Chapter 20

DSL TUNNOS Commerce: Model–Driven Architecture Applied to E–Commerce Platforms

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ABSTRACT

In the last decade, e-commerce has achieved rapid evolution from simple and static systems on the Web that provided information and promoted products to complex systems and dynamic applications that support business processes. Reuse and interoperability are strategies to face the challenge in software development in a dynamic context and rapid technological changes. To achieve these strategies, it is necessary to work with conceptual models that faithfully collect business semantics and, through of automatic tools (or semiautomatic) model transformation, get the model to be implemented in the appropriate platform. In this chapter, to successfully perform such a task, the authors work on a methodological framework with model-driven technologies that are considered the most appropriate approach, both technically and economically, so that organizations can easily adapt to the technological changes that arise at any time.

INTRODUCTION

With the rapid growth of the number of transactions conducted via electronic channels such as the Internet, there has been an ever increasing demand to develop advanced computational tools to facilitate the use of e-commerce platforms.

Electronic commerce is the buying and selling of products or services over electronic means such as the Internet and other computer networks. Its implementation offers advantages to buyers and sellers; the use of electronic commerce facilitates sellers to access narrow market segments that are widely distributed while buyers can benefit from...
access to global markets with greater availability of products from a variety of offers at reduced costs. This situation improves product quality and the creation of new forms of business (Grandon E. & Pearson M., 2004).

Electronic integration has led to dramatic changes in the definition of an enterprise, with the emergence of virtual enterprises whose capabilities to offer their products to the market are defined largely by their ability to organize and maintain a network of business relationships rather than for their ability to produce a product or provide a service. To understand an individual company, we need to study business networks in which it is immersed (Zwass, 1996).

Some challenges that business processes and technology have are the requirement of a high degree of integration and interoperability, shorter development cycles, quality, technology changes, and scarce qualified personnel (Soto & Meroño, 2009). There would be fewer problems in electronic commerce if all companies used the same information systems, the meanings of the terms and the same modes of operation (Nurmilaakso & Kotinurmi, 2004).

Differences in technology infrastructure between companies are inevitable (Huang, Tzeng, & Ho, 2011). Standards can provide a way to reduce the difficulties of interoperability giving order to the complexity and reducing the variety. The standardization of business documents and business processes promotes interoperability through harmonization of the meanings of the terms and modalities of operations (Nurmilaakso, 2008).

The Model Driven Architecture (MDA) is the proposal of the Object Management Group (OMG) to address the challenges of current software systems that are constantly changing and highly interconnected. MDA is based on the concepts of Model-Driven Engineering (MDE) but by using OMG standards such as: Meta-Object Facility (MOF), XML Metadata Interchange (XMI), Object Constraint Language (OCL), Unified Modeling Language (UML), among others. With the combination of these languages and the use of mechanisms such as abstraction, refinement and views, MDA defines a set of models Computation Independent Model (CIM), Platform Independent Model (PIM), Platform specific Model (PSM) which define the system from different perspectives and levels of abstraction.

Enterprises, otherwise forced into bankruptcy, have to implement changes to maximize the opportunities offered by electronic commerce. Enterprises, otherwise forced into bankruptcy, have to implement changes to maximize the opportunities offered by electronic commerce. Therefore, the effective implementation of the strategy for e-business transformation turns out to be a critical factor for an sustainable and competitive advantage (Qingfeng, Wenbo, & Lihua, 2008). The key features of this paradigm is that makes use of models of different levels of abstraction and provides model transformation in order to automatically transform a model into another as well a model into implementation code (Boubeta-Puig, Ortiz, & Medina-Bulo, 2014).

**E-COMMERCE METAMODEL**

To generate the e-commerce metamodel the first step was to select three e-commerce platforms. Were selected platforms Magento, Prestashop and Oscommerce because they display in the market and are developed in open resource. We developed a comprehensive study of these platforms were developed mental maps to define a semantic processes and unify interoperability technical, semantic and organizational. The next step was generating an e-commerce metamodel based on previous work. Then was constructing DSL TUNNOS tool.

**Selecting Tools**

The main platforms and content management electronic commerce available in the market were