

Research on Lifecycle Service Mode of Construction Enterprises Based on Niche Theory

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Abstract: As an important part of engineering construction, the whole life cycle service of construction enterprises can not only protect building energy efficiency, but also effectively guide the development of construction enterprises. In order to give full play to the guiding role of life cycle service, we should enrich the connotation of life cycle service and implement life cycle service management for construction enterprises. The evolution and change process of niche is the process of industrial development, and niche factor is the factor causing the change, which provides a good analysis method for analyzing the development of building energy-saving service industry and looking for the factors hindering the development of the industry. Based on niche theory, this paper puts forward the obstacles and Countermeasures of service-oriented transformation of construction enterprises, and further introduces the future trend of service-oriented business model of construction enterprises, in order to provide reference for the transformation and development of construction enterprises.

1. Introduction

Modern enterprises are undergoing a supply chain transformation, and they are changing from the traditional business model based on large-scale production to a new business model that provides integrated solutions for products and services. The process of creating new value for customers and enterprises by adding services is called "service" [1]. As an industry that consumes a lot of energy and is essential for human development, the service of the whole life cycle of enterprises has attracted more and more attention. The whole life cycle service of construction enterprises embodies the demand of friendly environment, is an important means to realize the sustainable development of construction enterprises, and is also the development trend of construction enterprises in the future. However, to vigorously promote the whole life cycle service of construction enterprises, we must consider its economy and give full play to the guiding role of the life cycle service of construction enterprises [2]. From the perspective of the whole industrial chain of "manufacturing+service", optimize the quality, benefit and internal structure of industrial economy, and promote the transformation from manufacturing to service-oriented manufacturing [3]. However, at present, the research and practice of service are mostly focused on manufacturing enterprises, but the service of construction enterprises is relatively backward. As an important part of engineering construction, the whole life cycle service of construction enterprises can not only escort building energy conservation,

but also effectively guide the development of construction enterprises. To give full play to the guiding role of life cycle service, we should enrich the connotation of life cycle service and implement full life cycle service management for construction enterprises [4]. At present, the academic research on the enterprise life cycle service model mainly studies how the government should formulate industrial support policies to support the life cycle service industry from the perspective of the life cycle service industry.

The evolution and change of niche is the process of industrial development, and niche factor is the factor that causes the change, which provides a good analysis method for analyzing the development of building energy-saving service industry and finding the factors that hinder the development of this industry [5]. Because of the particularity of construction enterprises, its service transformation mode is obviously different from that of manufacturing enterprises. Based on the characteristics of niche theory, this paper discusses the service mode of enterprise life cycle from the perspective of project life cycle [6]. Service-oriented mode in the whole life cycle of enterprises, like biological communities in nature, changes and grows in the process of material and energy exchange with the environment. The similarity between them creates feasibility for exploring the development of building energy-saving service industry by using niche theory.

