Chapter 64

Innovation Capability for SME Biomass Industry Performance:
Perspectives of HRM, OC, KMC in Industry 4.0

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ABSTRACT

Industry 4.0 exerts great pressure on the organization today to innovate its business model in order to stay competitive. This study examines the positive and indirect effect of human resource management, organizational culture, knowledge management capabilities on organizational performance, with the mediating effect of organizational innovation capability among small and medium-sized enterprise (SME) in biomass industry in Malaysia. In addition, this study integrates resource-based view (RBV) and dynamic capabilities theories to investigate how the organization utilize its resources and capabilities to enhance organizational performance. Data were collected using survey questionnaire from biomass SMEs located in Malaysia. Structural equation modelling (Smart PLS 3.0) was used to test and analyze the data. The findings reveal that knowledge management capability and organizational culture exert a positive influence on organizational innovation capabilities. Similarly, organizational innovation capabilities also found to positively affect organizational performance.

INTRODUCTION

SMEs Biomass Industry (Malaysia) in Industry 4.0

In 2018, Malaysia's small and medium enterprises (SMEs) contributed to gross domestic product (GDP) at 38.3% (RM521.7 billion) and total exports at 17.3% (RM171.9 billion) (Department of Statistics Malaysia, 2019). It shows that SMEs play a significant role in the economic growth of Malaysia. To prosper and survive in Industry 4.0, SMEs in the biomass industry require new paradigms to improve its internal resources, capabilities and organizational performance. Table 1 depicts the definition of SME in Malaysia (SME Corporation Malaysia, 2019).

Table 1. Description of Small and medium enterprise (SME)

Sector	Annual Sales Turnover	Full-time Employees
Manufacturing	≤ RM50 million	≤ 200
Service	≤ RM20 million	≤ 75

Source: SME Corporation Malaysia, 2019

Unlike other countries, Malaysia has abundant of sustainable and accessible biomass resources, such as empty fruit bunches, palm kernel shell, rice straw, wood biomass, municipal solid waste, manure, oil palm trunks and able to produce biomass output such as biopolymers, bio-energy, bio-fertilizer, bio-composites, bio-chemical (Malaysia Industry-Government Group for High Technology (MIGHT), 2013). Biomass is a carbon-neutral fuel that can assist Malaysia to reduce carbon emission intensity per unit of GDP at 45% in 2030 (World Energy Council, 2018). The renewable energy from biomass can generate electricity, reduce the dependency on 90.5% of imported coal (Hamzah, Tokimatsu, & Yoshikawa, 2019), replace fossil fuel, diesel and diminish greenhouse gas emissions in Malaysia (Mekhilef, Barimani, Safari, & Salam, 2014).

Japan, Korea, and China are the leading importer of biomass pellets (Malaysia Industry-Government Group for High Technology (MIGHT), 2013). In the year 2020, the European Union plan to consume more than 50% of biomass energy and South Korea will import up to 80% of pellets into their country (Malaysian Industry-Government Group for High Technology (MIGHT), 2014). To fulfill the global demand, Malaysian SMEs in the biomass industry should improve organizational innovation capability and performance by using digital technologies (Ministry of International Trade and Industry (MITI), 2017).As industry 4.0 comprises of cyber-physical system (CPS), internet of things (IoT), cloud computing (Iqbal & Nawaz, 2019) so SMEs in the biomass industry should incorporate these technologies to digitize the manufacturing and organizational processes. CPS is the integration of physical components, algorithms, communication and control systems that help the biomass manufacturing SMEs to have autonomous production processes and real-time control on the machines (Moeuf, Pellerin, Lamouri, Tamayo-Giraldo, & Barbaray, 2018; Vaidya, Ambad, & Bhosle, 2018; L. Da Xu, Xu, & Li, 2018). IoT technology refers to real-time communication using physical component, for instance, radio-frequency identification (RFID), mobile devices and global positioning system (GPS), in which these devices can connect with cellular network, Wi-Fi to assist managers in biomass SMEs to make decentralize deci-

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