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An empirical study on growth of supply chain management in Toyota Motors

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Abstract: The objective of Toyota Motors is to improve its competitiveness by application of integrated supply chain management. ISCM helps to reduce the operational cost and brings better inventory management. There are network of companies involved in decision making and information flow which includes distributors, suppliers, customers and agents. The objective of this paper is to study the application of integrated supply chain management in Toyota motors. The data is collected on the basis of both primary and secondary data analysis. The primary data was collected by interviewing the individuals involved in supply chain of Toyota motors. The secondary data was collected from literature review. The method of analysis is descriptive qualitative analysis. This study concludes that Toyota should focus on market demand rather than new product development of a quality product and forcing it to market to purchase. It should focus on integrated supply chain management to improve its operations.

Key words: Supply chain management, distribution, integration, production planning, inventory management, vendors

I. INTRODUCTION

This paper covers the issue of supply chain management and suggests the solutions to those issues. The concept of supply chain management is explained in this paper taking example of Toyota Motor Company. This paper covers the supply chain management process of Toyota and issues faced by it. It also provides suggestive recommendation to the company.

II. ACADEMIC LITERATURE REVIEW

A. Description of supply chain management

Supply chain comprises of activities such as production, operation, procurement of material, transportation and distribution. Supply chain management involves coordination between these activities, integration between process and partners of supply chain. The partners of supply chain are vendors, information service provider and third party companies. The varied activities of supply chain management can be broadly classified into inbound and outbound activities (Pagell and Shevchenko 2014). These includes activities such as sourcing, procurement, transportation, inventory management, warehousing, production planning, forecasting and scheduling, customer service and order processing.

B. Significance of supply chain management

In this competitive environment, organization wants the product to reach end consumer quicker. To fulfil this objective, there is a requirement of improved supply chain management (Seuring 2013). If the product reaches the end consumer quicker, it ensures the availability of your product over your competitor's product, selling of more number of products and increased market share.

The functions of supply chain management are described below-

- Inventory management
- Transportation management
- Material management
- Inbound transportation
- Warehousing
- Customer service
- Order processing
- Budget forecasting
- Invoice payments
- Forecasting sales
- Production planning

C. Objective of supply chain management

The objective of supply chain management can be summarized as follows (Dekker et al. 2013)-

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- Decreasing working capital requirement
- Taking off assets from balance sheet
- accelerating cycle of cash
- increasing the turns of inventory

D. Principles of supply chain

The principles of supply chain can be summarized as below (Ross 2013)-

- Segmentation of customer – supply chain management believes in segmentation of customer on the basis of their service needs
- Customized network of SCM – the network of SCM is formed on the basis of need and profitability of customer.
- Analysing market demand – entire chain of supply chain can help in forecasting the demand and change in demand of the market. It helps in determination of sales and allocation of resources.
- Differentiated product – the demand of consumer is varied in the segment of car and manufacturing differentiated products require different inventory and reduces the chances of economies of scale.
- Managing source of supply – the supply chain management leaders' work closely with their key suppliers to ensure the flow of quality raw materials and components.
- Selecting channel of supply – the channel of supply chain is selected on the basis of ease to monitor and control the supply of material.

E. Expected outcome from supply chain management

Supply chain management provides value and profitability to shareholders. Every aspect of business of supply chain practice focuses on improving efficiency and reducing cost (Beske Land and Seuring 2014). The benefit of supply chain management are increased revenue, decreased cost, enhanced efficiency and utilization of resources, better service of customer, etc.

The five areas where supply chain management has direct impact are –

1. Profitability

Supply chain ensures the assembly of resources in correct order which supports new product development and after sales service leading to growth in profitability. Efficient supply chain contributes to around 5% growth in profitability.

2. Working capital

Increasing the turn of inventory, managing receivables and payments, inventory management and accelerating cycle of cash management are also influenced by supply chain management. This will result into reduced cash cycle and reduced requirement of working capital.

3. Fixed capital

The right number of warehouse and function of outsourcing reduced the requirement of fixed capital by the company.

4. Tax

A company operating in global market has to deal with issues such as price transfer, assets, taxes and custom duties.

5. Cost

The major focus of supply chain is towards daily expenses of resource procurement and allocation, process designing and outsourcing.

