

Service Science: An Introduction

Matthew N. O. Sadiku, Adedamola Omotoso, Sarhan M. Musa

Roy G. Perry College of Engineering, Prairie View A&M University, Prairie View

ABSTRACT

Service may be regarded as the application of competences for the benefit of others.

Service science focuses on service as a system of interacting parts that include people, technology, and business. It is the study of services, service systems and value propositions. It integrates many service research areas and service disciplines. This paper is a brief introduction to the new field of service science.

KEYWORDS: *service science, service systems, service-oriented science*

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INTRODUCTION

A service is a process or experience that one person or organization does for the benefit of another. It may involve deployment of knowledge and skills offered by one party to another. It may be behavioral, intellectual, business, or spiritual. It may involve transport, water, education, e-mail, phone, medical service, banking service, etc. [1]. Service may be offered in exchange for their money, time, and effort. It depends on division of labor and effective co-creation of value. Global economies are shifting from agriculture and manufacturing to service-based economies and service industries now comprise more than 75% of the U.S. economy.

Modern services rely on technology and communication to create value by sharing skills and capabilities with others for mutual benefit. As service economies continue to expand and powerful digital communications networks – such as the Internet – evolve rapidly, there is a growing recognition in the industry that service innovation is now as important – if not more important than – technology innovation [2].

A CONCEPT OF SERVICE SCIENCE

A new concept has emerged, which is centered on IBM's "service science" (now abbreviated as SSME, for services sciences, management, and engineering). The concept dates back to 2002 as the result of the research collaboration between IBM's Almaden Research Center and UC Berkeley's Professor Henry Chesbrough [3].

Service science is a new area that combines organizational and human understanding with business and technological

understanding. It is clearly interdisciplinary because it draws on existing disciplines such as computer science, cognitive science, economics, web services, anthropology, organizational behavior, social science, mathematicians, marketing, operations, and industrial engineering. It stresses global economic developments such as globalization, competition, outsourcing, modularization, technology, communication, information, automation, and interdependence. Service-dominant logic and service systems will be fundamental to service science [4].

FOUR ELEMENTS

Service science generally involves four resources: people, technology, organization, and information [5]. People are studied in the social sciences and the humanities. Technology is taught in schools of engineering, technology, and computer science. Schools of business and management study organizations. Information is offered in schools of information science. This shows the cross-disciplinary nature of the new field.

The four parts of service science are [6]: atomic services, service composition, service scheduling, and standards. An atomic service is a service that cannot be further decomposed, i.e. it does not contain any subservices. A number of services can be put together to form a composite service using a matchmaking algorithm. Service scheduling involves selecting services, comparing them, and forming a reasonable, executable service sequence. A web service standard is used to describe physical properties such as number of inputs and outputs.

APPLICATIONS

Service science can be used to manage the big data information [7,8]. Big data applies to data sets of extreme size (e.g. exabytes, zettabytes) which are beyond the capability of the commonly used software tools. The characteristics of big data include volume, variety, velocity, and complexity of algorithms.

The service science approach can be used to support a web-based e-learning system.

Through e-learning, teaching and learning are conducted online via the Internet, thereby promoting learning anytime, anywhere [9].

Service science has also been applied in supply chain management. The last two decades have made supply chain management important in industry and academia. The global supply chain facilitates purchasing, operations, manufacturing, and logistics [10].

CONCLUSION

Although the idea of service science was born in the U.S., it is now spreading throughout the world and making global impact. Service science has been a strategic area of study at IBM Research. IBM Research is actively working with the world-wide research and academic communities to help define research directions for service science. It is important that companies and universities cooperate and construct a service science field that is relevant to the service sector. Some US universities plan to adopt service science as a program. These include MIT, UC Berkeley, Stanford, Rensselaer Polytechnic Institute (RPI), Arizona State University, and Northwestern. The goal is to provide professionals with a multidisciplinary education. They may offer courses and graduate-level certification in services and eventually establish degree programs at undergraduate, master, and doctoral levels.

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