

Chapter 73

Impact of Lean Supply Chain Management on Operational Performance: A Study of Small Manufacturing Companies

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ABSTRACT

Lean is a systematic approach to identify and eliminate non-value-added activities or waste through continuous improvement process. While traditional lean manufacturing focuses on the activities within a single organization, lean supply chain consists of the same processes, but it views these processes over multiple organizations. This research addresses an important yet under-studied area – lean supply chain management in small organizations, especially small manufacturing firms. The study examines driving factors of lean supply chain management, focus of lean supply chain practices, and major supply chain and information technology solutions applied in these companies. Through a research survey, the study has provided important insights into the current status of lean supply chain practices and related implementation issues in small businesses.

1. INTRODUCTION

Lean is a systematic approach to identify and eliminate non-value-added activities or waste through continuous improvement process. Waste is anything other than the minimum amount of equipments, materials, components, and working time that are essential to the manufacturing process. The practice of “lean manufacturing” originated from Toyota that used names such as “Just-in-Time” manufacturing or

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“Toyota Production System” (TPS) in the 1950s. The main goal of TPS was to reduce costs and improve productivity by eliminating wastes or non-value activities (Womack et al., 1991). Lean is regarded as “continuous flow” to the assembly line process with a focus on cost reduction, quality improvement, and throughput, which is recognized as the most advanced manufacturing process by both practitioners and academicians.

1.1. Lean Manufacturing

Initial lean efforts were made to reduce wastes within organizations. From the production and inventory perspective, waste can be classified into several types, such as production waste, waste of waiting time, transportation waste, inventory waste, processing waste, and waste from product defects. Various lean tools and techniques were invented, applied, and refined in different areas to help companies operate more effectively and efficiently. In the early manufacturing stage, lean initiatives were focused on specific areas and functions within the firm, such as engineering, production, and quality control. While implementing lean programs and tools in these areas, firms found that close intra-organizational and cross-functional collaborations were necessary and important to the success of lean. As a result, lean efforts were gradually expanded to full organizations in the process of waste reduction and value creation, aiming to become lean enterprises.

The desire for cheaper materials and labor sources motivates many companies to engage in more international procurement and outsourcing activities to reduce costs. Large companies have either established production facilities, or completely outsourced manufacturing to low cost countries and regions. Inevitably, such practices involve more international suppliers in the extended supply chain, with both benefits and potential risks. Firms are not only required to monitor their internal operations, but their partners’ as well so as to achieve lean in the entire process. In fact, as lean evolves from lean manufacturing to lean enterprise, and eventually to lean supply chain, many organizations have become to realize that optimizing a part of the process is different from optimizing the whole. If real changes were to take place, they had to include their business partners in the existing firm-based lean efforts. Companies must extend their boundaries to their suppliers and customers to reach the global optimum.

1.2. Lean Supply Chain

A supply chain is a complex system consists of organizations, people, technology, activities, information, and resources. Supply chain activities transform natural resources, raw materials and components into semi-finished and finished products, which are then delivered to distributors or end customers. According to the Council of Supply Chain Management Professionals (CSCMP), supply chain management emphasizes the coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers, and integrating supply and demand management within and across organizations.

Since a supply chain contains many entities and activities, wastes in the interaction points of these entities and activities are created. For example, when the suppliers of a manufacturer are supplying only in bulks and the lead times are longer, then the manufacturer not only needs to carry more inventories itself but requires more time for production planning.

Similarly, the lack of lean in downstream distributors and retailers may lead to information distortion and demand exaggeration, which further cause significant inventory buildup at the manufacturer,

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