

Book Review: Multi-tier Supply Chain Visibility in the Automotive Industry

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Abstract- This book investigates how to integrate intra-and inter organizational automotive supply chain entities into a holistic supply chain visibility (SCV) system which can be established in automotive supply chains for creating performance improvements in collaboration, delivery of high performance and efficiency. The theoretical part of the book clarifies the fundamentals of SCV assessing the existing technological developments from the electronics industry as well as general implications of information sharing and transparency on corporate performance. It also explains the current economic pressures, principal supply chain structures and efforts for creating supply chain visibility in the automotive industry. The foregoing theoretical findings with a practical analysis of an automotive engine supply chain as a case study is also united at the empirical part of this book. The author presents a practical framework entitled Virtual Command Center for the electronics industry to the particular requirements of the automotive industry which describes major drivers, goals, barriers and implications of automotive supply chain visibility (SCV).

Keywords— Supply chain visibility, partner integration, supply chain optimization, automotive supply chain, Virtual Command Center

1. Introduction

With globalization, the competitive business environment has motivated companies to pursue information sharing and collaboration in inter- and intra-organizational Supply Chains (SC) to introduce performance and costs optimization initiatives through enhanced transparency. Like other companies, automotive supply chains (SC) have also become increasingly complex and have interconnected entities including a multitude of

organizations.

In the current economic depression, the automotive industry has been hit hard by the world-wide decline in demand leading to a consolidation of the industry through a chain reaction of bankruptcies of automobile manufacturers and their depending suppliers. A high degree of visibility aiming to decrease operating costs and to increase service levels by enabling faster decision making, improving internal and external collaboration and by integrating previously detached operational silos in multi-tier SCs is viewed as the key for developing strategic competitiveness by company executives.

However, the current state of research in supply chain management (SCM) does not provide a satisfying resolution for the question how cross-organizational visibility can be reached in multi-tier SCs by integrating the suppliers and original equipment manufacturers (OEM). The hypothesis of the book is that by applying visibility solutions a seamless integration of automotive SC entities is possible that can create performance improvements in collaboration, delivery performance and improve efficiency.

In particular, this book illustrates that SC performance is influenced by several drivers, namely the production, inventory, location and transportation-driver. Information sharing holds a central function as a connector and amplifier between the aforementioned SC performance drivers. The concept of SCV refers to the idea that by achieving a sophisticated access to information and by collaboratively disseminating them across organizations and functions, overall SC performance can be improved. Enhancement of SCV is pursued with the aim to achieve higher efficiency, reliability, flexibility and improved customer-responsiveness in the SC.

2. Review of the Book

There are five chapters in this particular book which sequentially describes the overall advancement of knowledge of SCV in the automotive industry by identifying drivers, objectives, barriers and practical implications of SCV that confront automotive companies. Chronological chapters expand existing SCV theory towards the consideration of conditions in the automotive industry, and combine a variety of previously researched spheres, like technology, organization, SC optimization and partner incentivisation into a holistic set of automotive visibility practices.

In the introductory chapter, the author has explained the goals, chronological procedures and research questions of the book. The goals stated here are to provide the reader with a thorough understanding of general drivers of SC performance and the importance of the information sharing driver, to identify dominant practical drivers, obstacles and strategic implications of visibility for the automotive industry, to develop an appropriate organizational and technological solution, to identify obstacles and best practices for reaching cross-organizational visibility between automotive OEMs and multi-tier partners enabling improvements in performance, flexibility and cost-efficiency and to create a framework for analyzing the automotive SC offering the reader a tool for assessing the status-quo of SCV. This allows the discovery of potential visibility gaps on a strategic level and the identification of measures on how to advance an organization towards the highest levels of end-to-end SC integration. Here, the author also identified several research topics as the research query, i.e. finding the strategic importance, dominant drivers and goals; critical barriers for SCV; acknowledging appropriate SCV solution for the automotive industry; recognizing the best practices for conducting a SCV project and future strategic implications and developments of SCV in the automotive industry etc.

The second chapter entitled “Literature review: Supply chain visibility” highlighted the objective of providing an analysis of SCV in the context of automotive SCs and identifying the area of significant interest for the subsequent empirical research. Beginning with the elucidation of major drivers for SC performance, information was presented as the key building block for the concept

of SCV. Literature was also reviewed to identify enablers and obstacles of visibility and to examine the current state of research for integrating partners into collaborative automotive SC networks. This chapter also concludes that SC performance is influenced by the production, inventory, location and transportation drivers; collaboration and information sharing is paramount to optimizing processes in and between SC drivers. Visibility results in higher efficiency, flexibility and customer –responsiveness and the automotive industry has recognized the need for SCV because of pressures from globalization and customer demands.

