move to the concept of a business process across multiple organizations: an interorganizational business process. We will see how control flow interfaces are important here. To explain how intra- and interorganizational processes are related, we discuss a three-level framework. In the last part of this section, we add the aspect of dynamism to interorganizational business processes, i.e., the aspect of collaboration networks that change over time. One thing is important to understand here: when we speak of 'organizations', these may be autonomous business entities (like commercial

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