2. Concept of niche theory

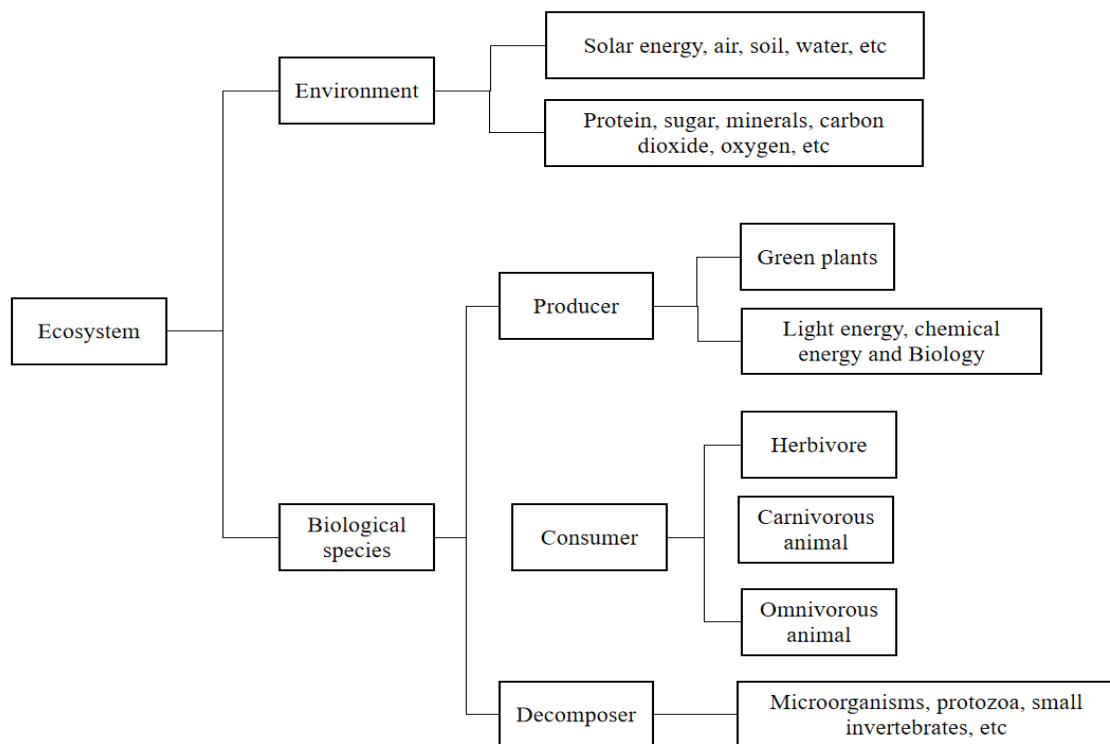


Figure 1: Niche composition map

The emergence of the word niche can be traced back to the 1930s. Tansley proposed that ecosystem is a complex composed of various organisms and their living environment. The relationship between them is inseparable. Organisms, communities and their living environment together constitute small systems in the natural world. Niche is a set of environmental conditions that can make the growth rate of population non negative [7]. Because the growth rate is usually expressed in many environmental dimensions, the relevant environment of the population constitutes an n-dimensional

space, and each dimension represents the level of some relevant environmental conditions, such as average rainfall or average temperature difference between day and night. Niche is a general term for the complex system composed of all environmental elements and organisms in the natural system [8]. It is a system formed by biological units and their corresponding environment in a certain period and range. There is a systematic material and energy transfer relationship between the components of the system, which has an interactive relationship and can carry out self-regulation. This process will also change with the change of environment to achieve ecosystem balance in fluctuation. Its composition is shown in Figure 1.

Niche system theory further discusses the concept of ecosystem and the complex relationship between objects, organisms and environment. In recent years, some new sub theories, such as key species theory, have been gradually applied to the study of socio-economic phenomena. From an ecological point of view, if the existence of one population affects the growth rate of other populations, there will be interaction between these two or more populations. This impact can be either positive or negative. Nowadays, the more common understanding of niche theory is that all ecological elements in ecological space have corresponding niche. Within the change range of ecological factors, the part that can be occupied, utilized or adapted by ecological elements is niche. For enterprises, niche refers to the collection of social, economic, political and other environmental conditions needed for enterprise growth. Whether an enterprise can grow continuously depends on its adaptability to niche. According to the system theory, ecological factors can be divided into several dimensions and gradients, that is, subsystems for analyzing research objectives. In each dimension, the change range of ecological factors is called basic niche, the part actually occupied, utilized or adapted by ecological elements is called realized niche, and the part potentially occupied, utilized or adapted is called potential niche.

