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**AN ANALYSIS ON THE GLOBALIZATION AND  
CAPABILITIES OF SUPPLY CHAIN  
MANAGEMENT TO SUPPORT AUTOMOTIVE  
INDUSTRIES**

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# An Analysis on the Globalization and Capabilities of Supply Chain Management to Support Automotive Industries

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**Abstract – The automotive companies in the world are facing new and pressing challenges. In future due to globalization, the automotive supply chain should focus on exploring innovative methods to reduce operating costs, lead times and inventory to sustain their growth rate in market. Globalization will foster a substantial industrial reorganization in the automotive industry. The study of the automotive supply chain management deserves careful attention. In future instead of brand versus brand or store versus store it will be supplier brand –store versus supplier–brand–store or supply chain versus supply chain. Size**

**will no longer be a guarantee of success. Only that companies that will find new ways to create profits will only prosper in future. The purpose of this paper is to present a short overview of the globalization of supply chains in automotive industry focusing on their future perspective and how the company should focus on building a smarter supply chain to overcome emerging challenges.**

**The goal of this paper is to analyze how the major trends acting in the automotive industrial segment impact its supply chains through the development of SCM capabilities. The paper offers a case study that associates the automotive trends to the strategic goals of a vehicle manufacturer regarding the supply chains of a specific vehicle module. Within this association, we analyze how the SCM capabilities are related to this OEMs strategic goal and correlate the trends with the capabilities developed within the vehicle module's supply chains.**



## INTRODUCTION

For more than a decade, supply chain management (SCM) has received increased attention among the industries for achieving competitive advantage. Some of the benefits of SCM, which are predominantly discussed in the literature, include lower inventory levels (Closs et al. 1998; Pagel 1999; Stank et al. 1999; Quinn 2000), better responsiveness (LaLonde & James 1994; Stank et al. 1999), and lower throughput time (Stank et al. 1999).

Some issues such as IT-enablement of supply chains, buyer-supplier relationships, and inventory management are at the core of the supply chain research and have been given a lot of attention in the literature (e.g., Monczka 1996; Nielson 1998; Bensaou 1999; Pagel 1999; Handfield & Nichols 1999; Ballou et al. 2000; Handfield et al. 2000). There are, however, some other issues such as postponement (Anderson et al. 1997; Metz 1998), attitude of major stakeholder of the supply chain (Ballou et al. 2000; Munson et al. 2000), top management commitment (Higginson and Alam 1997), disparity in trading partners' capability (Kwan 1999; Sohal et al. 2001) etc., which influence these core issues. The literature on SCM has many references about these issues but lacks in providing

enough empirical evidence of these relationships. Further, it is also important to identify the relative influence of these issues on a SCM attribute. This is more relevant in the Indian context, where most studies on SCM either consist of case studies or descriptive statistics alone (e.g., Kadambi 2000; Sahay et al. 2003). Therefore, in this article few hypotheses have been proposed to test the relationships among common SCM issues. To test these hypotheses the authors conducted a survey of the Indian manufacturing companies.

There have been many changes and advancements in the business conditions of the 21<sup>st</sup> century due to which the companies are facing new challenging issues ranging from globalization, economic uncertainties up to new technological changes and increase in demands of the customer. In the automotive industry as manufactures design and build vehicles globally the supply chain becomes more and more complex with many challenges that often stand in the way of higher shareholders value and profitably such as very long order to lead delivery times, unreliable production schedules, excess inventory across supply chains, lack of visibility of suppliers and lengthy demand planning cycles.

