Preface

The importance of service has been focused on in various fields such as information and knowledge industries in the 21st century because the GDP in service sector of both advanced countries and developing countries has been increasing. Service science in the 21st century should cover not only traditional service industries but also servitization in manufacturing industries or new service businesses using new technologies. Against such a background, IBM proposed a new concept of “Service Science, Management, and Engineering” (SSME). Since then, service science has become a major research target in universities and industries all over the world.

Various new proposals have recently been actively proposed in service research, such as Service Dominant Logic (SDL) and “service as a theater.” These new concepts related to service are based on value co-creation between service providers and customers, which can be applied to all industries including important basic industries such as information or manufacturing industries, which aim at value creation for customers. How people who receive services recognize the service value is important and has been discussed. In addition, new service value creation can also lead to service innovation. According to such considerations, service is an activity that maximizes mutual value co-created through collaboration between providers and customers. Service science should support the maximization of service value by integrating various disciplines such as marketing theory, IT technology, system science, and human science. Service science is a new trans-disciplinary science and technology in the 21st century. In particular, knowledge science and system science are important from the viewpoint of maximizing service value.

There are many books related to service science and most of them have reported marketing or operations research. They seem to be conceptual and theoretical from the viewpoint of academic researchers. However, this book aims at new trends, new technologies, and new applications related to service science by taking into account these new trends, which are useful for practitioners who want to know about practical theories and successful examples. This book also deals with new methodologies to create customer values, which are useful real cases from the viewpoints of knowledge science and system science. Professional practitioners and researchers from universities have joined in writing this edited book. Therefore, the target audience of this book is composed of working professionals and scientific researchers working in the field of service science and service innovation.

This book describes new approaches to service innovation from the viewpoints of knowledge science and system science and consists of five sections. Section 1 describes new approaches and concepts for service innovation. Section 2 draws technologies related to knowledge science and system science for service innovation. Then, various applications in service science are described in Sections 3 to 5. Section 3 focuses on servitization in the manufacturing industry, Section 4 is related to service innovation in the information industry, and Section 5 deals with medical service science.
Section 1, which has new approaches and concepts for service innovation, consists of five chapters. In Chapter 1, Kosaka and Shirahada describe new definitions of service and new directions for service innovation, which is a general introduction to this edited book. The importance of knowledge science and system science is emphasized. In Chapter 2, Kosaka, Wang, Han, and Zhang propose a new concept of a service field for creating service values. This concept is analogous to the field theory in physics and corresponds to the “value in use” concept in Service Dominant Logic (SDL). This concept is quite challenging to create a mathematical model for service value. In Chapter 3, Nakamura proposes the modeling of service value creation based on a multidisciplinary framework. He focuses on visualizing the process of service value creation based on modern-service or knowledge-creation theory. In Chapter 4, Giraldo focuses on service encounters and describes them as important sites for service practices, potential service activities, and knowledge transformation. He indicates the significance of service encounters as contextually embedded spaces for potential services where resources are integrated and knowledge is co-created through service practices. In Chapter 5, Shirahada and Fisk discuss the sustainability of service and propose a new perspective of tripartite value co-creation to achieve this. Their proposal on the sustainability of service suggests that service providers collaborate with customers to not only improve their mutual values but also enhance the values of natural capital by establishing a voice for nature in service processes. This is a quite new future-oriented concept.

