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Study of the Game Theory Analysis and Incentive Mechanism of Inter-Organizational Knowledge Sharing in Cooperative R&D

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Abstract

With the technological development and social demand, an increasing number of multi-field complex products come into being and call for the research and development (R&D) of many enterprises. Since the R&D is related to a large amount of knowledge, it is of great significance to realize effective knowledge sharing and establish an incentive mechanism to promote the knowledge sharing. This study constructed an inter-organizational knowledge sharing model for cooperative R&D and a static inter-organizational knowledge sharing game theory model. Subsequently, it analyzed the decision matrix of cooperative organizations in detail. Finally, it proposed an incentive mechanism to realize knowledge sharing, which a feasible method for improving the effect of the inter-organizational knowledge sharing in cooperative R&D.

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1. Introduction

In the growth and competition processes of enterprises, knowledge has become a core asset of enterprises. Meanwhile, knowledge management is also treated as a major content and included in the strategic development. In particular, in the enterprises majorly developing and researching high-tech products, the whole R&D process is an intensive knowledge management process since it involves the inter-organizational design and manufacture of multiple fields. The inter-organizational knowledge sharing therein is a key link. Especially for some key technologies and design methods, the knowledge sharing is an important guarantee for the successful R&D of a product.

As for the cooperative organizations, knowledge sharing is a game process for measuring cost and pursuing individual benefit. Therefore, to guarantee the realization of high-qualified cooperative R&D, it is needed to analyze the inter-organizational cooperative R&D mode and knowledge sharing game theory model, and promote the implementation of knowledge sharing using effective and reasonable incentive mechanism. This study analyzed the game theory mode in inter-organizational knowledge sharing process and proposed the incentive mechanism for the inter-organizational knowledge sharing.

2. Research status

At present, the knowledge sharing has been repeatedly researched. Related researches mainly focus on the inter-organizational knowledge sharing and inter-organizational knowledge sharing.

C. L. Witherspoon[1] completed a meta-analysis and found knowledge sharer intention and attitude, rewards and organizational culture positively contribute to knowledge sharing intentions and behaviors. H. H. Chang[2] combined the theories of social capital and individual motivation to investigate the factors influencing knowledge sharing behavior in a virtual community, which found that altruism, identification, reciprocity, and shared language had a significant and positive effect on knowledge sharing. S. Gächter[3] used game theory to predict knowledge sharing behavior in private-collective innovation, and tested predictions in a laboratory setting. F. Wijnhoven[4] proposed a realistic game-theoretical model for analyzing knowledge sharing based on five assumptions. C. B. Ho[5] proposed two models of knowledge sharing build a single-instance two-person game to characterize individuals' tacit knowledge sharing behavior. F. Barachini[6] proposed that the underlying mechanism for knowledge sharing is rather based on a trading process. H. Yang[7] proposed a novel agent-based modeling approach to simulate the actions of knowledge sharing between actors in an organization.

Chinese researchers also studied knowledge sharing. Ji Huisheng [8] investigated the route selection and solutions of the knowledge sharing in the cooperative R&D of enterprises and established the knowledge sharing game theory model of the cooperative R&D of enterprises. Jiang Ronghua[9] conducted a game analysis on knowledge sharing and designed corresponding knowledge contribution incentive function to promote the knowledge sharing behaviors of employees. Jiang Guorui [10] researched the credibility of cooperation and proposed strategies to improve tacit knowledge sharing. Li Dan [11] discussed the cooperative dynamic repeated game in scientific researches and the strategic process of the knowledge sharing in incomplete information game. Chen Lei [12] analyzed the enterprise's knowledge sharing process in the case of incomplete information and limited rationality from the perspective of evolutionary game and concluded the key factors influencing the knowledge sharing relationship evolution of enterprise; Ning Ye[13] analyzed the benefit and costs of the organizations in knowledge alliance in the process of knowledge sharing using complete information dynamic game method.

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