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ANALYZING THE RELATIONSHIP BETWEEN SERVICE SCIENCE, SERVICE INNOVATION, AND SERVICE ECONOMY

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ABSTRACT

Based on service science and service innovation theory, this paper elaborates on the coupling relationship between innovation chain and industrial chain in the real industrial economy, and analyzes the internal reasons for the evolution of industries and the transformation of inter industry division of labor to intra industry division of labor. Analyzed the limitations of traditional economy and technological innovation, as well as the relationship between service activities and industrial value chains. Analyzed the relationship between service science, service innovation, and service economy, providing theoretical preparation for establishing a new type of service economy system.

KEYWORDS

Service Science, service innovation, industrial evolution.

Introduction

At present, service science and service innovation have become important concepts and popular terms in contemporary society. Although they are still in the conceptual research stage as emerging theories and have not yet formed a complete theoretical system, their emergence is in line with the development of the times and therefore has broad development prospects.

Service science was first proposed by IBM in May 2004, with the aim of promoting the application and transformation of technology into the service sector to help businesses, governments, and other organizations improve their current services. At present, academic discourse on service science can be divided into two categories: broad and narrow: broad service science refers to the exploration of modern services, namely service, science, management and engineering (SSME), which has a wide range of connotations and is therefore an emerging interdisciplinary field; Narrowly defined service science only refers to the scientific part of SSM E, which is a theoretical summary of service understanding, or advocates for enterprises to widely adopt IT, network technology and technological achievements, improve service performance, reduce service costs, enhance service efficiency, welcome and create new development opportunities, with strong commercial and practical characteristics.

At present, the academic discourse on service innovation is becoming increasingly widespread, becoming a new highlight in the development of innovation theory. Service innovation is a fairly broad concept that can be divided into two categories: broad and narrow. Broadly speaking, service

innovation refers to all innovative behaviors and activities related to or aimed at services, involving the service industry, manufacturing industry, and other fields; Narrowly defined service innovation refers to innovative behaviors and activities that occur in the service industry. Since innovation is the driving force of industrial and economic development, service innovation, as an important way of innovation, also plays an important role in promoting the development of the national economy. With the development of modern service-oriented economy, the theoretical and practical significance of service innovation research is becoming increasingly significant.

The inherent connection and difference between service science and service innovation is an important topic of concern for people. It involves the construction of service theory system and has important enlightening and guiding significance for the construction of service economy system.

Research and Analysis

1.Analyzing the Relationship between Service Science and Service Innovation The relationship between service science and service innovation can be analyzed through specific examples in the real economy. In recent years, enterprises have made significant progress in IT applications, particularly in the creation of service oriented architecture (SOA). SOA refers to a service-oriented architecture model, which links or combines services through IT and network technology to adapt to market and social needs and complete specific business tasks. For SOA, technology is the means, and services are the ends. As defined by Service Architecture com, SOA is essentially a collection of services. Services communicate with each other, which may involve simple data transfer or coordination between two or more services for certain activities.

The construction of SOA encourages enterprises to develop or combine relevant technologies based on their own business, promoting the development of new service activities. On the other hand, it involves the combination of a series of service activities both inside and outside the enterprise in the entire development and composition process, expanding the service field. The prosperity of enterprise SOA has expanded IT and network technology, and directly promoted the development of software companies and the network industry. SOA promotes the expansion of service content and the improvement of service methods, which leads to changes in the production and service methods of providers, improves economic efficiency, and benefits users, consumers, and the general public. From the perspective of service science, SOA belongs to its research scope; From an innovative perspective, SOA is a typical service innovation model.

For service science, its surface meaning is to push modern information technology, network technology, etc. into the field of service activities to promote the development of services; Its basic idea is to use technology as a means and service as the core and purpose. Service science runs through the idea of introducing and applying technology to achieve innovation. This technology service architecture model has forward-looking guiding significance for strengthening the connection between manufacturing and service industries, expanding service functions, promoting service development, and spawning a potential large market. Service science has expanded the scope of services to include both the manufacturing sector, such as treating new business models, processes, and labor management methods as services, as well as the service sector. However, due to the framework of technological innovation, service science focuses more on issues related to management and technology, which differs from service innovation in terms of connotation and scope.

