Chapter 13
Advancing Interoperability for Agile Cross-Organisational Collaboration: A Rule-Based Approach

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ABSTRACT

The level of adoption of advanced integration technologies, by private and public organizations, in support of their electronic collaborative business transactions is still relatively low, especially among Small and Medium-sized Enterprises. Current solutions often lack a common understanding of the underlying business processes, document semantics and business rules that are imposed on them in different sectors and countries. Furthermore, software applications are not able to cope with the huge variety of differentiation in process and document semantics, stemming from the highly diverse requirements of the stakeholders. This study presents a comprehensive Model-Driven Architecture for enabling agile cross-organisational collaboration, in an international context, by integrating business and legal rules in private and collaborative processes, business documents and their resulting service orchestrations. The resulting framework, that was mostly developed and applied in the course of the EU-funded research project GENESIS, ranges from graphical process and data models and declarative rule structures to the technical specification of a hybrid software architecture for integrating rule with process and data models.

DOI: 10.4018/978-1-61520-887-6.ch013
INTRODUCTION

Cross Organisational Collaboration (COC) emerges as a ruling business paradigm today. The ever growing adoption of novel technologies and their consequent business practices such as the web, smart-mobile devices, collaborative middleware, service outsourcing and service in-sourcing, are composing a so-called “flattered” corporate reality for business and organizations worldwide (Friedman, 2005). The economic convergence towards unified economic markets, which share technology, business practices and a relatively common underlying legal framework, and span across country borders to facilitate the exchange of products and services, reaffirms the globalized nature of contemporary economy. Europe constitutes a solid example, where the advent of a unifying legal framework that favours electronic transactions is steadily impelling enterprises and governments to engage in cross-organisation transactions (Bolkestein, 2006), (EIF, 2009), (INSPIRE, 2007). The arising issues are of such importance that in Europe they have already triggered the launch of EU-wide collaborative research ventures in the areas of electronic IDs (STORK, 2008) and eProcurement (PEPPOL, 2009).

Following the trends of economy, recent developments in information technology and information systems (IS/IT) such as e-hubs, web services, portals and enterprise middleware shift the role of enterprise systems from an internal to an external orientation and mandate for new approaches and capabilities that can facilitate inter-organisational interaction instead of the mere support of internal operations (Daniel et al, 2005). In numbers, it is expected that by 2011, midsize- and large companies will have at least doubled the number of multi-enterprise integration and interoperability projects they’re managing and will be spending at least 50% more on Business to Business (B2B) projects, compared to 2006. Furthermore, from 2008 to 2013, multi-enterprise traffic will have at least tripled. (Lheureux et al, 2008).

In this volatile context of global economy and new technology, modern enterprises need to be able to align into virtual alliances, thus responding effectively and swiftly to competitive challenges. They are required to streamline both internal and external business processes by integrating the various packaged and home-grown applications found spread throughout an enterprise (Papazoglou et al, 2007). Furthermore they are required to achieve this level of integration across company borders and in many cases even across country borders.

However, at present, existing solutions deal with the issues of this level of collaboration fragmentarily, mainly in the form of industry driven or open source middleware tools such as (Biztalk, 2009), (OAS, 2009), (Netweaver, 2009), (Mule, 2009), (ServiceMix, 2009), (FUSE, 2009).

In this chapter we propose an architectural framework that can help system designers and technology managers to setup a collaboration solution for their enterprise by incorporating the necessary provisions to achieve integration in terms of processes and data without neglecting the business characteristics stemming from their underlying business logic and business policies. Important novelty of the proposed framework is the incorporation of business rules in the overall architecture, a characteristic that can greatly assist in achieving a loosely-coupled, dynamic collaboration among enterprises from different countries.

TECHNOLOGY COLLABORATION

MAJOR INHIBITORS AND ENABLING TECHNOLOGIES

Types of Technology Collaborations

Technology collaboration is defined as the integration of people, systems, processes and infrastructure across organisations, borders, nations and world regions to enable productive teamwork and mutual goal attainment (Romano et al, 2007). As it is understood by the previous definition,
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