

Chapter 1.6

Web Services, Service–Oriented Computing, and Service–Oriented Architecture: Separating Hype from Reality

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ABSTRACT

Service-oriented architecture (SOA), Web services, and service-oriented computing (SOC) have become the buzz words of the day for many in the business world. It seems that virtually every company has implemented, is in the midst of implementing, or is seriously considering SOA projects, Web services projects, or service-oriented computing. A problem many organizations face when entering the SOA world is that there are nearly as many definitions of SOA as there are organizations adopting it. Further complicating the issue is an unclear picture of the value added from adopting the SOA or Web services paradigm. This article attempts to shed some light on the definition of SOA and the difficulties of assessing the value of SOA or Web services via return on

investment (ROI) or nontraditional approaches, examines the scant body of evidence empirical that exists on the topic of SOA, and highlights potential research directions in the area.

INTRODUCTION

Service-oriented architecture (SOA); Web services; mash-ups; Ajax; Web 2.0; some of their underlying middleware realization schemas such as SOAP (simple object access protocol), UDDI (universal description, discovery, and integration), XML (extensible markup language), and CORBA (common object request broker architecture); and many other ideas or approaches to cutting-edge information system architectures have become the buzzwords of the day for many in the business

world and also in the IT and IS communities. It is quite difficult, perhaps nearly impossible, to pick up any relatively current practitioner publication without encountering an article focusing on at least one of the above topics. A recent library database search using keywords *service-oriented architecture*, *Web services*, and *SOA* resulted in 800-plus returns. Further investigation revealed that roughly 25 of those 800 articles were sourced in research journals while the other (still roughly 800) articles were all from more practitioner-oriented sources.

When it comes to adopting and implementing SOA, it appears that businesses are doing it at astounding rates. Of course, what they are actually doing, even though they may say that their efforts represent a move toward service-oriented architecture, may not match anyone else's definition of SOA but their own. Furthermore, how can SOA be defined, and how can we define the benefits of moving toward such architectures? It seems that there is little agreement among practitioners and researchers alike as to a standard definition of SOA.

Worse still, a growing number of practitioners are now beginning to question the business return of some of the approaches. For example, Dorman (2007), Havenstein (2006), Ricadela (2006), and Trembly (2007) indicate that there is doubt emerging as to the real value of SOA to adopting businesses and organizations. Perhaps the question of return on investment (ROI) should not be that surprising since it sometimes seems that each organization has its own definition of what SOA really is.

This article attempts to reach for a clearer understanding of what SOA really is, and proposes some possible areas of research into SOA that could help clear up some of the definitional confusion, which could in turn help lead to better understanding of ROI as it relates to SOA. First is the introduction. Second, the article provides existing definitions of SOA, Web services, and some of the related and underlying technologies

and protocols. The next section combines the various definitions of SOA into a more coherent form, while the section after that proposes ideas about what SOA should be. The fifth section discusses research possibilities and provides recommendations for future research efforts. Next, we look at ways of measuring and justifying SOA and SOC (service-oriented computing) success. Finally, we conclude the article.

BACKGROUND AND HISTORY OF SERVICE-ORIENTED ARCHITECTURE

A minimum of nine formal definitions of SOA exist as of this writing, from sources such as the Organization for the Advancement of Structured Information Standards (OASIS), the Open Group, XML.com, Javaworld.com, Object Management Group (OMG), the World Wide Web Consortium (W3C), Webopedia, TechEncyclopedia, WhatIs.com, and Webopedia.org. In addition, many other definitions put forth by numerous industry experts, such as those from IBM, further cloud the issue, and worse yet, other formal definitions might also exist. In other words, the concept of service-oriented architecture appears in many ways to be a virtually content-free description of an IT-based architecture. It is not our intent here to add yet another definition to this already crowded arena of definitions, but to try to cull the common, base meanings from the various distinct definitions.

Prior to about 2003, the term service-oriented architecture was not in general use for the most part, according to Wikipedia ("SOA," 2007). However, since that time, SOA has exploded nearly everywhere in the business and technology world. SOA appears to derive or develop in many cases from more basic Web services. These services can include enabling technologies such as SOAP, CORBA, EJB (Enterprise Java Beans), DCOM (distributed component object model), and even

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