An analytical framework for the evolution of innovation of niches in business ecosystems based on TRIZ

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Abstract

This paper proposed an analytical framework based on TRIZ to analyze the evolution of niche enterprises in business ecosystems and to develop its innovation tactics. We argued that the evolving demand caused the constantly inconsistency between demand and niche's supply, and the resolution of these conflicts push the niche enterprises to grow. According to this framework, the conflicts during the different stages of a niche life cycle can be handled by conflict matrix and innovation tactics can be given by using Inventive principle by using TRIZ. Lastly, the validity and feasibility of the framework was verified in Alipay.Com.

1. Introduction

In order to adapt to the complex and changeable competitive environment, firms tend to the development model of network, the business ecosystem gradually become the development trend of many firms. Niche is small and medium-sized firm dependent on the core firms in business ecosystems, which is numerous and has the strong ability of innovation. Niche's number and inventory rate are important robustness indexes of business ecosystems, however, as the fierce competition increasing, niche enterprises are hard to survive in the market competition because of the constraint factors: small size, less money and so on. CHINA HRKEY research center published The White Book On Small And Medium-sized Firm’s Human Resources Management In China (2012), which shows the average life for the small and medium-sized firm in our country is 2.5 years. Therefore, the research on the development evolution process of China’s niche enterprises has important practical significance and theoretical value to guide the growth of small and medium-sized firms and plan feasible development strategy.

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TRIZ theory, proposed by the former Soviet Union scientists, is the systematic methodology about inventing problems and solving problems. The theory argued that the sign of product innovation is resolving or removing the conflict in the design to get a new competitive solution. And the process of niche enterprises’ innovation and evolution in business ecosystem is same as the process: constantly solving the conflicts between supply and demand of firm, and the market demand faced by niche enterprises obeys the demand evolution law of TRIZ for all stages of niche enterprise’s life cycle. So we could use the law to define and analysis the characteristics of demand in each stage, and then use the resolution conflict theory of TRIZ to analyze conflict to get the innovation strategies.

2. Literature review

2.1. business ecosystem and niche firm

The concept of business ecosystem is firstly proposed by James F. Moore in 1993, and he also put forward The Seven Dimensional Analysis Framework (4P3S) in his paper[1]. Subsequently, Marco Iansiti[2] perfected the theory of business ecosystem, and through referencing concepts of biological, the "population" in the business ecosystem is divided into basic enterprise, leading enterprise and niche enterprise. In addition, The 6C Analysis Framework of business ecosystem based on the Internet of things is put forward by KeRong[3-4], and they discussed the platform strategy of the life cycle of business ecosystem in three aspects: technology, application and organization. In China, Yingying Wang[5] pointed out that the evolution of business ecosystem and conversion of the roles among enterprises are the macro performance and micro performance in the process, both are connected by the ecological niche and mutually promote. Linlin Liu[6] proposed that monomer firm which wants to build a competitive advantage must depend on the platform of business ecosystem. Jingjing Yin[7] studied the balance problems of niche enterprises between fast growth and stuck risk under different degrees of coupling based on the dependencies between niche enterprises and core firms. In addition, Guoshun Wang[8] constructed a growth evaluation system for niches, such as the health of business ecosystem, the macro environment of niches, financial situation, human resources, product (service) and market.

Generally, the existing literature provides a comprehensive framework for the study of the business ecosystem theory, niche firms and relationship of niches. Although some studies have explored the growth mechanism of niches, analysis angle is too macro to be translated into the development strategies of the firm. In this paper, we use the life cycle theory of firm and the law of demand evolution to analyze the law of innovation and evolution of niches. And the conflict resolution mechanism of TRIZ is introduced to analyze development strategies of each stage in the firm’s development process, this paper is more practical.

2.2. TRIZ theory

The concept of TRIZ theory was firstly proposed in the former Soviet Union by G.S.Altshuller who put forward a complete system of the theory of the solution of inventive problems[9] through analyzed over 400,000 patents. Later, the United States and other western scholars began to study TRIZ theory, and during this time, TRIZ was applied in the field of industrial technology. In China, the application of TRIZ is not only in the innovative design of products, but also in education, economic management, etc. In product innovation, Yang Gao[10] achieved rapid conversion between the design properties of green product and the engineering parameters of TRIZ based on the conflict matrix of TRIZ, and he also studied the innovative design of green products through the evolution theory of TRIZ. In economic management, Jianming Ji[11] filtered out 33 management parameters referring to the 39 engineering technical parameters of TRIZ, and constructed a general management conflict matrix.

In totally, TRIZ theory has been applied in different fields: technology, management and so on. In this paper, it is feasible to use TRIZ to analysis the process of innovation evolution mechanism of niches.

3. Conflict-response model of innovation evolution of niches

The growth of enterprises is the process that matching the supply and demand of the market. In this process, The conflict between supply of enterprise and demand of the market constantly emerges with the changing of market
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