The focus of service innovation lies in promoting changes in the service sector, and its surface meaning refers to a mode of innovation, but not in terms of the form of innovation. Its connotation is not completely the same as technological innovation, organizational innovation, and market innovation. Broadly speaking, service innovation involves both material and non-material production fields. In the manufacturing industry, service innovation is either subordinate to technological innovation or operates independently. However, regardless of the type of innovation, it includes changes in service activities, changes in service activity sectors and their internal structures, as well as new competition and development vitality brought to the industry by service enhancement. In the field of service industry, service innovation enhances the vitality of industry competition and development, and is the source of the emergence of emerging service industries.

Based on the comparison of service science and service innovation, as well as the analysis of real-life examples, the relationship between the two has been summarized in Table 1.

Table 1 Service innovation

	Service activities involve areas	**Theoretical and practical significance**	**Differential comparisons between each other**
Service science	Manufacturing industry (involved in the manufacturing enterprises Department service links, service activities and and external Service contact of the department);	Service is an important form of human activities and an important source of social wealth. Service science takes technology as the means and service, promotes technology integration and transformation into service activities, extends industrial value chain, enhances service, and promotes the generation of new service industry.	Theoretical perspective: focusing on the combination of technology and service, emphasizing technology as the means and service as the purpose; focusing on the discussion of management and technology, enriching the connotation of service; service science runs through the innovative concept, and deepening the industrial connection between manufacturing industry and service industry.
Service science	Manufacturing industry (involved in the manufacturing enterprises Department service links, service activities and and external Service contact of the department); service	Service innovation is an important form and way of innovation, including not only the service industry but also the manufacturing industry, which is universal; service innovation mode includes technology innovation, service media innovation and service innovation; service innovation enriches the content of innovation theory, drives the development of service industry and extends the industrial value chain; service enhancement has a direct effect on improving service quality and economic efficiency.	Theoretical perspective: development impetus of service activities and change of production mode; focusing on economics, with relatively prominent theoretical guiding significance in the field of medium economy; breaking through the limitation of traditional technological innovation, enriching the scope of innovation, and extending the meaning of service category.

Although there are certain differences in content between service science and service innovation, both elevate services to the strategic position of the entire economic development, and their theoretical core is extremely similar or consistent. They are the theoretical crystallization of reflection and sublimation of traditional economic thinking. Neither agriculturalism nor mercantilism, nor Adam Smith's

economic theory, have placed service in an important position in economic development and do not believe that service is also a source of wealth creation. For example, Quesnay's heavy agricultural economics believed that economic organizations mainly focus on planting, extracting, transforming, establishing, and distributing goods, and his theory hardly mentions services; Adam Smith, the founder of traditional economics, only regarded material production as the source of wealth creation. In his book "The Wealth of Nations," he pointed out that there has never been and can never be a great country without a manufacturing industry. He first recognized service activities as non productive labor, that is, industries that do not directly create wealth. Both service science and service innovation have expanded the meaning of service. The IBM Tokyo Research Center points out that service refers to the interactive process of creating economic value between service providers and users, including not only the service industry as a tertiary industry, but also the service business within the manufacturing industry. Service science and service innovation break free from the constraints of the traditional economic framework that services are non productive labor, and regard services as an important industry for wealth creation as a region that brings new profits to enterprises.

The service scope of service science and service innovation, as well as the idea of combining technology and service, have broken through the limitations of traditional innovation theories. The founder of innovation theory, Schumpeter, referred to innovation mainly limited to the manufacturing industry. Although he believed that innovation is a complex process and emphasized that credit is the primary factor for new combinations, he only regarded the credit system as an external factor supporting entrepreneurial innovation; Moreover, Schumpeter focuses on innovation triggered by market demand, while neglecting the role of scientific and technological research in innovation. The theory of service science and service innovation extends the scope of innovation to the field of services, emphasizing the leading and transmitting role of modern technology in services, filling the gap in traditional innovation theory to a certain extent, refining, enriching, and enriching innovation theory. The expansion of service scope by service science and service innovation provides a theoretical basis for establishing the connection between manufacturing and service industries, and elucidating the mechanism of industrial evolution.