But above all these factors that hinders the effective supply chains in generating huge profits is that of globalization. Globalization is the primary challenge that ranks higher. Due to the effect of globalization, in future there will be increased pressure on the automotive executives to make right decisions about their supply chains for better performance. The future environment of the market will be highly challenging and competitive and therefore an effective and smarter supply chain strategy will be an effective tool for improving the organization competitiveness. In future, an effective and efficient supply chain will be a must for automotive manufacturers and their component manufacturers so as to earn profits and good market position globally. In this dynamic environment a superior supply chain is a critical element in helping automakers in differentiating themselves from competition. In fact many of the automotive industry are reinforcing the needs to innovate and redefine supply chains strategies, layout and operations. If the system could be managed efficiently supply chain could be a major force in building sustainable competitive edge for the company in the coming highly competitive market. Globalization can be defined as a phenomenon, a process, a state or a concept. It has evolved partially because of the trend for increasing international trade across national boundaries and the conduct of business activities in more than one country and because of the changes in the various aspects of the international business environments. Put in simple words, it is a process that refers to the growth of interdependencies between national markets and the industries on a world wide scale. This growing interdependency between the national economies thus resulted in a trend towards global markets, global production and global changes in the competition. The changes in the political attitudes and economic policies have allowed the companies to take advantages of the technological advances.

There has been much convergence of global economic thinking. Also social trends have also changed as consumers apparently became less concerned with national identity of product. Theodore Levitt (1983) was one of the first academics to write about globalization. In 1983 he said that technology is the driving force behind the globalization of markets and, thus, a 'converging commonality' in countries around the globe.

Increasing competition and low profitability has forced manufacturers to go beyond their own factory gates and search for improvements in the interaction with their suppliers and customers along their supply chains. This new logic in competition, based on supply chains, has inspired the appearance of Supply Chain Management (SCM).

SCM is defined by the GSCF (Global Supply Chain Forum) as the integration of key business processes from end user through original suppliers that provide products, services and information that add value for customers and other stakeholders (Lambert et al.,

1998). One of the critical issues concerning SCM is the development of SCM capabilities that allow activities and processes to be integrated, throughout the supply chain, adapting suppliers and customers to the new logic in competition and providing competitive advantage (Rice & Hoppe, 2001; Lummus et al., 1998). SCM capability is a set of actions that uses the assets of a supply chain to create, produce, and commercialize a product, providing final customers with an essential benefit (Scavarda & Hamacher, 2003).

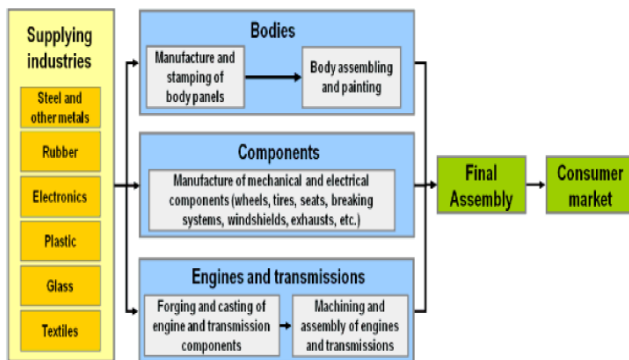
The automotive industry has been very active in the development and introduction of new management systems worldwide, for instance, SCM. Therefore, it is presently developing and introducing capabilities in its supply chains stimulating other industries

to do the same. This fact motivated the authors of the present paper to use this industry in the study of SCM capabilities. The goal of this paper is to analyze how the major trends acting in the automotive industrial segment impact the supply chains of this segment through the development of SCM capabilities.

## IMPACT OF GLOBALISATION ON SCM

The automotive industry is one of the most global industries amongst all the industries in the world. The automotive industries are always at the forefront of establishing the global infrastructure. They will be faced by many challenges at global level. In order to earn huge profits and to successfully build and expand their existing infrastructure at the global level they will have to make an efficient and smart supply chain keeping future market in mind. In the globalised markets other industries will also try to earn a good status and profits at global level and so automotive industries will get high competitions from other industries also. Also as the companies will try to join the global markets and for that they will globalize their existing infrastructure. They will be faced by operational issues in the form of quality and delivery reliability. These two operational issues will be the top challenges for entire automotive companies. With the existing supply chains the companies are not getting those benefits and profits which they have anticipated from their global supply chains. In future the globalization will increase. According to the market research data it was estimated that only one third of the automotive companies supply chains have improved their overall performances as result of globalization and their profits were also improved accordingly. In contrast near about 70% of the top supply chains have reported that because of globalization the overall performance of the companies has been improved. In addition to it now they are trying to make important factors such as delivery reliability and quality issues under their control and they expect that they can completely get hold on these issues in years to come. In future the top concern for the automotive