3. Service mode and competitive advantage of construction enterprises in the whole life cycle based on Niche Theory

3.1 Service-oriented construction enterprises based on the life cycle of niche theory

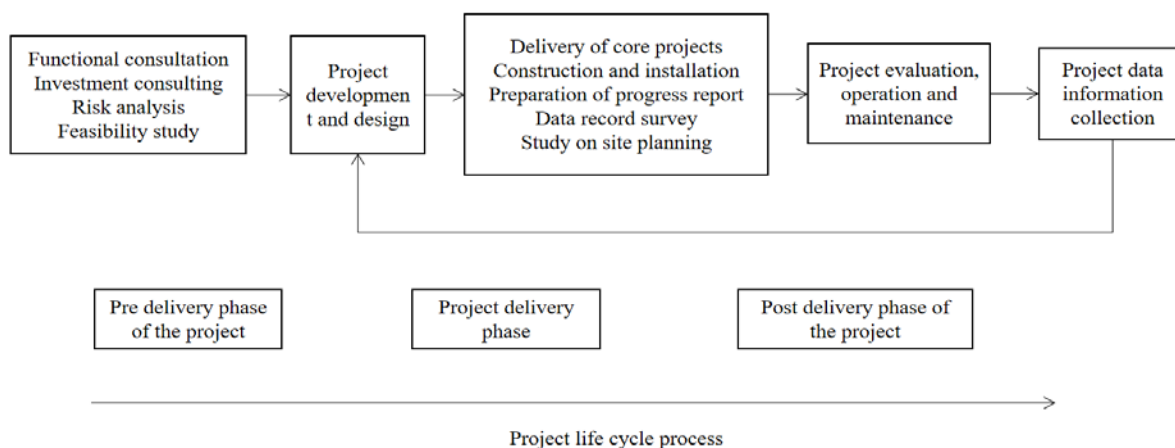


Figure 2: The architecture of life cycle service mode of construction enterprises

The service of construction enterprises must change the concept that the project value only focuses on the project delivery stage, and the project should be regarded as a process of the whole life cycle. Service oriented construction enterprises focus on what related services can be provided at each stage of the project life cycle, so as to ensure that customers can perceive value at each stage, as shown in Figure 2.

The pre delivery stage of the project is mainly to conduct preliminary investigation on the project, collect and sort out relevant data, formulate preliminary project feasibility study report, provide financing consultation, technical and economic evaluation and risk analysis, provide decision-making basis for decision-makers, and the feasibility analysis report helps to formulate reasonable project objectives and project plans, Project schedules help estimate more accurate project completion times. As an open system, once a building is completed and put into operation, it will interact with its environment until the end of the whole material life process. In terms of ecological design, the built environment can not be regarded as a static system, and it is considered that it will not interact with the surrounding ecological environment. General asset management refers to asset value management such as depreciation, investment or purchase of equipment. In fact, the enterprise asset management system also includes specific physical objects, operation status of equipment and facilities and the length of operation of spare parts.

3.2 Service brings competitive advantages to construction enterprises.

The competitive advantage brought by service to construction enterprises is related to the related services provided at each stage of the project. Value-added services such as investment consultation, consultation on project operation and operation methods, free pre-design, risk analysis and technical and economic evaluation provided to customers in the pre-delivery stage of the project can not only motivate customers to sign contracts, but also attract customers to pay attention to other businesses of the enterprise and become new potential users of other project businesses. Designers should realize from the perspective of energy and environment that the life cycle of buildings refers to the whole cycle process from the production of materials and components (including the exploitation of raw materials), planning and design, construction and transportation, operation and maintenance to dismantling and disposal (abandonment, recycling and reuse, etc.), that is, the whole life cycle of buildings. The consultation on the operation function and operation method of the project system and the research on economic profitability in the pre-delivery stage can increase customers' understanding of the project, thus enhancing the attraction of the project to customers. Ecological design requires a holistic and comprehensive way to manage the energy and material resources of building elements. Therefore, it is necessary to conceptually regard each completed system as a design system with its own life cycle mode. The personalized services provided by construction enterprises to customers can help enterprises obtain unique competitive advantages. The competitive advantages mainly come from the attractive services provided in the process of the project. Life cycle assessment is a systematic and quantitative assessment of the impact of a product on the environment in its life cycle. Technical, economic and risk assessment and consulting services before and after project delivery, as well as integrated management services in the whole life cycle stage, help to improve the economic benefits and management level of the project and promote the continuous optimization and improvement of the project business model.

4. Conclusions

The service of enterprises is still in the stage of exploration and development. At present, the business model of providing services before project delivery and ending with project delivery is still widely adopted by most construction enterprises. The development of the service mode in the whole life cycle of an enterprise is influenced by its own conditions and external environment, just like the growth of species and communities in the natural system. On the premise of meeting the different needs of customers, enterprises can gradually form different service modes from focusing on the stage of project independence to providing comprehensive management for the whole process of the project. Niche represents the ability of community to choose and adapt to environmental changes in a certain

environment, and depicts the process of its survival in the competition. In order to maintain the stable coexistence of the whole life cycle service mode of construction enterprises, their niche must maintain certain differences. The whole life cycle service mode of China's construction enterprises can adopt dislocation management strategy, value innovation strategy and collaborative evolution strategy to achieve sustainable growth.

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