Although services have existed since the beginning of humanity, it is not until today that service science and innovation have elevated services to the fundamental position of human social development, which has a profound background in economic development.

1) The development of knowledge and technology, as well as their increasing dissemination, infiltration, and diffusion into various fields of society and economy, provide a technological and knowledge foundation for the development of the service industry.

2) Emerging industries are flourishing and mainly concentrated in the service sector; The service industry is rapidly becoming a technology and capital intensive industry, and has risen from an auxiliary implicit industry of the national economy to a pillar explicit industry, changing the economic structure and operation mode, and has become an important industry driving economic development.

3) The strong innovation and diffusion capabilities of high-tech manufacturing provide important means, media, and tools for the development of service activities and the service industry. For example, the information highway first emphasizes service, with the goal of meeting the various needs of various industries and households for information. The construction of communication networks is only one means to achieve this goal.

4) Social progress promotes the development of the economy along a humanized track. People no longer pursue the possession of material wealth value, but pursue its systematic and personalized use functions, and strive to maximize its satisfaction with human social needs.

5) Economic globalization has continuously improved the business environment, and enterprises are no longer isolated. The connections between enterprises are becoming increasingly close, and the service activities inside and outside enterprises are showing a cross coupling development trend.

Although there are differences in the theoretical perspectives of service science and service innovation, they are both based on a theoretical summary of real economic development and represent the latest progress made in economic development; They both belong to the two wings of service economy theory and will inevitably lead to the same goal, laying an important logical framework for the construction of service economy; They make up for the shortcomings of traditional economics, enrich the content of economic theory, and have important theoretical and practical significance.

2. The Relationship between Industrial Evolution and Service Innovation Innovation is the driving force of economic development, and it should be reflected in real economic life and economic statistics. However, this is not the case in reality. For example, the development and application of computers were one of the most important innovations in the 1970s and 1980s, but where are their economic benefits? Soro once pointed out that you can see the shadow of the computer age anywhere, but you cannot find its existence in productivity statistics.

On the one hand, this is due to the uncertainty and lag of innovation, which makes it difficult for current economic statistics to fully reflect the economic benefits of innovation. On the other hand, economic statistics and technology statistics (including innovation statistics) are basically two separate layers, and their connections are dispersed. At present, economic statistics focus on output (such as GDP, economic growth rate, total foreign trade, etc.) or fixed assets investment, ignoring changes in the technological basis of the production process; However, innovation statistics focus on the input perspective and do not reflect innovation output. There are multiple complex reasons for the separation of economic statistics and technological statistics. The core of traditional economic statistics is to reflect what is produced and its economic scale, without examining how it is produced, resulting in economic statistics abandoning the description of industrial technological foundations.

The intention of the technological innovation statistics created in the 1990s is to reflect the role of knowledge and technology in economic development and the transformation of industrial production methods from an economic perspective or to abandon the linear model of research and development (R&D) statistics. However, due to the lag and uncertainty of innovation, its statistics only describe the technology introduction and application in the innovation process from the perspective of the enterprise itself, ignoring the description of the service-oriented organization and the overall production structure changes of the enterprise, and failing to reflect the driving effect of knowledge and technology on production. The existing statistical model based on individual enterprises and then aggregating enterprise data is difficult to reflect the changes between industries and the economic system. The limitations of statistical models are also an important reason for the separation of economic statistics and technological statistics.

3. Limitations of lagging industrial classification system generally speaking, traditional economics and statistical analysis strictly delineate the boundaries between manufacturing and service industries, and the boundaries between them can be described as distinct. The overall theory of industrial

economics has a basic premise that the enterprise affiliation and industry boundaries of an industry are fixed and unchanging, and any enterprise always belongs to a specific industry, or does not consider the issue of changes in the enterprise's industrial attributes. However, the current industrial classification lags behind the industrial evolution of the real economy. Industrial classification is usually compiled every 10 years, or for a longer period of time. Even the North American industrial classification system only undergoes minor revisions every 5 years, which still cannot keep up with the speed of industrial evolution.

