Chapter 55
Lean Management and Supply Chain Management: Interrelationships in the Aerospace Sector

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ABSTRACT

This chapter evaluates the state-of-the-art of research on Lean Management and Supply Chain Management strategies in the aerospace sector using Systematic Literature Review methodology. The complementary aims are: a) to identify the topic set studied and to propose a criterion for classifying the literature, and b) to discuss the empirical evidence that identifies existing interrelationships. The analysis has enabled three main topics to be identified: a) adoption and implementation of lean management, b) development of supply chain management, and c) deployment of lean principles and practices across the supply chain. A number of more specific lines of research are also proposed that have been assigned to each of these three main research topics. Finally, a set of challenges and opportunities for future research are set out, along with a range of academic and professional implications that could be useful not only for the aerospace sector but also for other industrial sectors that share similar contingent factors.

INTRODUCTION

Lean Management (LM) has evolved and expanded significantly since its dissemination (Womack et al., 1990). On the one hand, it has moved forward from being a production system focused primarily on eliminating the waste and reducing the variability produced on the factory floor level to being a wider-ranging management system addressing these main objectives from both an internal and an external approach (Hines et al., 2004; Shah and Ward, 2007). LM has thus evolved towards being a holistic management system focusing on the adoption and further implementation of its guiding principles, practices and tools both inside an organization as a whole and across the entire supply chain.

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On the other hand, and at the same time, LM has spread beyond its origins in the automotive sector and been embraced in an array of economic sectors, including a number of service and industrial sectors (Moyano-Fuentes and Sacristán-Díaz, 2012). Research has matched this change and sought to identify the causes and consequences of LM transition by analyzing it in industrial sectors other than the automotive sector. The rationality behind this is the contingent factors found in different industrial sectors that play a crucial role in the transformation (Crute et al., 2003; Pérez et al., 2010). One growing trend that merits special mention is the recent trend in doing research in LM in sectors, such as the aerospace sector (Ehret & Cooke, 2010), where Supply Chain Management (SCM) plays a key role in company competitiveness.

As far as SCM is concerned, this strategy has been a cornerstone for competing in the current environment for several decades. It is in fact well-known that companies no longer compete as individual organizations, but as complete supply chains (Frohlich & Westbrook, 2001). SCM is a broad concept that has evolved over time. A Supply Chain Integration (SCI) (Pagell, 2004; van Der Vaart & van Donk, 2008) focus can be detected as far back as a decade ago. This focus requires companies to strategically align and integrate both their internal and their external processes with those of their key partners in the supply chain. A large number of companies in a variety of sectors have therefore adopted this focus and made advances in their levels of supply chain integration. Despite this, various authors emphasize that a low level of integration is the norm and that further research is therefore required into the dynamic of key contingent factors to determine how the principles and practices of SCI can most effectively be adopted and implemented due to the impact that these factors have on results on the supply chain level (Ho et al., 2002; Flynn et al., 2010).

Despite the importance of considering the role of contingent factors in these two strategies, a number of studies highlight the fact that this is not the case. With regard to LM, various researchers underscore the importance of determining how become Lean in different contexts (Shah & Ward, 2003; Browning & Heath, 2009). Meanwhile, others emphasize the lack of attention paid to contingent factors in SCM research (van Der Vaart & van Donk, 2008; Giménez et al., 2012). In general terms, Sousa and Voss (2008) stress the urgent need for a contingent focus to be considered in Operations Management research. This is the reason why this chapter focuses on investigating the role of contingent factors in these two strategies in a specific sector, the aerospace sector.

The world aerospace sector has been subjected to several critical changes, such as the changing role of governments, dramatic reductions in the defense and space budgets, changes in commercial conditions, increasing global competition and the challenge of adapting to technological changes, among other issues (Murman et al., 2002; Crute et al., 2003). These competitive priorities are related to improving delivery reliability, delivery times and production quality, increasing productivity and reducing inventory and operating costs, inter alia (James-Moore & Gibbons, 1997; Smith & Tranfield, 2005).

Despite this, an inability to respond to unforeseen changes in demand and delays in deliveries are still widespread problems. Competitiveness in this industry depends to a great extent on companies' internal flexibility, on adapting products to customers' needs and on improving SCM integration. These priorities can be achieved by adopting and implementing strategies like LM and SCM (Womack & Jones, 1996; Smith & Tranfield, 2005).

Given all this, and on the basis of some concerns regarding the simultaneous application of these strategies in this sector, the objective of this chapter is to evaluate the state-of-the-art of research into LM and SCM, and their interrelationships in the aerospace sector from a holistic focus. For this a Sys-