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服务计算

Services Computing

Liang-Jie Zhang
Jia Zhang
Hong Cai

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内 容 简 介

作为现代服务科学的奠基石，服务计算已成为一项桥接商业服务与信息技术服务的跨学科的科学技术。本书提出了对现代服务业进行创新研究的独到见解，系统展现了服务计算领域的创新型研究成果与解决问题的方法，如以服务为导向的架构、商业咨询方法与工具、商业流程建模、转型、集成与管理等方面的创新型研究成果等。揭示了如何利用信息服务与计算技术来有效地创建、营运与管理商业服务，介绍了服务创新研究中的一些主要解决方案架构、支撑技术和创新型研究方法。书中展示的服务创新研究的生命周期包括商业分解、服务建模、服务创建、服务实现、服务诠释、服务部署、服务搜索、服务组合、服务提供、服务合作、服务监测、服务优化以及服务管理。

本书的第一作者为全球服务计算学科的创始人和领导者,因此本书具有很高的权威性及参考价值。读者可从本书了解服务计算在 SOA 与 Web 服务方面的研究方向，从而有效地创建、营运与管理商业服务。本书可作为高等院校计算机科学与工程、信息技术、电子商务、工业工程、自动化、商业管理等专业的专业参考书，同时也是科研机构及信息技术公司的从业人员必备参考。

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Preface

Services Computing has become a cross-discipline subject that covers the science and technology of bridging the gap between Business Services and IT Services. Its most recent enabling technology is Web services centered on Service-Oriented Architecture (SOA). This book depicts an overall picture of the state-of-the-art of the field. A comprehensive set of innovative research results and solution methods is described and discussed, including business componentization, services modeling, services creation, services realization, services annotation, services deployment, services discovery, services composition, services delivery, service-to-service collaboration, services monitoring, services optimization, services management, business consulting methodology and utilities, business process modeling, transformation, integration, and management.

What Is the Uniqueness of This Book?

This book introduces innovative ideas and solutions based on existing key techniques and industry standards in the field of Services Computing. In particular, this book illustrates Services Computing as an emerging interdisciplinary science and engineering subject bridging the gap between business/application services and IT services. It presents a lifecycle view of modern services industry, discusses up-to-date innovative research directions and industry solutions in the domain of Services Computing. It explains how to effectively and efficiently establish, operate, and manage business and application services using Services Computing, and it also guides research directions of Services Computing.

There have been numerous publications in the market regarding Web services and Service-Oriented Architecture from specifications and standards perspectives. To our knowledge, however, this book is the first that provides a systematic view of SOA solutions and SOA services to enable the lifecycle of modernized services businesses and applications. In our view, Services Computing is not merely a technical direction;

instead, it is an interdisciplinary area aiming to bridge the gap between IT and business. Therefore, it is not only necessary, but also critical to consider Services Computing from strategic point of view. Moreover, Service-Oriented Computing is just a pure technology fraction of Services Computing that also includes services consulting methodologies, services design and service delivery, as well as services maintenance and management.

As for implementation, there have emerged a number of industry standards and specifications for Web services, such as Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), Universal Description, Discovery, and Integration (UDDI), Business Process Execution Language for Web Services (BPEL4WS). However, from our point of view, these existing specifications are just examples of infrastructure enabling technologies for Services Computing environment. With the development of Services Computing, these specifications and technologies will continuously be evolving into their next generation or be replaced by new technologies and standards.

Throughout this book, instead of repeating the existing specifications, we concentrate on introducing innovative frameworks and methods on how to leverage related technologies to address real business challenges. The existing technologies are used as examples to study the state-of-the-art of the field and can be used as starting points for further innovations. Along with the newly introduced ideas in this book, the present enabling technologies provide a comprehensive framework that can be used to construct domain-specific SOA solutions. It should be noted that the existing technologies may have to be adjusted, extended, and customized in accordance with particular execution contexts and business requirements.

Finally, this is a foresighted book intended to spur researchers, practitioners, and students into further explorations and investigations in the field of Services Computing. As SOA and services engineering become mainstream, there are numerous efforts underway in both academia and industry, all of which deliver concepts and technologies in the same or similar fashion. This book aims to guide readers to grasp the foundations and state-of-the-art developments in the field of Services Computing.

Who Should Read This Book?

Researchers and students

The audience first includes researchers, graduate students, and senior undergraduates who seek a systemic introduction to the key technologies and research innovations in the field of Services Computing. This book can be used as an introductory textbook, advanced undergraduate textbook, graduate textbook, continuing education textbook (e.g., for executive MBA), or supplemental reading materials in classrooms.

In addition, this book can be used as a reference book on advanced technologies for a set of existing courses such as Modern Software Engineering, Web Engineering,

Web Technologies, Advanced Software Engineering Methodologies, Advanced Software Architecture, and so on. Targeting departments include Department of Computer Science, Department of Industrial Engineering, Department of Business Management, Department of Automation, and Department of Management of Information System.

This book is organized in a way that is suitable for students to learn the Services Computing concepts and technologies step by step. It is written in a way that it can be used as a classroom textbook, as well as a self-study reference book.

Engineers and managers

As Services Computing is being widely accepted by the business world, practitioners who are interested in building value-added services or solutions based on SOA will become suitable audiences. Companies that either develop software using SOA or intend to introduce SOA and Web services in business could use this book as a reference book for their software engineers, IT managers, business managers, salesmen, and IT and business executives.

Outline of This Book

Part 1: Foundations of Services Computing

This part introduces core techniques of Web services modeling, registry, and discovery. SOA paradigm is discussed, along with SOA solution architecture based on industry best practices. Current SOA and Web services standard stack is also presented. Advanced techniques are introduced including multi-dimensional services modeling, dynamic services invocation, federated services discovery, services relationship modeling, and solution-level Quality of Service (QoS) in SOA.

Part 2: Realization of Services Computing

This part introduces services realization technologies from four perspectives: requirements-driven services composition, services value chain collaboration, business process management and integration, as well as business grid.

Part 3: Services Delivery and Services Engineering

This part introduces technologies and methodologies for services delivery and engineering from four perspectives: project-based business performance management, service-oriented business consulting methodology, end-to-end services delivery

platform and methodology, as well as software as services and services as software.

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