In modern economy, industrial relations are undergoing rapid changes. With the development of modern technology and economic globalization, the evolution and structural adjustment of industries are intensifying. The changes in economic development are all related to innovation. Innovation not only promotes economic development, but also plays an important role in the transformation of industrial production methods and industrial structure. This is mainly manifested in:

Some manufacturing enterprises have been transformed into service industry enterprises. Enterprises that originally belonged to the manufacturing industry have transformed into service industry enterprises through the extension of the industrial chain. For example, Nike, founded in 1964 for $500, is currently the world's largest sports shoe brand manufacturer. However, it has now shifted its production of sports shoes to developing countries such as China and Vietnam, without setting up production workshops in the United States. Instead, it specializes in the research, design, and sales of sports shoes, thus becoming a service industry enterprise; Dell Corporation is the same, transforming from a computer manufacturing enterprise to a service-oriented enterprise. These manufacturing enterprises have extended their industrial chain by enhancing their service links, and have achieved a transformation towards a service industry identity by transferring their original production links outward, rather than a doorstep transformation.

The emergence of a large number of emerging service industries has led to rapid growth in employment and output value, thereby changing the distribution pattern of the industry. For example, the added value of services in developed countries such as the United States accounts for over 70% of GDP, and the service industry has become a locomotive driving the economy. The manufacturing industry has nurtured service activity departments such as research and development, sales, design, and planning, which have become an important foundation for supporting enterprise innovation and development. Innovation America once pointed out that the boundary between manufacturing and services in modern economy is becoming increasingly blurred. Due to the information revolution, especially the software revolution, a large part of manufacturing is based on services.

Industrial division of labor has shifted from inter industry division to intra industry division, with many multinational companies occupying high-end positions in the global industrial value chain, winning the initiative in market competition and maximizing profits.

However, the lag in industrial classification cannot be reflected for a certain period of time. For example, in the second half of the 20th century, with the development and innovation of information and network technology, a large number of emerging industries emerged in the United States. However, the current statistics in the United States still rely on the original industry classification and do not reflect the relevant industry changes; It was not until 1997 that the United States made modifications to the 1992 version of NAICS, adding 358 new industry classifications (of which 250 belonged to the service industry), that the new industry classifications reflected the changes in

industrial structure. Compared to the old version of the industrial classification system, the new version of the industrial classification system reflects a lag of about a few years in the changes in industrial structure.

4.The basic ways of service innovation. There are various forms of service innovation, which are distributed in various industries of the national economy and can be statistically divided into three modes. Technology introduction model: Similarto manufacturing technology innovation, it refers to the innovation of introducing a certain new technology, new media, etc. into the service industry, which can promote the transformation of business models, such as SOA and e-commerce.

Service oriented model: A new service activity implemented in response to new market demands. This innovative form of service is also exploratory and can promote organizational structure changes or procedural development of enterprises, such as chain store operation.

Integrated service model: refers to a service activity that combines past service activities based on new enterprise development strategies or business models, such as promoting the integration of product production and services, and carrying out a series of service activities such as after-sales service and consulting service.

Just as there are differences in the extent of product innovation and process innovation in various industries, the above three forms of service innovation also have different focuses in the development of various service industries. For example, innovation in the high-tech service industry mainly takes the form of introducing and adopting high-tech to achieve business transformation. However, high-tech cannot replace services, but is used as a tool or means to achieve services; In the retail industry, service-oriented innovation forms are the main focus.

Conclusion

Firstly, the content in service science that focuses on services and combines technology with services has important reference significance for the framework design of service innovation statistics. That is, to appropriately supplement statistical content related to business strategy, business processes, personnel/labor, basic technology, and other aspects in service science in service innovation statistics.

Secondly, the discussion on the expansion of service connotation in service science has important reference significance for enriching the statistical content of service innovation. That is to say, in the statistics of service innovation, appropriate statistical content related to personnel and funds of auxiliary units and departments should be added, and quantitative descriptions of organizational innovation and market innovation should be added.

Thirdly, the discussion on the relationship between manufacturing and service industries in service science has important reference value for communicating industry statistics and innovation statistics. That is, innovation statistical analysis is linked with industrial structure analysis to reflect the role of industrial innovation.

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