Chapter 9
Service Science, Management and Engineering Education: A Unified Model for University

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ABSTRACT

Service Science, Management and Engineering (SSME) is an emerging discipline which studies service industry under an integrated framework. SSME education trains scientists and skilled service workers to promote innovation and productivity in service industry. Although quite a number of universities started SSME programs years ago, most of them are still in the stage of experiment, and only address a small portion of the total subject. This paper first discusses the objectives of SSME education program—the abilities that service workers and scientists should have. Then, three types of foundation courses of the current programs are discussed in depth; the bachelor, master and PhD degree programs offered currently are analyzed, which include the course contents and teaching methods. Based on the inspirations from these practical programs, a unified model for SSME education is developed and presented, which proposes to unify bachelor, master and PhD programs, and establishes a new service science department comprising areas of service management, service engineering and design, service arts and humanities.

INTRODUCTION

At present, the economies of many countries across the world are shifting toward more service-oriented economy than ever. In major industrialized countries, more than 75% of the employment and gross domestic products are already attributed to the service industry. Meanwhile, developing countries are also moving rapidly in this direction. For example, China's labor force in service sector has increased 191% in the past 25 years (Spohrer & Maglio, 2008). Service industry, especially knowledge intensive service, has become one of the most competitive and valuable parts of the

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economy in industrialized countries, as well as in developing countries in the near future.

However, the attention from governments, companies and universities toward service research, innovation and education is far from adequate (Bitner & Brown, 2008). Particularly, innovation in service is not regarded as highly as it is in agriculture and manufacturing, both of which have experienced large productivity and quality gains in the last two hundred years (Spohrer et al., 2007a). To improve this, IBM and others are trying to build a new discipline named "Services Sciences, Management and Engineering, SSME", which focuses on innovations of service, and hopes to bring together ongoing work in computer science, information technology (IT), operations research, industrial engineering, business, management, social and cognitive sciences, and legal sciences to develop the skills required in a services-led economy (Council on Competitiveness, 2004).

More specifically, SSME is the study of the evolution and design of service systems, with focus on the measurement and understanding of service productivity, quality, compliance, sustainability and innovation (Spohrer, 2006a). Service systems are rather complex systems, and innovation in service systems depends on more factors and need more complicated methods and tools than its counterpart in agriculture and manufacturing systems. Hence, we need to train and produce personnel who can master multiple methods and tools related to service, to achieve innovation and productivity in a service-led economy.

The problem is that the world's educational system has not shifted fast enough toward the rapidly changing service industry (Maglio, 2006). Most graduates coming out of universities and holding technical, scientific, or management jobs still possess only expertise that has little recognition of the service economy in which these graduates will live and work (Bitner & Brown, 2008). Only a limited number of service oriented graduates have been educated. Thus we need more innovation to break down the existing discipline silos, and to raise service oriented students to improve the performance of service systems.

One of such innovations is the attempt of SSME education program in universities. In fact, many universities over the world have started their programs in recent years. Hefley (2006) suggests that "inclusive" should be a principle of SSME curricula, i.e. current knowledge from multiple relevant disciplines should be included in a SSME curriculum. Industry cooperation is also important, and at least there are three forms of the cooperation between industry and university, including guest lectures, forum, and participating research in university (Gautschi & Ravichandran, 2006). Meanwhile, pioneers in universities begin to introduce their programs and experiences (Tien & Berg, 2006; Motta, 2008; Allen et al., 2008; Russell & Zobel, 2008), which have different emphases and directions. According to the research of Urban (2006), SSME program requires supports from university administrators; collaborations with industry, government funding, and understanding from students. In addition, proposals exist in the literature on developing a modular template-based SSME curriculum in higher education with possible extensions to other levels of education, and on exploration of new teaching methods in SSME (IFM & IBM, 2008).

In spite of the success of the current SSME programs, the study of SSME education is still in its early stage. A systematic and unified framework is urgently needed to guide the development of SSME education programs. The paper attempts to shed some insight on this issue.

This paper is structured as follows: Section 2 discusses objectives of SSME education. Section 3 compares different courses and programs provided in currently SSME education practices. Based on experiences learnt from the existing programs and shortcomings their have, a unified 3-layer model for SSME education is developed and presented in Section 4. The conclusions are in Section 5.