III. DESCRIPTION OF COMPANY

Toyota Motor Company is the third largest manufacturer of automobiles in world in terms of volume of production and is the second largest company in terms of revenue. The target of Toyota is to become number one automobile company in world. It is employing around 4 lakh people around the world. The mission statement of Toyota is to leading in the path of mobility by providing safe and reasonable services to its customer through constant innovation, respect, quality improvement and fulfilling customer expectations. To meet this objective, Toyota has a team of passionate and talented employees.

IV. DESCRIPTION OF SUPPLY CHAIN MANAGEMENT

Supply chain management is the management of all the activities of supply chain to add value to customer and gain competitive advantage. The activities of supply chain include development of product, its sourcing and production, and logistics. Supply chain management involves coordination of these activities. The core idea behind supply chain management is that the product reaching end user is the collective effort of all the members in supply chain and an organization shall pay attention to the activities of entire supply chain. Supply chain involves flow of both information and physical item (Lu and Swaminathan 2015). Physical flow involves movement, transformation and storage of product and services. They are tangible part of supply chain. Information flow involves the coordination between

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members of supply chain in relation to planning and updating the flow of product and services. It is intangible part of supply chain.

V. SUPPLY CHAIN MANAGEMENT IN AUTOMOBILE INDUSTRY

The supply change management in automobile industry is dynamic and complex as the global environment is constantly changing. Companies in automobile industry are required to ensure the flow of material and money in supply chain is in right direction (Christopher 2016). The automobile industry is in growth phase and facing various challenges related to supply chain such as recalls, inventory management, manufacturing and distribution.

The figure 1 provides a description of structure of supply chain in automobile industry. According to figure 1 the supply chain in automobile industry can be divided in three levels – 1. OEMs (original equipment manufacturer) 2. First tier suppliers and 3. Second tier suppliers. The focus of OEMs is towards services and parts and rest work they outsource. First tier suppliers produce from major systems to individual parts. Second tier supplier provides components to first tier suppliers.

The key issues faced by automobile industry with respect to supply chain management are over-stocking or under-stocking of inventory. Since, the automobile industry is in growth phase, the companies have pressure to meet the demand and increase volume of production. This has led to shortage of resources in industry. The second issue is the issue of recall which is faced by automobile industry which has led to loss of revenue by various companies (Stadtler 2015). Many companies have re-engineered their supply chain and operation to avoid this issue. The third challenge faced by industry is the volatility of market demand. The market has varied demand in respect to type of car and preference for brand.

VI. SUPPLY CHAIN MANAGEMENT IN TOYOTA

The supply chain management of Toyota is explained under following heads –

1. Suppliers

The suppliers of Toyota are divided into two functional tiers – first tier of suppliers which is product development team and second tier of suppliers which make components. There is a high degree of coordination between the members of first tier supply chain management. Thus, the new product development in Toyota is least lead time. Toyota believes in technological development throughout its supply chain (Monczka et al. 2015). Even it transfers the senior manager or top management executives at the position of their suppliers. Thus, suppliers of Toyota have insight of functioning and operation of Toyota.

The strategy of Toyota is to maintain long term relationship with its suppliers and depends upon only one supplier for one component. This enhances the collaboration among supply chain management members both horizontally and vertically. The second strategy followed by Toyota is operating at minimum cost and pricing of product by market price minus concept (Jacobs and Chase 2013). Thus, it decides the prices of its product on the basis of value perceived by customers. Suppliers of Toyota believe in the concept of smooth production and maintain the supply of components as per the volume of business.

2. Procurement

Toyota partners with its supplier in terms of both operation and function. Toyota considers suppliers as integral part of their company. The suppliers of Toyota lie within a circumference of 56 miles radius. It gives them the security of continuous supply of components and materials leading to economies of scale and reduced cost (Fawcett Ellram and Ogden 2013). Toyota does not select its suppliers on the basis of lowest bid but it believes in creation and development of its suppliers. It even trains its suppliers if required. It even gives importance to efficiency in packaging and transportation. It even constantly reviews the route of transportation.

3. Supplier relations

Toyota has a supplier partnership hierarchy. Toyota develops and implements the levels of responsibilities at each tier of supplier with limited time and cost. The approach applied by Toyota is JIT (just-in-time). The supply chain management of Toyota is flexible. It applies practices to make optimum use of its resources, time, money, assets, human resource to improve efficiency and productivity (Wisner Tan and Leong 2014). The philosophy of Toyota is called as lean management. This has helped Toyota to reduce cost and improve quality. Toyota ensures close relationship with its suppliers. The suppliers have freedom to select their design. The suppliers of Toyota further depend on other suppliers for components. The whole chain has managed the relationship between buyer and supplier.

