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論文題目	A Study on the Influence of Developmental Culture, Industry 4.0, and the Circular Economy on the Competitive Advantage of the Thai Manufacturing Industry		
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論文の内容の要旨

The manufacturing sector, especially in a developing country such as Thailand, needs to increase competitiveness and move toward sustainable development. The transition to a Circular Economy (CE) and Industry 4.0 can be considered an important factor in achieving these targets. Manufacturing companies in a developing country are often subject to resource limitations, which can restrict the efficient transition. To promote a successful transition, firms should understand the factors that influence this transition and its impact on competitive advantage. However, there are still limited empirical studies addressing the influence of organizational culture on this transition and linking cultural aspects together with the transition to a firm's competitive advantage. Therefore, this study examines the effects of organizational culture, i.e., developmental culture, on the implementation of Industry 4.0 and CE for competitive advantage in the context of the Thai manufacturing sector. The findings are based on primary data collected using a survey questionnaire. The data was analyzed using Structural Equation Modeling (SEM). In total, 354 survey responses from participants in the Thai manufacturing sector were used for the analysis. The findings demonstrate that developmental culture contributes positively to Industry 4.0 and CE adoption and to a firm's competitive advantage. The adoption also leads to enhanced competitive advantage. Industry 4.0 positively supports CE implementation in the Thai manufacturing sector. The findings help manufacturing companies understand the necessary cultural characteristics, aiding the transition. This study contributes to the literature by providing inputs to support Industry 4.0 and CE advancement, which eventually can lead to sustainability improvement.

Keywords: Developmental culture, Industry 4.0, Circular Economy, Competitive advantage, Sustainability

論文審査の結果の要旨

Nowadays, the manufacturing sector, particularly in developing countries, must enhance its competitiveness and advance toward sustainable development. The shift toward a Circular Economy (CE) and Industry 4.0 is considered to play a crucial role in this transition. Manufacturing companies in developing countries often face resource limitations that can hinder an efficient transition. So to ensure successful progress, firms need to understand the factors influencing the transition and its impact on their competitive advantage. This dissertation research aims to explore the influence of organizational culture on the transition process and how it connects cultural aspects with firms' competitive advantage. Specifically, the study examines how organizational culture affects the implementation of Industry 4.0 and the Circular Economy (CE) to enhance competitive advantage within the Thai manufacturing sector. The main contributions are summarized as follows.

This research developed a theoretical framework for connecting organizational culture, technology adoption, the implementation of Circular Economy (CE) practices, and the enhancement of a firm's competitive edge, drawing on the Technology-Organization-Environment (TOE) framework, Socio-Technical Systems, Resource-Based View (RBV), and Natural-Resource-Based View (NRBV). Then, hypotheses on the linkage between the constructs within the proposed theoretical framework were established for an empirical study conducted in the context of the Thai manufacturing industry. The results of this study hopefully enhance the understanding of the cultural conditions that help firms effectively implement Industry 4.0 and Circular Economy (CE) practices, thereby enabling companies to achieve a competitive advantage.

This dissertation has made significant contributions both theoretically and empirically in the field of operations and production management. The research work presented in this dissertation has resulted in two journal papers and one refereed conference paper.

In summary, Mr. PIYATHANAVONG Vichathorn has completed all the requirements in the doctoral program of the School of Knowledge Science, JAIST and finished the examination on August 01, 2024, all committee members approved awarding him a doctoral degree in Knowledge Science.

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