companies will be more advanced business issues like regulatory and legal challenges of the international supply networks and the cultural and organizational level obstacles which will result because of increasingly virtual relationships. To achieve a global status the focus of automotive supply chain should be on integrating their global chains. This will include integrating the product life cycle management and enterprise resource planning for its partners. Also apart from it they should use tools such as collaboration, sharing of knowledge and social networking because they will help them to remove distance gaps and will make people networks across the extended value chains. To support integration a smarter supply chain should establish common terminology and process.



**Fig: 1: An Overview Of the supply chain management of an automotive industry.**

The supply chain should be such that they should not run each facility separately instead they should manage the resources globally by matching the demands with manufacturing capacity and sourcing around the world. These supply chains should use intelligent business analytics to track and synchronise demands and supply trends, evaluates complex scenario and acts based on the most likely outcomes. This insight along with the supply chain flexibility allows the smarter supply chains to adjust sourcing and production planning to optimize the operations globally.

**SCM CAPABILITIES**

The literature lacks a precise and standard definition for the notion of capability (Duysters & Hagedoorn, 2000; Hafeez et al., 2002). Occasionally, they overlap with the notion of competence. For the authors of this paper, capabilities guarantee leading edge to organizations in static markets. Competence, on its turn, allows the organization to sustain its capacity whenever changes threaten the market. For example, when of the invention of automobiles at the end of the XIX century, superior capabilities in the production of carts were not enough to save the market of carts.

Although manufacturers of carts sustained its capabilities, they lost their competitive advantage in an extremely changing environment.

In the literature, SCM capabilities include, among many others, speed and reliability in delivery, capacity of meeting the needs of target markets, and low distribution cost (Evans & Danks, 1998); relationship and cooperation among members of the chain, and knowledge of the market in which the chain operates (Min & Keebler, 2001); suppliers' reliability, delivery lead time, reliability in business processes, and complete orders (Lummus et al., 1998).

**LITERATURE REVIEW**

In this paper, a review of the literature is presented. This follows the formulation of the hypotheses.

Buyer-Supplier Relationships - For the effective management of a supply chain, the buyer-supplier relationship has received increased attention during the past few decades. Many authors have discussed the issues, which contribute to the improved buyer-supplier relationship. For example, Daugherty et al. (1992) found that higher level of shared information and communications among the supply chain partners lead to improved collaboration and greater responsiveness in the supply chain. This observation is supported by many more researchers who observed that an information sharing mechanism among the partners of a supply chain is essential for the smooth functioning of these relationships (Ellram 1995; Nielson 1998; Ballou et al. 2000).

However, in most cases, one partner in a supply is so dominating that it may unilaterally dictate its own terms and conditions to the other partners. The major stakeholder in the supply chain may take some of the decisions at its own and forces the smaller partners to comply with these decisions (Munson et al. 2000). However, such dictatorial attitude can also be used in achieving cooperation among the organization. In that case, the dominant partners may help improve the cooperation in the supply chain (Ballou et al. 2000). Top management of the supply chain organization can play an important role in developing policies, which may lead to a healthy and collaborative relationship between the buyers and the suppliers (Andraski 1998; Akkermans et al. 1999; Kilpatrick & Factor 2000; LaLonde 2000). Further, the belief and commitment of top management in SCM practices (such as improved buyer-supplier relationships, information sharing, etc.) is a key component for the successful adoption of SCM (Higginson & Alam 1997; Moberg et al. 2002). These observations lead to the formulation of the hypothesis 1.

Hypothesis 1 -

The buyer-supplier relations in an organization are significantly improved by (i) information sharing, (ii) commitment of top management, and (iii) attitude of major stakeholder of the supply chain.