“Research Methodology” at chapter three is aimed at elucidating the research problem and objective of the book and at defining the methodological framework. By explaining the research methodology for the empirical part of the book and by outlining possible methodological limitations, the reader will be provided with an extensive insight about the objectivity, validity and reliability of the book.

In chapter 4 (Research results & discussion), the author extended the contribution of the book by presenting outcomes from the empirical case study and associated qualitative semi-structured interviews. Findings had been discussed critically and contrasted against major ideas from literature, and developed further by the author. The reader would receive extensive practical insight into possibilities for achieving SCV in automotive SCs by analyzing the results presented according to research objectives and discussion with special consideration to different tiers in the automotive SC. This chapter combines the identified scenarios into a proposed holistic SCV solution and demonstrates its potential future application.

The chapter five is devoted to summarize the significant findings of empirical research in field of automotive SCV. Here, he author provided answers to research questions developed in the methodology chapter and drew conclusions that emerge from the implementation of SCV solutions in the automotive industry. Furthermore, the research approach was evaluated and recommendations for future research were provided in this chapter. Empirical research results illustrate that SC and industry conditions in the automotive field differ from the electronics industry. The automotive SC is highly complex and long requiring components, processing and

transformation from a multitude of interrelated international suppliers and internal OEM's units on wide-spread stages of value added.

3. Discussion

The book contributes to the overall advancement of knowledge of SCV in the automotive industry by identifying drivers, objectives, barriers and practical implications of SCV that confront automotive companies. Drawing conclusions from practical experiences of the visibility case study, a realistic understanding about characteristics of complex automotive SC networks and fields of potential SCV applications is achieved.

The book expands existing SCV theory towards the consideration of conditions in the automotive industry, and combines a variety of previously researched spheres, like technology, organization, SC optimization and partner incentivisation into a holistic set of automotive visibility practices.

The book illustrates that SCV enforces corporate service-, quality- and cost-performance. Forging visibility capabilities in the SC represents a key-initiative to leverage existing internal and external resources' competences, through an improved orchestration of information allocation.

The empirical analysis of the OEM's engine SC has led to the development of a sophisticated organizational and technological SCV concept. Aligned to the particular requirements of the OEM's engine SC, the solution provides visibility into the up-stream, mid-stream and down-stream automotive engine value chain and caters for improved SC partner collaboration.

The question emerges if the investigated engine case study can be utilized as a representative reference for SCV in the automotive industry. The author holds the opinion that it is representative because it is characterized by common attributes of international automotive SCs.

4. Conclusion

The proposed SCV solution in this book offers visibility improvements for a variety of internal and external partners in the engine SC. It is focused on overcoming organizational and system boundaries in the long SC. The general assessment shows that the identified SCV scenarios provide major

benefits in creating transparency throughout the SC, improving delivery reliability, enhancing planning and process quality, increasing reactivity to disruptions and reducing lead-times. However, the concept provides mediocre benefits for cost and inventory buffer reduction.

The book utilizes qualitative semi-structured interviews and the assessment of an automotive case study consulting project as research tools. This provides immediate practical and insight into the feasibility of automotive SCV in the automotive industry. It enables an in-depth assessment and discussion from different perspectives including case study OEM interviewees, business consultants, external suppliers and SCV experts.

The book helps automotive professionals and consultants to develop an awareness of possibilities for achieving performance and efficiency improvements through transparency in automotive SCs. It elucidates technological requirements of holistic automotive SCV solutions and develops an understanding on how to introduce SCV in the automotive industry. The book offers an in-depth discussion of implications of automotive SCV beyond the scope of the investigated SC.

Reference

Karl J. Garjczyk, *Multi-tier Supply Chain Visibility in the Automotive Industry*, LAP LAMBERT Academic Publishing, AV Akademikerverlag GmbH & Co. KG, Saarbrücken, Germany, 2013. ISBN: 978-3-659-33798-3

2 Supply chain flexibility for the automotive industry. Table of contents. Supply chain challenges Efficiency Emerging markets and globalization Collaboration Talent Sustainability. Sustainability Companies want to reduce carbon emissions across the manufacturing lifecycle, not just in the finished product. Together with their providers, they develop embedded sustainability programs and reduce the carbon footprint in day to day operations across the entire supply chain. Emerging markets and globalization China's ascendency to become the largest market and Russia's growing eminence in Europe is presenting challenges through inadequate transport infrastructures and economic uncertainty.