# Table of Contents

**Foreword** by Wil van der Aalst ........................................................................................................... xxv

**Foreword** by Cesare Pautasso ............................................................................................................ xxvii

**Preface** ............................................................................................................................................... xxix

**Acknowledgment** ............................................................................................................................. xxxvii

**Volume I**

## Section 1

**Dynamic and Adaptive Architectures for Service-Driven Computing**

**Chapter 1**  
Service-Driven Computing: Challenges and Trends ................................................................. 1  
*Raja Ramanathan, Independent Researcher, USA*

**Chapter 2**  
Dynamically Reconfigurable Architectures: An Evaluation of Approaches for Preventing Architectural Violations ................................................................. 26  
*Marek Rychly, Brno University of Technology, Czech Republic*

**Chapter 3**  
Distributed and Adaptive Business Process Execution: A Scalable and Performant Solution Architecture ............................................................................................................. 44  
*Michael Pantazoglou, National and Kapodistrian University of Athens, Greece*  
*George Athanasopoulos, National and Kapodistrian University of Athens, Greece*  
*Aphrodite Tsagatidou, National and Kapodistrian University of Athens, Greece*  
*Pigi Kouki, National and Kapodistrian University of Athens, Greece*

**Chapter 4**  
Dynamic Reconfiguration of Component-Based Systems: A Feature Reification Approach ........... 76  
*Tony Clark, Middlesex University, UK*  
*Balbir S. Barn, Middlesex University, UK*  
*Vinay Kulkarni, Tata Research Development and Design Centre, India*
Chapter 5
Rüdiger Pryss, University of Ulm, Germany
Steffen Musiol, University of Ulm, Germany
Manfred Reichert, University of Ulm, Germany

Chapter 6
Engineering Spatial Services: Concepts, Architecture, and Execution Models
Giovanna Di Marzo Serugendo, University of Geneva, Switzerland
José Luis Fernandez-Marquez, University of Geneva, Switzerland
Francesco Luca De Angelis, University of Geneva, Switzerland

Chapter 7
Dynamic Adaptation in Ubiquitous Services: A Conceptual Architecture
Moeiz Miraoui, University of Gafsa, Tunisia

Chapter 8
A Semantically Enabled Service Delivery Platform: An Architectural Overview
Ioan Toma, Semantic Technology Institute, University of Innsbruck, Austria
José María García, Semantic Technology Institute, University of Innsbruck, Austria
Iker Larizgoitia, Semantic Technology Institute, University of Innsbruck, Austria
Dieter Fensel, Semantic Technology Institute, University of Innsbruck, Austria

Chapter 9
Validating Autonomic Services: Challenges and Approaches
Tariq M. King, Ultimate Software Group, Inc., USA
Peter J. Clarke, Florida International University, USA
Mohammed Akour, North Dakota State University, USA
Annaji S. Ganti, Microsoft Corporation, USA

Chapter 10
A Service-Oriented Computing Platform: An Architecture Case Study
Michael Sobolewski, United States Air Force Research Laboratory, USA & Polish-Japanese Institute of Information Technology, Poland

Chapter 11
Dynamic Mashup of Media-Centric Services: Conceptual Model, Architecture, and Validation
Sang Woo Han, Agency for Defense Development, Korea
JongWon Kim, Gwangju Institute of Science and Technology, Korea

Chapter 12
Adaptive Web Service Composition: An Aspect-Oriented Approach
Areeg Samir, Cairo University, Egypt
Chapter 13
Discovering Services in Mobile Environments: Discussion and Evaluation of Trends ......................... 299
  Salma Bradai, University of Sfax, Tunisia
  Sofien Khemakhem, University of Sfax, Tunisia
  Mohamed Jmaiel, University of Sfax, Tunisia

Chapter 14
Automating Web Service Composition: An Ontological Agent Framework........................................ 330
  Tamer M. Al Mashat, Cairo University, Egypt
  Fatma A. El-Licy, Cairo University, Egypt
  Akram I. Salah, Cairo University, Egypt

Section 2
Integration in the Service-Driven Ecosystem

Chapter 15
Service-Driven Computing with APIs: Concepts, Frameworks, and Emerging Trends ......................... 355
  Hiranya Jayathilaka, University of California – Santa Barbara, USA
  Chandra Krintz, University of California – Santa Barbara, USA
  Rich Wolski, University of California – Santa Barbara, USA

