Modeling the effects of existing knowledge on the creation of new knowledges

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Abstract

Advancing technologies and constantly changing market needs induce competition between organizations and force enterprises to adopt better management methods to improve operational performance to survive and make profits. Knowledge management has been widely recognized as one of the effective methods to achieve the above objective. Previous researches of knowledge management chiefly focused on qualitative approaches, and largely stressed key success factors of knowledge management, such as the infrastructure of information technology, the design of the knowledge management system, deployment of motivation schemes, and the like. Among them, the knowledge spiral of socialization, externalization, connection, and internalization are the core of researches and discussions. However, early studies only disclosed the necessary cyclical phenomenon of knowledge management. A quantitative method revealing how the existing knowledge can support the creation of new knowledge or upgrade current knowledge remains non-existent. To bridge this gap, this study proposes a mathematical model which can quantify the supporting effects of the existing knowledge on the creation of new knowledge. The model evaluates knowledge from the perspectives of complexity (knowledge type/knowledge area) and depth (knowledge level), and the results of the example illustrate that the proposed model can be an effective method of measuring the usefulness of the existing knowledge.

Keyword：knowledge management, knowledge creation, knowledge complexity, knowledge level, knowledge spiral.