

Preface

Cloud computing has become a great solution for providing a flexible, on-demand, and dynamically scalable computing infrastructure for many applications. Cloud computing also presents a significant technology trends, and it is already obvious that it is reshaping information technology processes and the IT marketplace.

This Handbook is a carefully edited book – contributors are 65 worldwide experts in the field of cloud computing and their applications. The Handbook Advisory Board, comprised of nine researchers and practitioners from academia and industry, helped in reshaping the Handbook and selecting the right topics and creative and knowledgeable contributors. The scope of the book includes leading-edge cloud computing technologies, systems, and architectures; cloud computing services; and a variety of cloud computing applications.

The Handbook comprises four parts, which consist of 26 chapters. The first part on *Technologies and Systems* includes articles dealing with cloud computing technologies, storage and fault tolerant strategies in cloud computing, workflows, grid computing technologies, and the role of networks in cloud computing.

The second part on *Architectures* focuses on articles on several specific architectural concepts applied in cloud computing, including enterprise knowledge clouds, high-performance computing clouds, clouds with vertical load distribution, and peer-to-peer based clouds.

The third part on *Services* consists of articles on various issues relating to cloud services, including types of services, service scalability, scientific services, and dynamic collaborative services.

The fourth part on *Applications* describes various cloud computing applications from enterprise knowledge clouds, scientific and statistical computing, scientific data management, to medical applications.

With the dramatic growth of cloud computing technologies, platforms and services, this Handbook can be the definitive resource for persons working in this field as researchers, scientists, programmers, engineers, and users. The book is intended for a wide variety of people including academicians, designers, developers, educators, engineers, practitioners, researchers, and graduate students. This book can also be beneficial for business managers, entrepreneurs, and investors. The book

can have a great potential to be adopted as a textbook in current and new courses on Cloud Computing.

The main features of this Handbook can be summarized as:

1. The Handbook describes and evaluates the current state-of-the-art in a new field of cloud computing.
2. It also presents current systems, services, and main players in this explosive field.
3. Contributors to the Handbook are the leading researchers from academia and practitioners from industry.

We would like to thank the authors for their contributions. Without their expertise and effort, this Handbook would never come to fruition. Springer editors and staff also deserve our sincere recognition for their support throughout the project.

Boca Raton, Florida

Borko Furht
Armando Escalante