Technologies related to knowledge science and system science for service innovation are discussed in Section 2, which consists of seven chapters. In Chapter 6, Funabashi describes trans-disciplinary science and technology and re-organized system engineering methodologies for service systems. The re-organized systems engineering methodologies will guide us to a new systems science that is emerging (i.e., trans-disciplinary science and technology). In Chapter 7, Tu-Bao Ho, Taewijit, Quang-Bach Ho, and Dam discuss data science and service science. The concept of “Big Data” has recently become a hot issue in the information business. The relationship between “Big Data” and service science is very important for value co-creation in service science. In Chapter 8, Shirahada, Kosaka, and Maki focus on the potential of neural science in the marketing of services. They introduce two experiments by using an optical topography device based on Near-Infrared Spectroscopy (NIRS) technology and demonstrate the relationship between human cognition for specific propositions of service values and brain activities. They propose that the NIRS approach should be combined with various marketing methods such as persona marketing. In Chapter 9, Wang and Luo propose a new concept of a discrete service process and a sequential incident technique, which is employed to analyze the discrete service process of a well-known Chinese restaurant. It is shown that a revised Kano model is suitable to investigate customer satisfaction with the service process of the restaurant. In Chapter 10, Huynh, Doan, Kosaka, and Nakamori propose evidential reasoning based on an evaluation of services. The service evaluation problem can typically be regarded as multi-attribute decision-making, possibly with uncertainty. In Chapter 11, Pan, Wang, and Kosaka discuss the problem of matchmaking in service and customer demand. Dynamic service matchmaking is a process of matching the dynamic requirements of a customer to the service system’s functions to provide the most suitable service recommendations. They develop a model of dynamic requirements descriptions through ontology theory. In Chapter 12, Kawano proposes concepts for enhancing public infrastructures, which refer to smart grids and smart cities, and he discusses technical issues by focusing on systems technologies. He claims that the Autonomous Decentralized System (ADS) concept can be extended to information service systems.
Section 3 focuses on servitization in the manufacturing industry and consists of four chapters. In Chapter 13, Sumi and Kitatani describe trends and issues in service business innovation in the Japanese manufacturing industry. In addition, they report two successful case studies on an advanced service business such as a construction machinery and instrumentation company. In Chapter 14, Uchihira addresses a service design methodology for product-based services from the knowledge transfer viewpoint. He models the utilization of structured design cases as a knowledge transfer process and shows how it can contribute to the servitization of manufacturing. In Chapter 15, Belal, Shirahada, and Kosaka propose a knowledge space concept and a recursive approach for servitizing in the manufacturing industry. Their approaches can be applied to the value co-creation process with customers in “Business-to-Business to Consumer.” In Chapter 16, Kosaka, Yabutani, and Zhang propose a value co-creation model for the energy saving service business. “KIKI model” (Knowledge sharing related to the service system, Identification of the service field, Knowledge creation for the new service idea, and Implementation of the service idea) is demonstrated to be effective for service value co-creation in collaboration.

New approaches for service innovation in the information industry are discussed in Section 4, which consists of five chapters. In Chapter 17, Kohda discusses service innovation in the information business. Not only does he describe an actual case of servitization in the information industry, but he also explains the philosophy of servitization based on its background and principles. In Chapter 18, Kosaka, Nagaoka, and Doan propose a new value creation approach to the information business, where the service field concept is applied to the information business. This chapter discusses the usefulness of the “KIKI model” and issues with it for service innovation. The effectiveness of the service field concept is also emphasized in this chapter. In Chapter 19, Nishioka and Kosaka propose a new concept called a Methodological Universe for the Services Environment (MUSE) and a “Design Office.” Two successful cases of actual IT solution processes are analyzed from the viewpoint of services to demonstrate the effectiveness of the proposed concept. In Chapter 20, Konno discusses a service-oriented organizational management system for an information system business. The transformation from a GDL-oriented organizational management system to a Service-Dominant Logic (SDL)-oriented one is an important issue. He describes how a GDL-oriented organizational management system is transformed into one that is SDL-oriented by using the “value in use” concept. In Chapter 21, Kondo proposes a service design process and a value co-creation model for an Internet information service. A human-centered service design process for Internet information services is also discussed to improve the conventional service design process.

Medical service science is discussed in Section 5, which consists of two chapters. In Chapter 22, Ogawa, Ikeda, Suzuki, and Araki present a method of obtaining practical medical knowledge from medical experts toward supporting on-the-job training that is related to the quality of medical service implementations. In Chapter 23, Supnithi et al. propose a “self-management service framework” to support patients with chronic diseases through self-management. Information and Communication Technologies (ICTs) generally play a major role in self-management support systems. A successful case study project in Thailand to support diabetes patients through self-management is reported.

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