4. Manufacturing

The production system at Toyota is lean production system (Refer figure 2). The prime focus of Toyota is customer and its strategy is pull strategy. The production layout of Toyota is cellular layout. The objective of manufacturing at Toyota is to reduce waste (Brandenburg et al. 2014). The basic characteristic of lean production is to reduce the cost of waste and repair. Apart from this, Toyota applies the concept of 'six sigma' for quality management. The result is production of end product at low cost and high quality.

5. Distribution

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There are three ways or principles to manage the distribution at Toyota. Toyota gives complete freedom of choice to its distributors. It supports its dealer in making right investment decision (Mangan and Lalwani 2016). Toyota believes in concept of joint growth and development with its dealers.

VII. PROBLEM IDENTIFICATION

Description of supply chain issues identified in the case are as follows-

1. Globalization of operation of manufacturing

With globalization, there is a need of globalization of manufacturing and procurement operation of supply chain management (Christopher 2016). The challenge is to select a supplier between best quality provider around world or local supplier.

2. Quality and safety of product

The challenge for Toyota is to produce product of high quality and safety. The number of product recall cases in automobile industry is increasing (Schaltegger and Burritt 2014). It damages the reputation and cost of the company.

3. Less inventory, shorter lead time and better output

Toyota is focused on lean manufacturing to face the challenge of changing demand of market and shorter life cycle of product. Toyota faces challenge to align its operational strategy with lean strategy (Ross 2013). Thus, the challenge can be summarized as successful implementation of lean manufacturing strategy.

4. Consolidation of supplier base

There are many advantages of supplier base consolidation. It removes the vacancies and overheads of supply base (Rushton Croucher and Baker 2014). The challenge faced by Toyota is to select a supplier with experience in solving problems.

5. Access to latest technology

The challenge faced by Toyota is frequent gradation in technology which affects the new product development.

VIII. POSSIBLE SOLUTION TO TACKLE ISSUES

1. Globalization of operation of manufacturing

There are around a choice of more than 60 locations for service and 30 centres for logistics. Thus, Toyota has wide choice to select a supplier from global world rather than depending on local supplier (Martínez-Jurado and Moyano-Fuentes 2014).

2. Quality and safety of product

Toyota can ensure high quality and safety by selecting high quality raw material and correct process of production and international quality standards. The lean production system of Toyota is flawless and assures quality (Michna et al. 2016).

3. Less inventory, shorter lead time and better output

Toyota can use value stream analysis (VSA) to ensure the optimization of production process and service design at lower cost and increased productivity (Holman et al. 2014).

4. Consolidation of supplier base

Toyota can implement software for central point to place orders automatically to supplier base on regular intervals.

5. Access to latest technology

Employee should be train for technical know-how and fasten in the use of technology. Toyota should implement the technology which is safe and durable in a continuous technology changing environment.

IX. RECOMMENDATIONS

Toyota should focus on market demand rather than new product development of a quality product and forcing it to market to purchase. The just in time approach applied by Toyota helps it to respond quickly to the needs of the market (Govindan et Al. 2014). It results into improved response, efficient customer relationship management and inventory management. Toyota can implement a four step approach of integrated supply chain management –

The vital decision in supply chain management is the decision related to select distribution centres. It is selected on the basis of proximity to market, holding capacity, location and EDP system. The four steps of integrated supply chain management are –

- Analysis of potential sources
- Study of concept
- Planning
- Project management

The ways to improve supply chain management at Toyota is as follows (Coyle et al. 2016)-

1. Automatic buying process

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The vital part of supply chain management is inventory management. There are various ERP solutions for supply chain management which will make the process of purchasing automatic. It is an automatic system to generate the order as the inventory goes down to a certain level. It will always maintain a certain level of inventory in organization.

2. Standardization

The success of supply chain management depends upon making the process standardized. It will save both time and money. It will be easy to use and handle by employee. It reduces the chances of miscommunication and encourages accuracy and team work.

3. Transparent operations

The problems of mistakes, wastes and repair in supply chain can be reduced by implementing ERP solutions. ERP solutions will make the system transparent, manage inventory and reduce cost of loss.

