Chapter 10
Reference Architecture for Cross–Company Electronic Collaboration

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ABSTRACT

Cross-organizational electronic collaboration is about to gain significant momentum and facilitates the emergence of a globally networked information service economy. However, existing solutions for the realization of such business relationships still exhibit weaknesses with respect to both managerial and technological aspects. In this work, we propose a service-oriented reference architecture for electronic business media that overcomes the drawbacks of today's business-to-business (B2B) software products and services. Based on the St. Gallen media reference model, this reference architecture incorporates the design principle of modularity that proved critical for the success of numerous artifacts in other more mature industries. In particular, we investigate and revisit the principle of modularity with respect to its role in the computer industry and transfer it to the context of organizing and implementing electronic cross-company collaboration. On the basis of a case study in the field of public administration in Switzerland, we show its real-world applicability and its improvement potential.

INTRODUCTION

Cross-organizational electronic collaboration is about to gain significant momentum but still shows weaknesses with respect to productivity, flexibility, and quality (Malone, 2001; McAfee,

2005; Porter, 2001). Existing point-to-point installations provide only limited functional richness and low reach. Communities of firms that employ such technologies today are frequently controlled by a large, economically predominant participant, leading to a multitude of different standards of different scope and granularity over time (Frenzel, Schroth, & Samsonova, 2007).

Table 1. Selection of B2B software and service providers (Lheureux et al., 2007)

Vendor	Software			Service	
	Multienterprise SW	MFT	EDI Transl.	IaaS	B2BPO
Axway	x	x		x	
Crossgate	x			x	
E2Open				x	x
eZCom Software	x			x	x
Hubspan				x	x
Inovis	x	x	x	x	x
Seeburger	x		x	x	
Sterling Com.	x	x	x	x	x
TietoEnator				x	x

These substantially different standards prevent a common understanding of exchanged data among a wide mass of organizations, while the high cost and complexity of existing solutions impede fast adoption by potential users. Today, a new generation of providers of software and services for multienterprise interaction is about to emerge and allows for richer interaction while reducing the costs of electronic transactions heavily. Integration service providers (see Table 1) already offer hosted multitenant environments for functionality such as reliable and secure communication, trading-partner management, technical integration services, and application services (Lheureux, Biscotti, Malinverno, White, & Kenney, 2007). Those hosted offerings are referred to as IaaS (integration as a service). As opposed to the mere outsourcing of technical infrastructure, business-to-business process outsourcing (B2BPO) also comprises the outsourcing of a complete B2B project (including the workforce and their structural as well as process-oriented organization). Multienterprise or B2B gateway software is considered comprehensive integration middleware for the consolidation and centralization of a company's multienterprise data, and for application and process integration and interoperability requirements with external business partners. The more traditional electronic data interchange (EDI) translators and managed file transfer (MFT) software represent highly message-focused approaches with rather limited functional scope.

However, these products and services still exhibit weaknesses with respect to both managerial and technological aspects. The focus on automation rather than business innovation as well as an inherent enterprise rather than multienterprise perspective represent two major remaining challenges toward business media for efficient and effective cross-organizational interaction (Lheureux & Malinverno, 2006). Also, many B2B communities are still being set up as hardwired, thus inflexible and stand-alone island solutions for highly specific purposes. However, the frustration of organizations in building and supporting multiple single-purpose portals and electronic business communities grows as both the organization and implementation do not allow for sufficient flexibility, extensibility, decentralized management, and operational efficiency (Lheureux et al., 2007). According to Gartner research, firms desire integration services supporting "multiple protocols, multiple data formats, multiple onboarding approaches, higher-order integration features (for example, in-line translation, data validation and business process management), BAM [business application monitoring] (for example, process visibility and compliance management), and

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