Inventory Management - Inventory reduction is one of the main objectives of SCM (Pagel 1999). It is also the most commonly shared data among the supply chain partners (Lee & Whang 2000). Therefore, several researchers have explored the ways to reduce the inventory in a supply chain. Many researchers (Kwan 1999; Pagel 1999) have noted that information sharing in the supply chain can play an important role in reducing the inventory level as it allows the companies to quickly respond to market changes thus requiring minimum inventory across the supply chain. Earlier, Loar (1992) examined the relationship between inventory levels and the information sharing in four major US industries. He observed that average inventory level had an inverse relationship with the frequency and volume of information sharing. However, besides information sharing there are some other enablers of inventory reduction in a supply chain, e.g. postponement of point of product differentiation (Metz 1998), reduction of suppliers base in the supply chain (Pagel 1999; Szwejcowski et al. 2001), and reduced order fulfillment time (Mohanty & Deshmukh 2001). Regarding order fulfillment, Sahay et al. (2003) observed that it was the second most important supply chain issue in Indian companies. Companies were paying maximum time and attention to improve order fulfillment.

#### Hypothesis 2 -

Inventory reduction in an organization is influenced by (i) order fulfillment time reduction, (ii) reduction in supplier base, (iii) postponement of point of product differentiation, and (iv) collaborative information sharing. Each of these attributes has different level of influence on inventory reduction.

Integration of a Supply Chain - Many enablers support the integration of a supply chain. Information technology is one such enabler, which has received attention in the literature (e.g., Lee & Whang 2000; Li 2002). However, use of IT in a supply chain and as a result of that integration of a supply chain is subjected to some barriers such as disparity in trading partners' ability, fear of information system breakdown, and low level of supply chain integration (Kwan 1999; Kadambi 2000; Ayers 2001; Li 2002 etc.). It is aimed here to identify the barriers that significantly influence the supply chain integration.

### TRENDS IN THE AUTOMOTIVE INDUSTRY

This section presents the major trends that have been impacting the management of supply chains in the automotive industry. The main trends identified in our research were: business orientation change in the supply chain; globalization; outsourcing; rationalization and the reduction in the number of suppliers;

development of new materials; life span of vehicle models; and adoption of world platforms.

Business orientation change in the supply chain - The automotive industry has been undergoing major changes in business orientation as far as the supply chains are concerned. This orientation is stopping from being pushed by OEMs to be pulled by the final customer (Holweg & Miemczyk, 2003). The traditional mass production model, aligned with the push orientation, has been revised and has been giving place to the Build-to-Order (BTO) model, typical of a pull orientation (Burt, 2000; Agrawal et al., 2001).

Globalization - We share Hill's (1998) understanding of globalization, according to which the term refers to changes toward a more integrated and interdependent world, where commerce, finance, markets, and production are not locally outlined anymore.

In the automotive industry, globalization has been strongly influenced by the saturation of markets in the triad region (Western Europe, Japan, and North America) and by the potential of growth of markets in developing countries (Humphrey et al., 2000).

Outsourcing - Outsourcing is a practice in which part of the set of products and services used by a business organization is executed by another business organization, in a cooperative and interdependent relationship. The contemporary view of outsourcing goes far beyond the practices that have been labeled as sub-contracting. Essentially, outsourcing means an option for a relationship that involves partnership and complicity with one or more suppliers in the productive chain, typically a strategic decision, which is comprehensive and difficult to be reversed (Pires, 1998).

### CONCLUSION

The findings of the study contribute to the body of literature on SCM. The hypothesized findings not only validate some important and widely discussed aspects of SCM but also set out interrelationships among many of these aspects. In regression analysis, used for testing the hypotheses, the relative importance of each variable is obtained.

In future the landscape of automotive industry will be exposed to a set of critical challenges. There will be more complexities due to increased globalization due to which there will be many new challenges will emerge in the automotive industries and hence they will have to overcome these complexities and find new ways to create profits if they want to prosper. In coming years the environment will be highly competitive, hence the need of an effective and efficient global supply chain will become a necessity for automotive industries. This can be done by optimizing their existing supply chains and infrastructure and building an efficient and more effective supply chains and strategies which will earn

them good market position and status even in a highly globalized markets.

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