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The role of creation mode and social networking mode in knowledge creation performance: Mediation effect of creation process

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ABSTRACT

This study proposes and empirically examines a research model that incorporates the knowledge creation mode and social networking mode to describe knowledge creation performance. The mediation effect of the knowledge creation process is explored in terms of socialization, externalization, combination, and internalization (SECI). The data collected from the manufacturing and service industries in Taiwan were analyzed. The goal-driven mode and web topology are found to be significantly associated with product or service creation primarily because of the creation efficacy aspect. The SECI with web topology has a mediation function when the goal-driven mode is adopted. Implications and suggestions are also provided.

1. Introduction

The implementation of a knowledge management (KM) program in the KM system life cycle generally involves five major stages: knowledge creation, knowledge acquisition/storage, knowledge sharing, knowledge practice, and knowledge appraisal [47]. In particular, knowledge creation deals with aggregated value in several ways, such as sharing mental, emotional, cognitive, and active knowledge [37]. It has distinct and dynamic characteristics that involve such factors as strategy, communication, and processes [6,50]. Although existing studies have identified the important aspects and antecedents that are linked significantly to particular knowledge creation outcomes, they also pay limited attention to the effects of both creation modes (e.g., goal is predefined or not predefined) and the social networking mode (SNM) (e.g., networking by way of hub or web topology) on the creation outcomes. The role of the SECI model (socialization, externalization, combination, and internalization) [33] in these effects on creation outcomes is still under investigation.

In general, the need for knowledge creation to maintain competitive advantage compels organizations to innovate the products and services they deliver to their customers, as well as business management. In practice, organizations develop strategies (e.g., culture-embedded product or service development) that will guide knowledge creation efforts and achieve better creation performance (CP) [21,31]. In a dynamic and fast-changing environment, however, guiding a particular creation task toward the goal is generally not easy. For example, a goal (e.g., defined or undefined) may affect the thinking space and behavior, topologies used to interact and collaborate, and creation processes toward creation outcomes. In this regard, Kao et al. [18] investigated large manufacturing companies with >20 patents in Taiwan and revealed that the knowledge creation mode (KCM) has different effects on creation outcomes. This analysis indicates that a non-predefined goal (goal-free mode) can significantly and positively influence creation outcomes, particularly for product or service creation. In addition, the particular mode with a defined goal (goal-driven) negatively influences creation outcomes. This result implies that a predefined goal is not likely to be a strategy for knowledge creation in the context of larger manufacturing companies with >20 patents in Taiwan. However, the applicability of this finding to both manufacturing and service industries that have fewer patents in developing regions (e.g., Taiwan) but that advocate creation is still unknown.

The creation mode related to a defined or undefined goal may be too straightforward to sufficiently describe creation outcomes. The creation mode may be affected by the process model that drives human thinking behavior toward idea generation and implementation [6,27,36,40]. For example, SECI can improve the

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dynamic conversion process of tacit and explicit knowledge toward positive creation outcomes [6,20,24]. However, Martin-de-Castro et al. [27] conducted a study based on two empirical tests with firms, which revealed that knowledge creation does not constitute a unique process; knowledge creation is generally associated with culture, geographical, and cluster-based arguments. Therefore, further information about the contribution of the SECI process in the creation modes to the creation outcomes is also needed.

Knowledge creation is a multidimensional issue that covers the areas of organizational behavior, leadership, human behavior, technology, environment, and strategy, and their combinations as well. Collaborative creation is an important strategy that organizations adopt to maintain competitiveness [2,20,21]. For example, Khodakarami and Chan [20] reported that collaborative systems likely significantly encourage organizational members to externalize their innovative ideas, whereas analytical systems help integrate these ideas. However, the effects of how members interact on CP still need to be explored. For example, knowledge creation strategies will be improved if a relevant mode is determined, that is, strong central connections and weak associations with one another (e.g., hub topology) or strong one-to-one relationships with others (e.g., web topology) [7]. Evidently, creation outcomes may change along with the change in the adopted creation mode and SNM.

