Preface

What Is This Book About?

In the last three decades, the world economic landscape has changed at a fast pace shifting from manufacturing to the provision of services. In fact, the service sector is the strongest economic industry of most modern nations, and it is also rapidly becoming an important sector in developing countries. As a result, the interest on services has grown and has originated an emerging and much needed field coined service science.

But what is service science? In very simple terms it is the study of service systems and services. This new field of science started in 2004 as a movement towards making services a first-class discipline. Service systems are structures configured with people, technology, organizations, and information. Services are instances of service systems which typically cause a transformation of the state of an entity resulting from the contractual agreement between a service provider and a service customer.

The typical example of this progression towards services is the concept and model known as *software as a service* such as Google Mail and Microsoft Office 365. The software (product) does not shift anymore in ownership. The provider has ownership and is responsible for its maintenance, upgrades, and repair. The customer has access to the leased product available as a service and pays a fee for its use. Since the service sector is amazingly varied, many other examples exist from transportation and distribution services, utilities and city planning services, and banking and insurance services to computer, legal, and consulting services.

The study of service systems is multidisciplinary and interdisciplinary and draws on concepts, theories, methods, and tools from a number of existing areas such as innovation, design, computer science, information systems, operations research, marketing and business, and economics with the main objective of creating an integrated, coherent, and consistent body of knowledge.

Why Is This Textbook Necessary?

One key element of service systems is their nature, focusing not merely on one particular characteristic of a service but rather considering a system of interacting elements (parts) which include:

- People skills and competencies
- Organizational structures encompassing business models
- Technologies supporting mobile and electronic services
- Information, knowledge, and analytics to deliver intelligent services

Studying these basic elements and the principles that interconnect them provides a body of knowledge underlying service systems. Furthermore, understanding how service systems can be created, designed, analyzed, and commercialized is yet another challenge for service experts. Nonetheless, current approaches for studying service systems—at an academic and professional levels—vary from organization to organization. In practice, *informal*, *ad hoc*, and *disconnected* methods are often used. For example, it is not uncommon to find professionals creating their own languages, techniques, architectures, and graphical representations.

Thus, the integrated knowledge provided by this textbook is indispensable to foster a new wave of future professionals to think in a service-focused way with the right balance of competencies in computer science, engineering, and management.

Who Should Read This Textbook?

The concepts presented in this textbook are precious for organizations, practitioners, researchers, and students who need to move towards new, innovative business models that rely on services as a source of new opportunities for generating value and driving a higher customer experience. The material explored, while not exhaustive, enables to train T-shaped professionals who must have a deeply developed specialty area (e.g., business management or computer science) as well as a broad set of skills and capabilities in the field of services (e.g., service design and optimization).

The intended audience of this book is twofold. For researchers, teachers, and students who want to learn about this new emerging science, this textbook provides an overview of the core disciplines underlying the study of service systems. It is aimed at students of information systems, information technology, and business and economics. It also targets business and IT practitioners, especially those who are looking for better ways of innovating, designing, modeling, analyzing, and optimizing service systems.

Book Content

This textbook is a centerpiece of a course syllabus on service systems. It provides a source of information and insights on a subject that was not properly covered by existing bibliography. It brings together in one place ten relevant subjects.

Chapter 1. Foundations What are services? Why are they becoming increasingly important for society? What is a service system? How are they structured? How do they contrast with goods?

Chapter 2. Electronic Services Which developments enabled the evolution of services into electronic services? What different types of electronic services exist? Which technologies are available for their implementation?

Chapter 3. Service Innovation What is service innovation? Which available methods support projects for new services development?

Chapter 4. Service Design How is service design related to service innovation? Which known methods and techniques are available to design services?

Chapter 5. Service Semantics How to enrich the description of electronic services with semantic knowledge? What are the benefits for service providers?

Chapter 6. Service Analytics How can the wealth of data generated by services be used for analysis? Which main tasks and methods are available?

Chapter 7. Service Optimization Which mathematical models can be used to solve planning problems arising in the area of services? Which tools can be used to assist engineers?

Chapter 8. Service Co-creation What is value co-creation, service encounters, service quality, and service productivity? Which methods can be used to manage them?

Chapter 9. Service Markets How can service systems be commercialized? Which methods enable the creation of competitive service markets? Which frameworks exist to model markets?

Chapter 10. Service Research What is the importance of recent research streams, such as service network analysis and service level engineering, for service systems? Why are service networks important for an interconnected world?

Each chapter includes a summary, a list of learning objectives, an opening case, and a review section with questions, a project description, a list of key terms, and a list of further reading bibliography. All these elements enable students to learn at a faster and more comfortable peace.

Suggested Course Structure

The guiding principle in writing this textbook was to make its content on service systems suitable for several contexts.

Service engineering This textbook is a central reference for a degree on service engineering since it brings under one umbrella several fields which contribute in one way or the other to the development of services with a superior quality.

Computer science will benefit from new insights from service innovation, design, semantics, analytics, and optimization to implement superiorly engineered electronic services such as Web or cloud services.

Industrial engineering will benefit from principles and methods to design services and approaches to analyze and optimize services.

Operations management can explore the fields of service design, service analytics, and service optimization for overseeing, controlling, and improving the process of production and redesign of services.

Service design naturally benefit from service innovation and service design but can also benefit from service co-creation and service markets to understand the synergies between all the stakeholders involved in service provisioning.

Marketing engineering can capitalize on service markets and co-creation chapters to understand organizational control systems such as sales force management systems and customer relationship management tools.

Table 1 shows how various degrees and courses benefit from the textbook.

Table 1 Coverage of the chapters (●, full; ◑, partial; ○, optional)

Course	Foundations (Ch 1)	Electronic services (Ch 2)	Innovation (Ch 3)	Design (Ch 4)	Semantics (Ch 5)	Analytics (Ch 6)	Optimization (Ch 7)	Co-creation (Ch 8)	Markets (Ch 9)	Research (Ch 10)
Service engineering	●	●	●	●	●	●	●	●	●	●
Computer science	●	●	◑	◑	●	●	●	○	○	●
Industrial engineering	●	●	◑	◑	○	●	●	◑	◑	●
Operations management	●	●	◑	◑	◑	●	●	●	●	●
Service design	●	●	●	●	○	◑	◑	●	●	○
Marketing engineering	●	●	◑	◑	○	○	○	●	●	○

Website Companion

This textbook has a companion website. It provides additional material to help lecturers use the text in their teaching and help students to deepen their understanding. The website is accessible at:

- http://www.fundamentals-of-service-systems.org

http://www.springer.com/978-3-319-23194-5

Fundamentals of Service Systems

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2015, XIX, 362 p. 138 illus., 118 illus. in color.,
Hardcover
ISBN: 978-3-319-23194-5