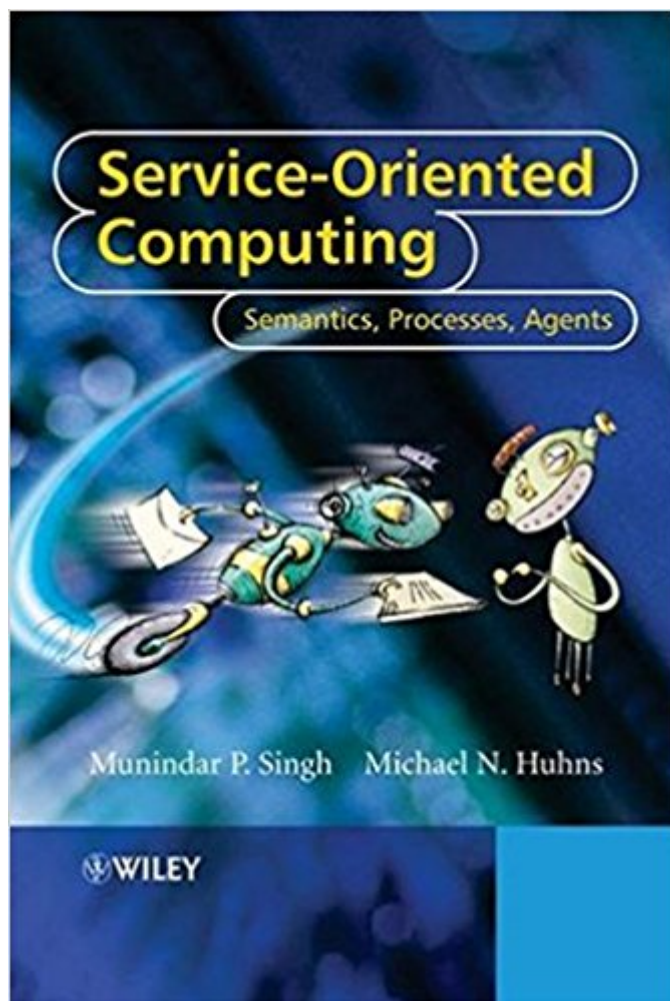


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# Service-Oriented Computing: Semantics, Processes, Agents



## Synopsis

This comprehensive text explains the principles and practice of Web services and relates all concepts to practical examples and emerging standards. Its discussions include: Ontologies Semantic web technologies Peer-to-peer service discovery Service selection Web structure and link analysis Distributed transactions Process modelling Consistency management. The application of these technologies is clearly explained within the context of planning, negotiation, contracts, compliance, privacy, and network policies. The presentation of the intellectual underpinnings of Web services draws from several key disciplines such as databases, distributed computing, artificial intelligence, and multi-agent systems for techniques and formalisms. Ideas from these disciplines are united in the context of Web services and service-based applications. Featuring an accompanying website and teacher's manual that includes a complete set of transparencies for lectures, copies of open-source software for exercises and working implementations, and resources to conduct course projects, this book makes an excellent graduate textbook. It will also prove an invaluable reference and training tool for practitioners.

## Book Information

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## Customer Reviews

Learn how to build more effective distributed applications with Web services! Service-Oriented Computing explains the principles and practice of successful services, with many of its concepts

developed in the context of Web services. Since every aspect of a service is geared towards compatibility – so they can be described, selected, engaged, evaluated, and collaborated with – Web services allow a more effective development of distributed applications than previous software approaches. Service-Oriented Computing presents the concepts, architectures, techniques, and infrastructure necessary for employing services. It provides a comprehensive overview of the state-of-the-art in Web services and associated disciplines, relating concepts to practical examples and emerging standards. Applications of technologies are explained within the context of planning, negotiation, contracts, compliance, privacy, and network policies.

**Service-Oriented Computing:** Draws from several key disciplines such as databases, distributed computing, artificial intelligence, and multiagent systems. Covers basic standards and protocols (XML, SOAP, WSDL, .NET, J2EE) in-depth. Describes advanced concepts such as ontologies, Semantic Web technologies, distributed transactions, process modeling, consistency management, organization, business protocols, peer-to-peer service discovery, and service selection. Contains a detailed section on the web ontology language (OWL) as well as business process languages (WSC1, BPEL4WS, BPML, and ebXML). Features an accompanying website with a complete set of transparencies, solutions to exercises, and open-source and public-domain tools for you to build and experiment with your own service-oriented computing systems. This invaluable reference will serve as a comprehensive senior undergraduate and postgraduate student textbook on service-oriented computing, enabling practitioners, technologists, strategists, and researchers to be adequately prepared for the fast-approaching explosion in Web service provision.

Munindar P. Singh is a Professor of computer Science at North Carolina State University. From 1989 through 1995, he was with the Microelectronics and Computer Technology Corporation (better known as MCC). His research interests include multiagent systems and Web services. He focuses on applications in e-commerce and personal technologies. Munindar's 1994 book *Multiagent Systems*, was published by Springer-Verlag. He coedited *Readings in Agents*, which was published by Morgan Kaufman in 1988. He has coedited several other books and authored several technical articles. Munindar's research has been recognized with awards and sponsorship from the National Science Foundation, DARPA, IBM, Cisco Systems, and Ericsson. Munindar was the editor-in-chief of *IEEE Internet Computing* from 1990 to 2002 and continues to serve on its editorial board. He is a member of the editorial boards of the *Journal of Autonomous Agents and Multiagent Systems* and the *Journal of Web Semantics*. He serves on the steering committee for the *IEEE Transactions on Mobile Computing*. Munindar received a B.Tech. in computer science and

