Chapter 108
Towards Public Services and Process Integration:
A Domain-Specific Modeling Approach

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ABSTRACT

Software platforms for e-government transactions may differ in developed functionalities, languages and technologies, hardware platforms, and operating systems that support them. Those differences can be found among public organizations that share common processes, services, and regulations. This scenario hinders interoperability between these organizations. Hence, to find a technique for integrating these platforms becomes a necessity. In this chapter, a rule-based domain-specific modeling environment for public services and process integration is suggested, which consists of common identified public service elements and a set of process integration rules. This approach provides the needed integration or interoperability pursued in this domain. Furthermore a service and process model is proposed to formalize the information needed for integration of both. A set of integration rules is also presented as part of the modeling environment. This set of integration rules completes the proposed model to meet the business requirements of this domain.

INTRODUCTION

Governments worldwide are becoming more dependent on Information and Communication Technologies (ICT) in their everyday transactions. This results in an increased study of e-government in recent years and the development of theoretical and conceptual models to understand its different aspects (Dawes, Pardo, & Cresswell, 2004; Gil-garcia & Pardo, 2005; Gupta, 2003). Although, there is not any global accepted definition of the e-government concept as argued in (Halchin, 2004). Some of the most relevant definitions are provided by (Means & Schneider, 2000; Abramson & Means, 2001; Fountain, 2001).Only with the purpose to understand this domain, one of the

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most generic and accepted approaches must be mentioned in this chapter. Despite the encountered differences, an overall definition of e-government can be defined *as the use of technology, especially Web-based applications to enhance access to and efficiently deliver government information and services*. Furthermore in (Abramson & Means, 2001) there is a classification of three major categories or relationships called Government-to-Government (G2G), Government-to-Citizen (G2C), and Government-to-Business (G2B). This chapter mainly focuses on G2G relationship where the information sharing between Public Administrations' (PAs) processes and services takes place. These information interchanges or interoperability between PA organizations have been classified as a relevant subject and a critical prerequisite for the adequate performance of PA systems (Klischewski, 2004; Peristeras, Loutas, Goudos, & Tarabanis, 2007; Tambouris, Manouselis, & Costopoulou, 2007).

The European Interoperability Framework for Pan-European e-Government Services (EIF) (Overeem, Witters, & Peristeras, 2007) of the European Commission defines interoperability as the ability of Information and Communication Technology (ICT) systems and of the business processes they support to exchange data and to enable sharing of information and knowledge.

EIF defines three interoperability types such as the technical level, semantic level and organizational level where this chapter focuses on. The interaction among different business processes and services is addressed. At this level the following aspects are covered:

1. **Domain Specific Integration Modeling:** This includes the definition of the metamodel that contains common processes and services elements to undertake their integration.
2. **Business Rules Integration:** This describes the construction of the integration knowledge base used to validate instances of the defined model both in modeling time and runtime.
3. **Domain Specific Modeling Editor Development:** This address the description of the necessary steps to undertake the development of a domain specific modeling tool as proof of concept for the proposals introduced in this chapter.

BACKGROUND

Process modeling has gained a lot of attention over the past decade involving process reengineering and innovation (Wang & Wang, 2006). The use of Service Orientated Architectures (SOAs) has changed the process orientation to service orientation modeling approach. These architectures are mainly dedicated to issues related to advertise, discover, invoke, compose and monitor services available from multiple providers over the Web. This change resulted in the development of the Web Services (Alonso, Casati, Kuno, & Machiraju, 2004; Moitra & Ganesh, 2005).

There are discussions on different approaches to undertake process-service integration modeling. The workflow and SOA approaches are discussed in (Gortmaker, Janssen, & Wagenaar, 2005) presenting two reference models: Workflow Reference Model (Eder & Liebhart, 1996) and the SOA reference model (Papazoglou & Georgakopoulos, 2003). Relevancy of these models in the implementation of service-process integration in e-government is questioned. According to (Gortmaker et al., 2005), the workflow reference model is mainly focused on technology and therefore fails to address the non-technical integration issues. Instead the SOA reference model manages to address several of these issues in a rather descriptive way. Hence the SOA model manages the required functionality but does not indicate how this should be implemented. Therefore, the conclusion from this works is that a new domain specific process-service integration model is needed to facilitate process integration in e-government context.