SOAda: A New Architecture to Enrich SOA with a Decisional Aspect

Fatima Boumahdi, LRDSI Laboratory, Saad Dahlab University, Soumaa, Blida, Algeria
Rachid Chalal, Laboratory LMCS, ESI (ex: INI), Wadi-Smar, Algiers, Algeria

ABSTRACT

For the last few years, a rise has been observed in research activity in Service Oriented Architectures, with applications in different sectors. Several new technologies have been introduced and even more are being currently researched and aimed to the future. To meet the goals of a successful SOA implementation, enterprises need to reconsider how they provision decision aspect. This paper puts forward one novel idea and architecture about how enterprises move to a new SOA which leverages with decision aspect. In this paper, the authors describe an extended Service-Oriented Architecture - SOAda for supporting a decision aspect. The authors also present our DMS meta-model (Decisional Model of the Service) to define a new set of concepts necessary for modeling the three levels: business, information and decision. Some of them are already known, whereas others are new and are proposed as an element of this work.

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INTRODUCTION

At present, Services Oriented Architecture is mainly intended to intervene on the level of: trade and computing system of the companies by presenting their various applications in the form of a set of independent modules able to be made up called services. Nevertheless, in search of agility, the SOA must exceed the technical framework related on data processing and trade level to touch the decisional level of the company. In this direction, the true challenge consists in extending the SOA to the decisional aspect of the company.

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Several research tasks were interested in the problem of identification of services (Amsden, 2010; Börner & Goeken, 2009; Arsanjani, et al., 2008; Kim & Yun, 2006; Rahmani, Rafe, Sedighian, & Abbaspo, 2006; Erl, 2010; Birol, 2008; Papazoglou & Heuvel, 2006). The majority of this work led to a pragmatic step whose decision aspect is not treated, even not exists. The decisional vision of the company is considered by all the approaches like under process, and it is left as a not developed black box.

However, the increasingly extended use of SOA architecture led that it is not possible any more these days to continue applying such steps all alone, but always at the end, it is necessary to think about of decision-making process. The
goal of our work is to open the black box of the decisional vision, and to show its components according to SOA architecture.

The objective of our work is to answer such finality. To lead to it, we propose to extend the Services Orientated Architecture on the decisional aspect of the company. Thus, the result is a Service Oriented ecosystem directed services which includes services belonging at various levels: trade, information and decisional level. The resulting services guarantee the agility of the company and offer the necessary architecture and infrastructure to adhere to decision scenarios. We called this new architecture based on services and integrates the decisional aspect: SOAda: Service Oriented Architecture with a Decision Aspect.

For the development of this paper, we put some direct questions which we tried to answer:

• What are the various service types (business, information and decisional) which exists within a company?
• What is the relation between the services and the processes of company?
• Which level of granularity is necessary to define for the services in order to ensure an easy management and a maximum re-use?

New concepts were introduced into Service Oriented Architecture with a Decision Aspect (SOAda) in particular the concept of decision service, intelligence service, design service and the choice service. We will define, in this paper, the whole of the concepts which constitute SOAda as well as the relations which exist between them. It is the role of the meta-models which we will present.

STATE OF THE ART

Currently, all the development approaches based on the services proposed by research, consider that the adoption of SOA includes only the trade and the data-processing sight of the company. We briefly present this work according to a chronological order.

Service Oriented Analysis and Design (SOAD) is an approach improved and interdisciplinary of service modeling, suggested by Zimmermann (2009), on the basis of existing development and notations processes.

Service-Oriented Modeling and Architecture (SOMA) illustrates the activities of a modeling method based on service, proposed by Arsanjani, et al. (2008). For the identification and the specification of service, it combines the three approaches of ascending, downward analysis and middle-out.

Ivanyukovich, Gangadharan, and V. D’Andrea (2005) propose the adoption of the process development Rational Unified Process (RUP) for the development based on services. But propose, in addition, to adapt it so that it can answer certain specific characteristics of this type of environment.

A conceptual model, presented by Kim and Yun (2006) and called M4SOD (Method For Service Oriented Development), the goal is to formalize the development process SOA. This method stresses the phases of identification and realization of the services.

Rahmani, Rafe, Sedighian, and Abbaspo (2006) propose an approach of modeling and design of system based on SOA which uses the architecture directed by the models (Model Driven Architecture, MDA).

Service-Oriented Unified Process (SOUP), a development process intended for the system based on SOA and suggested by (Mittal, 2006), re-use the best elements of RUP and XP (Extreme Programming).

Chaari, Biennier, Favrel, and Benamar (2007) proposes the approach the Services Oriented Company which treats the problem of collaboration between firms. Lemrabet, Clin, Bigand, and Bourey (2010) treats also the problem of collaboration.

The recent approaches are developed at the base of the SoaML (Service oriented architecture Modeling Language) language. Currently Three equipped methods use this SoaML language for services modeling. The 1st method was proposed by Amsden (2010), it was integrated in 2.9 version of the SOMA method (Service-
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