Volume II

Chapter 16
Unifying Services and Resources: A Unified Architectural Style for Integrations............................... 380
  José C. Delgado, Instituto Superior Técnico, Universidade de Lisboa, Portugal

Chapter 17
Legacy Software Integration in Service-Driven Environments: An Intelligent Agent-Based Framework ........................................................................................................................................... 414
  Chung-Yeung Pang, Seveco AG, Switzerland

Chapter 18
Integrating Compliance Management in Service-Driven Computing: Conceptual Models and Automation Architecture ........................................................................................................................................... 439
  Natallia Kokash, Centrum Wiskunde and Informatica (CWI), The Netherlands

Chapter 19
Supporting Data-Intensive Analysis Processes: A Review of Enabling Technologies and Trends.... 481
  Lawrence Yao, University of New South Wales, Australia
  Fethi A. Rabhi, University of New South Wales, Australia
  Maurice Peat, University of Sydney, Australia

Chapter 20
Scientific Data Management and Visualization: A Service-Driven Integration Approach ............... 509
  Mariana Goranova, Technical University of Sofia, Bulgaria
Chapter 21
Mitigating Security Risks in Web Service Invocations: Contract-Based Approaches ........................................ 537
Gabriele Costa, University of Genova, Italy
Roberto Mandati, Institute of Informatics and Telematics of CNR, Italy
Fabio Martinelli, Institute of Informatics and Telematics of CNR, Italy
Ilaria Matteucci, Institute of Informatics and Telematics of CNR, Italy
Artsiom Yautsiukhin, Institute of Informatics and Telematics of CNR, Italy

Section 3
Service-Driven Computing in the Cloud

Chapter 22
Enterprise Cloud Adoption: A Quantitative Exploratory Research ............................................................. 554
Omondi John Opala, Devry University, USA & Cisco Systems, USA
Shawon S. M. Rahman, University of Hawaii-Hilo, USA & King Saud University, Saudi Arabia
Abdulhameed A. Alelaiwi, King Saud University, Saudi Arabia

Chapter 23
Resource Provisioning in the Cloud: An Exploration of Challenges and Research Trends .................. 589
Ming Mao, University of Virginia, USA
Marty Humphrey, University of Virginia, USA

Chapter 24
Cloud Service Brokerage: A Conceptual Ontology-Based Service Description Framework ............. 613
Frank Fowley, Dublin City University, Ireland
Claus Pahl, Dublin City University, Ireland
Li Zhang, Northeastern University at Shenyang, China

Chapter 25
Mitigating Technology Obsolescence in Cloud Software Services: A Model-Driven Approach ...... 640
Ritu Sharma, Himachal Pradesh University, India
Manu Sood, Himachal Pradesh University, India

Chapter 26
Building Elastic Java Application Services Seamlessly in the Cloud: A Middleware Framework .... 661
Rostyslav Zabolotnyi, Vienna University of Technology, Austria
Philipp Leitner, University of Zurich, Switzerland
Schahram Dustdar, Vienna University of Technology, Austria

Chapter 27
Integrating Business Intelligence Services in the Cloud: A Conceptual Model .................................... 686
Volker Herwig, University for Applied Sciences at Erfurt, Germany
Kristof Friess, University for Applied Sciences at Erfurt, Germany
Chapter 28
Admission Control in the Cloud: Algorithms for SLA-Based Service Model ................................. 701
  Jose Luis Vazquez-Poletti, Universidad Complutense de Madrid, Spain
  Rafael Moreno-Vozmediano, Universidad Complutense de Madrid, Spain
  Ignacio M. Llorente, Universidad Complutense de Madrid, Spain

Chapter 29
Reliability Modeling and Assessment for Open Source Cloud Software: A Stochastic Approach .... 718
  Yoshinobu Tamura, Yamaguchi University, Japan
  Shigeru Yamada, Tottori University, Japan

Glossary ........................................................................................................................................... xxxviii

Compilation of References .............................................................................................................. lii

About the Contributors .................................................................................................................. cxix

Index ............................................................................................................................................ cxxxiii