

## Chapter 2.5

# Transdisciplinary Approach to Service Design Based on Consumer's Value and Decision Making

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### ABSTRACT

Science and technology are expected to support actual service provision and to create new services to promote service industries' productivity. However, those problems might not be solved solely in a certain research area. This paper describes that it is necessary to establish transdisciplinary approaches to service design in consideration of consumers' values and decision making. Recent research trends of services are overviewed. Then a research framework is proposed to integrate

computer sciences, human sciences, and economic sciences. Three study examples of services are then presented. The first study is a multi-agent simulation of a cellular telephone market based on results of a psychological survey. The second presents a cognitive model constructed through integration of questionnaire data of a retail business and Bayesian network modeling. The third presents a pricing mechanism design for service facilities—movie theaters—using an economic experiment and agent-based simulation.

## INTRODUCTION

Recently, scientific studies of services have gained considerable attention from government, industry, and academia. The promotion of service productivity is a crucial issue in both developed and developing countries in response to changes in industrial structures and rapid globalization of business activities (Spohrer & Maglio, 2008). Many governments have initiated national projects for the promotion of service productivity and service innovation in the past several years. For example, the Japanese Ministry of Economy, Trade and Industry (Japanese Ministry, 2007) started a commission for academic–industrial cooperation in 2007 with a view to increasing service industry productivity. In Japan, a research center—the Center for Service Research—was established at the National Institute of Advanced Industrial Science and Technology in 2008 based on the discussion of that commission. Especially, in Japan, it has been noted that the growth rate of service industry productivity is lower than that of manufacturing industries. One reason for this phenomenon is that many existing services are thought to be provided less efficiently than manufactured products because actual service businesses include many human factors of service providers and consumers. Consequently, efficiency and optimization are salient issues addressed in recent studies of services. At the same time, it is necessary to elucidate how we can enhance the value of services in the market. From this viewpoint, human-related factors such as consumers' behaviors, cognition, value judgments, and social interactions are receiving greater attention for the improvement of actual services and design of new services. Nevertheless, those problems might not be solved through certain traditional disciplines such as engineering, psychology, and economics because they entail multiple aspects: technological, psychological, social, and economical aspects. Instead, science and technology are expected to support actual service provision by integrating some different research areas.

This paper advocates the importance of a transdisciplinary approach to service studies by presenting discussion related to the research trends in studies of services and by presenting some study examples of the authors. The subsequent section portrays an overview of research trends in service studies, particularly addressing academic fields and key technologies.

## RESEARCH TRENDS OF SERVICE STUDIES

Targets of service studies have varied over time. Using an academic database, the authors examined 150,000 articles describing studies of services, particularly addressing historical trends and key technologies (Takenaka & Ueda, 2008). Historically, studies of services are considered to have started with examinations of problems of public and social services. Until the 1970s, service studies were mostly undertaken in the fields of medical science, public administration, and library sciences. Public service infrastructure, for instance, was a main research topic during that period (Weinerman et al., 1965). In the 1980s, although displaying main concerns that were apparently the same as those of previous periods, discussions elemental technologies in the fields of telecommunications engineering gradually entered the relevant literature. During the 1990s, two changes of research targets occurred in service studies. Engineering (electrical, telecommunications, and computer sciences) rose to prominence among research fields related to service studies. That phenomenon corresponds with the worldwide adoption of the internet after 1996. Moreover, management science and management engineering assumed an important role in service studies. Those two important changes suggest that not only public or social services but also service businesses had become important research targets. After the late 1990s, growing interest is apparent in actual service processes,

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