engineering from the Indian Institute of Technology, New Delhi, in 1986. He obtained a PhD in computer science from the University of Texas at Austin in 1993. Michael N. Huhns is the NCR Professor of Computer Science and Engineering at the University of South Carolina, where he also directs the Center for information Technology. Previously he was a Senior Member of the Research Division at the Microelectronics and Computer Technology Corporation. Prior to joining MCC in 1985, he was an Associate Professor of Electrical and Computer Engineering at the University of South Carolina, where he also directed the Center for Machine Intelligence. Mike is a member of Sigma Xi, Tau, Beta Pi, Eta Kappa Nu, ACM, IEEE, and AAAI. He is the author of over 180 technical papers in machine intelligence and an editor of the books Distributed Artificial Intelligence, Volumes I and II, and, with Munindar, Readings in Agents. His research interest are in the areas of multiagent systems, enterprise modeling and integration, and software engineering. From 1997 to 2003, he wrote a column Agents on the Web for IEEE Internet Computing. Mike was an associate editor for IEEE Expert and the ACM Transactions on Information Systems. he is an associate editor for the Journal of Autonomous Agents and Multiagent Systems. He is on the Editorial Boards of the International Journal on Intelligent and Cooperative Information Systems, the Journal of Intelligent Manufacturing, and IEEE Internet Computing. He was an advisor for the First International Conference on Multiagent Systems, 1995, and has been on the advisory boards for the International Workshops on Distributed Artificial Intelligence. He is a member of the board for the International Foundation for Multiagent Systems and the International Foundation on Cooperative Information Systems. Mike received the BSEE degree in 1969 from the University of Michigan Ann Arbor, and the MS and PhD degrees in electrical engineering in 1971 and 1975, respectively, from the University of Southern California, Los Angeles.

This book is an extensive and scholarly work covering the full scope of service oriented architectures and computing. It begins with a thorough review of the technology involved and then works through the challenges and application of this emerging paradigm. Be warned - this is not "Semantic Web for Dummies". This is a serious book for people who need to go beyond the basics. As a researcher in software agent technologies, this book has helped me to better understand the issues involved in creating service based solutions. This book is useful as both a reference and as study in these exciting and emerging technologies that will be essential for anyone involved in creating the next phase of internet computing.

The book certainly has ambitious scope. It is essentially trying to devise what Tim Berners-Lee has

famously called the Semantic Web. The means is by the implementation of service oriented computing. Not surprisingly, the book spends a lot of necessary space on explaining the various Web Services standards that underpin Service Oriented Architecture. Like ebXML and Business Process (Execution) Language. The book does this with commendable rigour. That is the easy part. Far harder is where the authors delve into the fuzzier subjects of modelling and ontology. Thus we go into the Resource Description Framework and OWL. While we are shown the potential power of these, the text also points out that OWL has limitations, as in how it does not allow for constraint reasoning. But more generally, there will be different ontologies used by different groups on the Internet. With expected inconsistencies. Which gives problems to such goals as more intelligent searching by the various search engines. All these are very difficult issues that touch on the heart of artificial intelligence. It is unclear whether SOC will see us through this morass.

I really think the book achieves the purpose that the authors intended. I am actually taking a graduate course centered on service oriented computing taught by one of the authors Dr. Singh. While I have not read the entire text in length (And who of us end up reading a full tech book anyway) I think I can safely say that for the first edition of the text the authors have done a super job. Personally I think the text attempts and does a pretty good job of providing at least more than a basic level of understanding and comfort with service oriented computing. The authors note that an effective understanding of SOC (or anything in my opinion) can not come from studying the underlining standards alone. Justification points to the ever increasing abstraction of technology. This unique approach to learning a technical subject is quite different and unique from what I have been used to. I think the text really offers a different viewpoint of the subject. I gave the book 5 stars because of that reason. This might not be the only book I would recommend for learning web services but in technology, diversity can go a long way.

A lot of the information in this book is self-explanatory, and the tougher aspects (OWL, RDF) not nearly enough information was put in. The expanded sections on logic with time as a parameter was interesting, as well as the transaction protocols, but after a while it was like beating a dead horse and it seemed there was distinct lack of meat to the book. I would have preferred he expanded on the abstract theory and transactional logic in a more rigorous sense and would have spent much less time on the more common sense factors in Service Oriented Computing. That being said, this is the programming model of web programming, and any CS or IS person would be well suited to learn it.

We are using this book for a graduate course, and I've now read 11 chapters thus far. The book reminds me of a compilation of several academic papers (and that's not a compliment). I find that almost all the information in this book I can find on the web for free and explained better. Further, the authors have very little skill in explaining concepts and providing understandable examples for their audience. Our professor has to supplement this book with hand-outs just so the class can understand better. This book may be good for other academic stiffers versed in SOC already, but it is terrible for experienced computer scientists looking to enter the subject.

Browsing at local bookshop suggests that there is a lot of excellent, albeit soon to be outdated content in this text but unfortunately given the rapid turnover of knowledge in this frantically evolving domain, no book is worth US\$100 [hence the 3.5 star rating]. Pity that the publishers did not recognise the large potential for selling this book at a realistic price. I will settle for suggesting it for purchase by my University library and wait for some cheaper used copies. I cannot recommend it for student use for same reason

The authors cover a myriad of standards that support web services. The text and associated website provide useful examples. The bibliography is extensive and shows the amount of research that went into developing this extremely helpful text. I would recommend the book for technologists as well as instructors.

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