

Chapter 79

Bibliometric Analysis of Lean, Agile, and Leagile Supply Chains in Automobile Industry (1990 – 2017)

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ABSTRACT

This article describes how organizations embrace various supply chain strategies aiming at effective and efficient performance outcomes for gaining competitive advantage. The authors conducted an extensive search for academic publications on lean, agile, and leagile (hybrid) supply chains in context with automobile industries, published since year 1990 in reliable repositories such as Google Scholar, Scopus and ResearchGate. None of these papers used bibliometric analysis on the topic. This paper systematically maps, publications on lean, agile, and legal strategies in automobile industry published during 1990–2017. A five-step process is followed, namely (i) defining appropriate search terms, (ii) initial search results, (iii) refinement of search results, (iv) initial data, statistics, and (v) data analysis; adopted for inclusion of relevant documents for publication and citation analysis. Selected documents include primary search term ‘automobile’ along with associated secondary terms such as ‘lean’, ‘agile’, ‘lean and agile’, and ‘leagile’ as part of the title, abstract, or keywords. The analysis finds several documents on lean or agile strategies, but only one document exists on ‘leagile’ paradigm. Maximum articles are contributed on engineering subjects followed by business, management and accounting and computer sciences. Large publication and high citation counts were observed for lean from United States and Chinese authors, whereas Indian authors contributed in agile studies. This article identifies areas of current research interests discussing crucial contributions by several authors’ and provides potential directions for further research investigations in the field.

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INTRODUCTION

Supply Chain Management Strategies

The vital role of supply chain management (SCM) in augmenting the automotive performance cannot be undermined (Ambe & Badenhorst-Weiss, 2010) and as a major source of competitive advantage to the automobile industry (Choi & Hartley, 1996; Christopher, 2000; Gunasekaran & Ngai, 2004; Sahay et al., 2011; Barney, 2012). Ambe and Badenhorst-Weiss (2010) observe that changing market conditions of the 21st century, along with globalization, economic uncertainty towards newer technologies and growing consumer demands are critical issues for concern. The automotive supply chains have become increasingly complex, seriously affecting profitability and shareholder value in terms of longer order-to-delivery lead times, surplus inventory across supply chains, unreliability in production schedules, and lack of supply chain visibility. Hence, adopting an effective and efficient supply chain strategy is necessary for automotive and their component manufacturers to address ever-changing consumer demands. Supply Chain Management (SCM) gains considerable attention for its focus on material, information as well as cash flows in the total supply chain right from suppliers' suppliers through customers' customers and vice-versa. A noted feature of present day business is the idea that supply chains compete, not companies (Christopher & Towill, 2001) and the success or failure of supply chains are ultimately determined by the end-consumer in the marketplace. It is contingent upon businesses for their survival and competitive success to get the right product, at the right price, at the right time to their final consumers. Hence, marketplace understanding, and customer satisfaction are critical elements to be considered while establishing a supply chain strategy. Against this backdrop, the past two decades or more has seen supply chain management highly concentrating on lean concepts. Strategies such as, just-in-time (JIT), virtual inventory, outsourcing, waste minimization (value stream mapping), reduction of buffers in materials, time and capacities, customized and global networks etc., have enabled organizations in reducing overall costs and enhancing supply chain performance. However, Elkins et al., (2004) argued that lean supply chain strategy alone cannot cope with the demand uncertainty whilst vulnerability and turbulence in a volatile business environment. In order to achieve high degrees of flexibility and consumer responsiveness, there is need for combining suitable newer technology along with lean philosophies namely, agile supply chain systems which can respond cost-effectively to uncertain product demands and support rapidity in product launches to meet changing consumer needs. In recent years, significant interest is observed in the ideas of 'lean' and 'agile' supply chain strategies and is recognized an important strategy for effective and efficient supply chain management as well as organizational success. The concept of 'Lean' refers to doing more with less to imply a zero inventory and using a just-in-time approach. The origins of lean thinking and manufacturing can be traced to the Toyota Production Systems (TPS) which primarily focuses on reducing and eliminating wastes. 'Agility' on the other hand is needed in lesser predictable environments, especially wherein demand is quite volatile and requirement for variety is high (Christopher, 2000). In a continuously changing competitive environment, an organization's supply chain agility has a direct impact on its ability to produce and deliver innovative products for their customers in a cost-effective and timely manner (Swafford et al., 2006). Agility is a business-wide capability that embraces organizational structures, information systems, logistics processes and in particular, mindsets (Katayama and Bennett, 1999; Power et al., 2001; Manzouri et al., 2015). In addition to the above, recent academia and scholarly attention have focused towards a hybrid approach (e.g., leagile) supply chain strategy which is a combination of both lean and agile strategies. The concept of 'leagile' (Naylor et

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