

# Enterprise Application Integration based on Service Oriented Architecture

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**Abstract**—Enterprises have invested heavily in large-scale applications software to run their services and business functions. The infrastructure used is often heterogeneous across a number of platforms, operating systems and languages and, thus, there is a huge duplication of functionality and services resulting in a waste of valuable resources and poor response times. Increasingly, the business and IT managers are being asked to deliver improved functionality while leveraging existing IT investment as well as provide flexibility and on-demand services. In this context, Service Oriented Architecture (SOA) is emerging as an attractive architectural style for developing and integrating enterprise applications. SOA promises a better alignment of IT with business, seamless integration of business applications and reduced costs of development and maintenance. Evidence suggests that large enterprises are moving towards this new paradigm. In this paper, we introduce the SOA approach, present the benefits and challenges it offers and provide guidance with respect to enterprise application integration and implementation. The objective is to provide some useful background information for enterprises that wish to embark on the road to application integration via the SOA.

**Keywords**—Service oriented architecture, SOA, enterprise applications integration, EAI, XML.

## I. INTRODUCTION

Enterprises have invested heavily in large-scale applications software such as ERP (enterprise resource planning), SCM (supply chain management), CRM (customer relationship management) and other such systems to run their businesses. The infrastructure used is often heterogeneous across a number of platforms, operating systems and languages. There is, thus, a huge duplication of functionality and services resulting in a waste of valuable resources and poor response times. Increasingly, the businesses, especially those in the global markets, are being asked to deliver improved functionality of services, while leveraging existing IT investment, as well as provide the following:

- Business agility
- Meeting customer demands
- Reduced time to market
- Continuous process improvement
- New channels of business
- Business architecture that is *organic* in nature [1].

One solution is to develop architectures that allow easy integration of the existing and new enterprise applications. However, the integration solutions are often proprietary which present issues of inoperability because of vendor lock-ins, tight coupling, complexity of services and issues of connectivity [2].

The Web Services (WS) technology and Service Oriented Architecture (SOA) offer better opportunities for enterprise application integration (EAI) with the added benefits of reduced costs, easier maintenance, greater flexibility and improved scalability. SOA, with its loosely coupled nature, allows enterprises to plug in new services or upgrade existing services [1] and provide opportunities to be able to respond *on demand*. It allows enterprises and their IT systems to be more agile to the changes in the business and environment.

In the rest of this paper, we first establish the need for SOA and mention the potential benefits that SOA aims to achieve. In sections III and IV, we outline the SOA framework and technologies and discuss the limitations and inherent issues. Section V presents suggestions for integration of enterprise applications and implementation of the SOA paradigm. In the last section, we present summary and conclusions.

## II. SOA AND ITS PROMISE

SOA is an emerging architectural style for developing and integrating enterprise applications. It is an organizational and technical framework to enable an enterprise to deliver self-describing and platform independent business functionality [3] providing a way of sharing business functions in a widespread and flexible manner. Knorr and Rist [4] define SOA as a broad, standalone and standards based framework in which services are built, deployed, managed and orchestrated in pursuit of an agile and resilient IT infrastructure. British Computer Society's definition suggests that *SOA is about the evolution of business processes, applications and services from today's legacy-ridden and silo-oriented systems to a world of federated businesses, accommodating rapid response to change, utilizing vast degrees of business automation* [5]. This architecture aims to provide enterprise solutions that can extend or change *on demand* as well as provide a mechanism for interfacing existing legacy applications regardless of their platform or language. It is being seen as a new approach to EAI to provide a closer alignment between a business and its IT systems.

SOA provides an opportunity to achieve broad-scale







