A Multi-Cluster Enterprise Framework for Evolution of Knowledge System among Enterprises, Governments and Research Institutions

Authors : Sohail Ahmed, Ke Xing

Abstract : This research theoretically explored the evolution mechanism of enterprise technological innovation capability system (ETICS) from the perspective of complex adaptive systems (CAS). Starting from CAS theory, this study proposed an analytical framework for ETICS, its concepts and theory by integrating CAS methodology into the management of technological innovation capability of enterprises and discusses how to use the principles of complexity to analyze the composition, evolution and realization of the technological innovation capabilities in complex dynamic environment. This paper introduces the concept and interaction of multi-agent, the theoretical background of CAS and summarizes the sources of technological innovation, the elements of each subject and the main clusters of adaptive interactions and innovation activities. The concept of multi-agents is applied through the linkages of enterprises, research institutions and government agencies with the leading enterprises in industrial settings. The study was exploratory based on CAS theory. Theoretical model is built by considering technological and innovation literature from foundational to state of the art projects of technological enterprises. On this basis, the theoretical model is developed to measure the evolution mechanism of enterprise technological innovation capability system. This paper concludes that the main characteristics for evolution in technological systems are based on enterprise's research and development personal, investments in technological processes and innovation resources are responsible for the evolution of enterprise technological innovation performance. The research specifically enriched the application process of technological innovation in institutional networks related to enterprises.