Chapter 18
A Knowledge Network and Mobilisation Framework for Lean Supply Chain Decisions in Agri-Food Industry

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ABSTRACT

Making the right decisions for food supply chain is extremely important towards achieving sustainability in agricultural businesses. This paper explores that knowledge sharing to support food supply chain decisions to achieve lean performance (i.e. to reduce/eliminate non-value-adding activities, or "waste" in lean term). The focus of the paper is on defining new knowledge networks and mobilisation approaches to address the network and community nature of current supply chains. Based on critical analysis of the state-of-the-art in the topic area, a knowledge network and mobilisation framework for lean supply chain management has been developed. The framework has then been evaluated using a case study from the food supply chain. Analytic Hierarchy Process (AHP) has been used to incorporate expert's view on the defined knowledge networks and mobilisation approaches with respect to their contribution to achieving various lean performance objectives. The results from the work have a number of implications for current knowledge management and supply chain management in theory and in practice.

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INTRODUCTION

Sustainability of agriculture has been recognised as an important issue in recent years and lean has been regarded as an effective approach towards achieving the sustainability in food supply chains. Lean principles, concepts, tools and techniques have been developed and applied widely in the manufacturing industry due to the original contribution and tremendous influence from Toyota Production Systems (Slack, Brandon-Jones & Johnston, 2013). Applying lean thinking in food supply chains is however an underdeveloped topic because of a number of challenges including the lack of understanding of the nature of "waste" (i.e. any activities not adding value defined by lean theory) and lack of mature means of eliminating/reducing waste in food supply chains (Folinas et al, 2013). Subsequently, there is little report on best practices or lessons learnt on the topic of assessing the lean performance in food supply chains.

Knowledge management is a well-developed area which has been widely practised in supply chain context (Asgari et al, 2016). Various knowledge management approaches, models and systems have been developed including knowledge creation, knowledge sharing, knowledge retention and application in both downstream and upstream supply chains (Shih et al, 2012; Clemons & Slotnick, 2016). With a closer look, the supply chain decisions that have used knowledge management theories cover many aspects such as ordering, procurement, distribution, supply chain configuration, location decisions, investment and strategy. Comparatively, the knowledge support for supply chain to achieve lean performance is scarce (Liu et al, 2012).

This paper is concerned with knowledge flow and sharing across stakeholders in supply chains and focused on knowledge networks and mobilisation in current digital environment and knowledge economy. An innovative knowledge network and mobilisation framework for lean knowledge supply chain decisions (Lean-KMob framework) has been developed. Three main constructs defined in the Lean-KMob framework include lean performance with specific measures, knowledge network types, and knowledge mobilisation approaches. The Lean-KMob framework is evaluated using empirical data from food supply chains. Key contributions of the work include the definition of key constructs and variables as well as the relationships among them, which can provide important implications for knowledge management and supply chain practice.

The paper is organised as follows: the following section reviews relevant work and identify research gaps in the literature. Section 3 presents the Lean-KMob framework in details. Evaluation of the framework is presented in Section 4 using a case study from food supply chains. Finally, Section 5 discusses further issues and draws conclusions.

RELATED WORK

This section reviews existing work in the topic area and looks at how the concept of supply chain (SC) and supply chain management (SCM) has evolved over time, including its integration with lean philosophy and lean SC decision making requirements. At the end of the literature review, the research gaps are identified in terms of knowledge management support for lean SCM decisions.

SC as a concept has been around since early 1980s. There have been a number of definitions available for supply chains. For example, SC was defined by the Institute of Logistics and Transport (CILT, 2016) as a sequence of activities in moving physical products or services from a point of origin to a point of consumption, including procurement, manufacture, distribution and waste disposal (Crandall, Crandall