Web Service Business Context – The Normative Perspective

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ABSTRACT

This paper investigates the normative perspective of the Web service business context. The business context includes modeling of the business entities and their relationships, while its normative perspective deals with responsibilities, rights and obligations of both Web service providers and users. The existing literature and practice confirm the gap between the available Web service infrastructure and current understanding of the Web service business context - especially its normative perspective. The paper uses the Web service solution lifecycle to investigate formal modeling of terms and conditions, creation of the normative context for individual Web services as well as composition of Web services and creation and management of the resulting combined normative context. The main objective of this research is to facilitate better understanding of this phenomenon and ultimately initiate development of the new tools for management of the normative aspect both by the service providers and their customers.

Keywords: composite Web services; normative aspect; deontic logic; conceptual modeling of business context

INTRODUCTION

Web-services (also called e-services) are Internet-based, modular applications, possibly offered by different companies that provide standard interface for efficient integration of business applications across organisational boundaries. As this area is reaching the more mature stage both in terms of the basic enabling infrastructure and applications, Web services have evolved from individual to quite complex composite Web services. They enable flexible, on-demand integration of individual Web services offered by different providers to meet specific business objectives.

At the business level, provision of the composite Web services has resulted in three different business models that are
used in current research and practice. The first one sees a third-party service provider in charge of composition and provision of a composite service made of related but independent individual Web services. For example, a real-estate portal may provide a composite Web service that coordinates a removalist service, a transport service and provision of temporary accommodation, and so forth.

The second model involves self-regulatory and self-coordinated Web services where individual service providers take responsibility to coordinate their services among themselves. This model is applicable to dynamic virtual enterprises where companies assemble their individual services on demand in pursuit of a given business opportunity.

This paper deals with the third model that is based on the concept of a customer (end-user) being in charge of Web service composition. This model is likely to become more and more common, especially with the companies using strategic alliance marketing to promote each others' products and services, encouraging customers (through bonuses and discounts) to compose their related services.

In many respects this is the most challenging concept among all three, as the customer does not have sophisticated tools or expertise to deal with complex services. At the same time, the customer has the ultimate choice not to proceed with a business transaction and will do just that in the case of any real or perceived problem.

Furthermore, the business relationship between service providers that participate in a composite service further complicates this model. Individual service providers can be independent; that is, they are not obliged or expected to coordinate their service provision. The customer using such a composite service is then expected to not only compose the service but also coordinate service execution. On the other hand, service providers can be affiliated, offering a customer additional incentives (special discounts) to combine their services.

Irrespective of the chosen business model, the problem of e-service composition opens up a number of research and implementation challenges, both at the conceptual (business) as well as technical (IT) levels. As the Web service infrastructure is becoming available, more and more researchers recognise the importance of the business context of Web services that includes relationship between business entities and services. Modeling of the business context is the key to composing and executing dynamic business processes (Zhang & Jeckle, 2003). However, currently available Web infrastructure cannot fully "understand nor support modeling of the business context."

There are several different perspectives of the Web service business context. For example, Fauvet et al. (2001) identifies: the control-flow perspective (that establishes the order individual services), provider perspective, data exchange perspective and transactional perspective. There is also a temporal perspective described in Marjanovic (2002). However, one of the important perspectives that is missing from current research and practical implementations is the normative perspective. This perspective in-