Chapter 14
Demand on Computational Intelligence Paradigms Synergy

SOA and Mobility for Efficient Management of Resource-Intensive Applications on Constrained Devices

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Abstract. Enterprises are migrating towards SOA-based models in order to meet the greater than ever needs for integration and consolidation. Besides, driven by the dissemination of more refined mobile devices in the enterprise, and the rapid growth of wireless networks based on IEEE 802.11 WiFi Standards, mobile applications have been increasingly used in mission-critical business applications. The SOA-based next generation mobility management model analyzed here provides a baseline framework for the successful architecting, deployment and maintenance of mobile applications. We introduce and analyze the requirements to the architecture design needed to comply with new mobility management concept development. We also examine the architecture planning and design issues for the successful implementation of mobility management solutions. Furthermore, we provide a scenario example of the framework for SOA (Service-oriented Architecture) mobile appliances implementation, namely, a model that demonstrates “the customer search” mobile application. Finally, we present a practical case, e.g., a “mobile messaging” application, to show how applying a SOA approach can make the writing of mobile clients using remote services simple and intuitive, which in turn can increase the number of services available on the market, as well as their functionalities and features.

1 Introduction

“Synergy” - Benefits resulting from combining two different groups, people, objects or processes– Wiktionary (http://en.wiktionary.org/wiki/synergy).

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To provide market-leading personalization, mobile service providers have to develop an agile IT infrastructure, one that can be reconfigured quickly for new offerings and enables the modification of existing products. Besides, these changes have to be made available immediately in dynamic websites where customers may purchase more phone time and add more services. To build an IT infrastructure that could respond with this kind of agility, a new architecture is required, one in which servers communicate and provide services across disparate domains in a highly reconfigurable SOA-based design. Such a design can enable providers to build functionality as Web services and then expose those services via multiple channels. These channels include: the wireless application protocol (WAP), the short message service (SMS), interactive voice response (IVR), call center, and, of course, the Web (Fig. 1).

By deploying such a SOA-WSD (web service delivery) configuration, service providers can easily scale the architecture at low cost, thus ensuring that its capabilities match the demands of the provider’s fast-growing customer base. Moreover, by using SOA-WSD, they can reconfigure systems quickly and many components that have been developed can be reused. In addition, this platform can ease the integration with other systems from wireless carriers, CRM (Customer Relationships Management) packages, and billing solutions.

![Fig. 1 Enterprise SOA Management Platform [7].](image)

As a result, a new infrastructure model such as a SOI (Service-Oriented Infrastructure) can provide access to the computational resources automatically on demand and deliver the requested services at an appropriate quality level (Fig. 2). This infrastructure model allows mobile devices to use SOA services, and therefore enables the execution of complex, resource-intensive applications on the constrained devices [1 ÷ 6].