With a relevant creation process presented by SECI [33], members or customers can collaboratively construct new knowledge based on the knowledge that other members possess through communication and interaction [2,26,28]. For example, Mahr and Lievens [26] reported that community users prefer explicit knowledge that members provided, which can be easily integrated into the development of new products or services. Therefore, a creation group is gradually regarded as the atomic union for decoding, deposition, retrieval, and knowledge creation, which can speed up creation tasks. However, the mode that members use to interact within a network may significantly influence creation outcomes [12,15,16]. For example, a network with strong centralization reflects that a group's thinking behavior is based on coaching and learning. This mode refers to hub or core–periphery, in which interaction and communication emphasize knowledge combination and manipulation [5,12]. When expressing a highly distributed interaction, the mode refers to a web or periphery that primarily focuses on knowledge creation through socialization and externalization [3]. However, SECI presented by socialization or externalization that supports the effect of the SNM on the creation outcomes requires further exploration.

Considerable efforts for either examining the theory or performing the confirmatory experiment have been devoted to concept sharing, factor examination, solution finding, and phenomenon exploration in knowledge creation. By specifying the context of manufacturing and service industries in Taiwan, the current research aims to propose and examine a research model that describes knowledge CP by considering the creation mode, SNM, and the SECI process. Because of the data collection limitations in knowledge creation (e.g., company regulations, policies, and privacy) in Taiwan, the current exploratory study adopts an empirical quantitative method and analyzes survey data to derive findings, implications, and suggestions. The rest of the paper is organized as follows. Section 2 presents the antecedents and gaps in the literature on knowledge creation based on the literature review. Research arguments are then hypothesized. Section 3 describes the research method, including the research model, sample, measure, and data analysis techniques. Section 4 presents the data analysis results, discussion, and implications. Finally, Section 5 concludes the research.

2. Related concepts and research hypotheses

2.1. Knowledge CP

Identifying the relationship between knowledge creation and its value to organizations is generally difficult because of the complex relationships among the contributors, particularly when a quantitative approach is applied. For example, high product profits may have multiple contributors (e.g., favorable design, manufacturing technology, pricing strategy, marketing strategy, and pre- and post-service system) and sub-contributors (e.g., favorable idea exchange mode; effective use of social media for the product design; and excellent machine, financial engineering, and leadership). By examining the relationship between the knowledge-related factors and the KM performance index of Korean firms, Lee et al. [47] reported that knowledge creation has the highest weight linked to performance, which is represented by several financial factors, including stock price, price-to-earnings ratio, and research and development (R&D) expenditure, which is translated from management performance. However, tangible performances from product and service creation, manufacturing process creation, management creation, or even strategy creation have not been addressed, probably because of the complexity of measurement and the difficulty of data collection. For example, the data they used to present knowledge creation are based on a questionnaire survey with a seven-digit scale [47]. Moreover, in the context of the high-tech industry in Taiwan, product creation presented by volume, market share, and patents was used to predict the technology commercialization performance [44]. The responses of the subjects were also rated on a five-digit scale. Eventually, the indices for evaluating knowledge CP are needed, whereas creation tasks are executed because of value justification for the created knowledge. In general, the evaluation indices for knowledge creation include five aspects: (1) product or service CP, (2) manufacturing or service process CP, (3) management CP, (4) strategy CP, and (5) organization CP [13,18].

Product or service CP measures the technical performance of new product or service development, such as effectiveness and adaptability. Manufacturing or service process CP pertains to the process of a program, service, and product, including cost, quality, delivery due date, flexibility, and innovation. Management CP examines the effect on the organization through the implementation of the managerial process, plan, flexibility, integration, communication, coordination, and employee cohesiveness. Strategy creation focuses on new product or service positioning, new usage, and redistribution of value activities to enhance competitiveness. Organization CP addresses behavior creation that measures abilities and experiences, such as coordination with international sales, repair and service, establishment of an international brand, as well as planning and management of international distribution. However, the present study only adopts the first three CP indices presented by product or service, manufacturing or service process, and management to address the dependent variables [37] because of the complexity of evaluating strategy and organization CP. Moreover, except the data officially announced by companies (e.g., in their public financial reports), the subjects in Taiwan generally have difficulty in providing internal code information related to knowledge creation because of data unavailability and the prohibition and privacy policies of their respective companies. Alternatively, they tend to provide answers based on perceived concepts, information, experience, and understanding, which are related to knowledge creation for questionnaire items. Thus, the applied measure indices for the current research are based on a five-digit scale questionnaire.