4. Data management

The decision making related to supply chain management depends upon timely and accurate information. The ERP solutions will manage the data and provide information on time and accurate. Any information related to purchase, inventory and production can be accessed through ERP solutions.

5. Inventory management

ERP solutions provide flexibility to inventory management, reduced paper work and quick decision making. It saves both time and money.

6. Monitoring performance

For smooth functioning of supply chain, it is important to monitor the performance of supplier in terms of rates of mistakes and cycle time. It can be done easily with the help of ERP solution.

7. Reduced cost

There are various factors of supply chain which are uncertain and beyond the control of management. There is a requirement to continuously analyse the external environment to identify the potential threats. It will help in reduction of waste and cost.

8. Improved outcome

Effective supply chain management reduces the chances of re-manufacturing and re-process. It helps in management of reducing waste and identifying problem related to products.

9. Just-in-time

Toyota has implemented the approach of JIT manufacturing and inventory which has resulted in successful achievement of reduced cost and increased efficiency. It has helped in maintaining required level of inventory in warehouse. It is a suitable approach to be followed by Toyota.

10. Coordinating with other departments

Supply chain management requires managing with other departments of organization such as purchase department, finance department, sales department and production department. All these departments can be integrated using single ERP solution.

X. CONCLUSION

Supply chain management involves coordination between these activities, integration between process and partners of supply chain. In this competitive environment, organization wants the product to reach end consumer quicker. To fulfil this objective, there is a requirement of improved supply chain management. The supply change management in Toyota is dynamic and complex as the global environment is constantly changing. Toyota required ensuring the flow of material and money in supply chain is in right direction. Toyota is in growth phase and facing various challenges related to supply chain such as recalls, inventory management, manufacturing and distribution. Toyota should focus on market demand rather than new product development of a quality product and forcing it to market to purchase. It should focus on integrated supply chain management to improve its operations.

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ANNEXURE

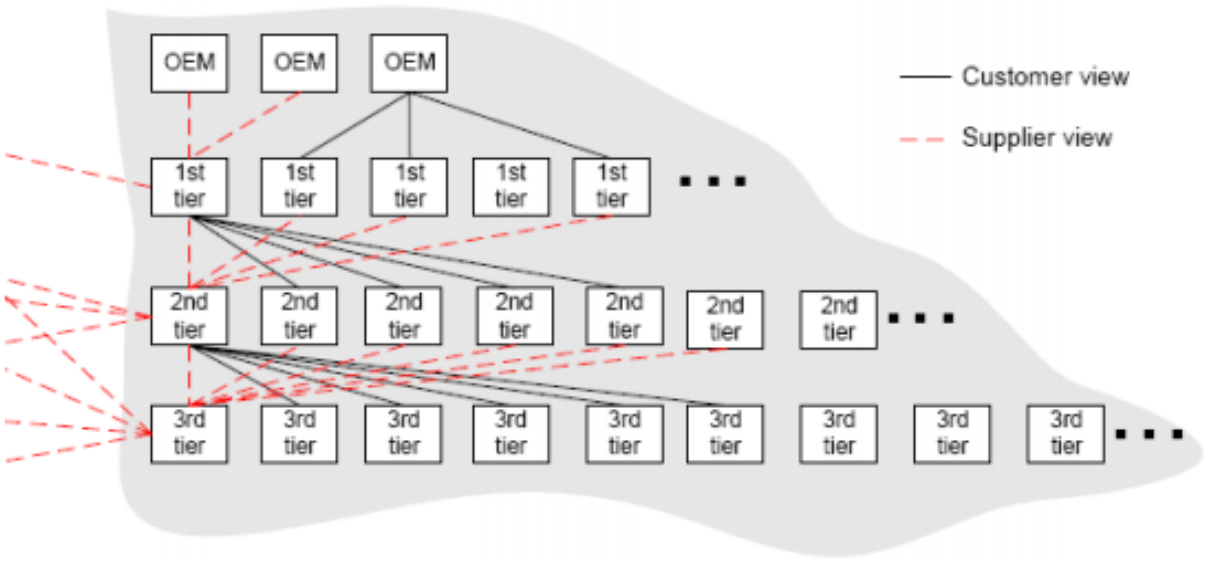

Figure 1 – Structure of supply chain in automobile industry
Source- Morell& Phelps 2000

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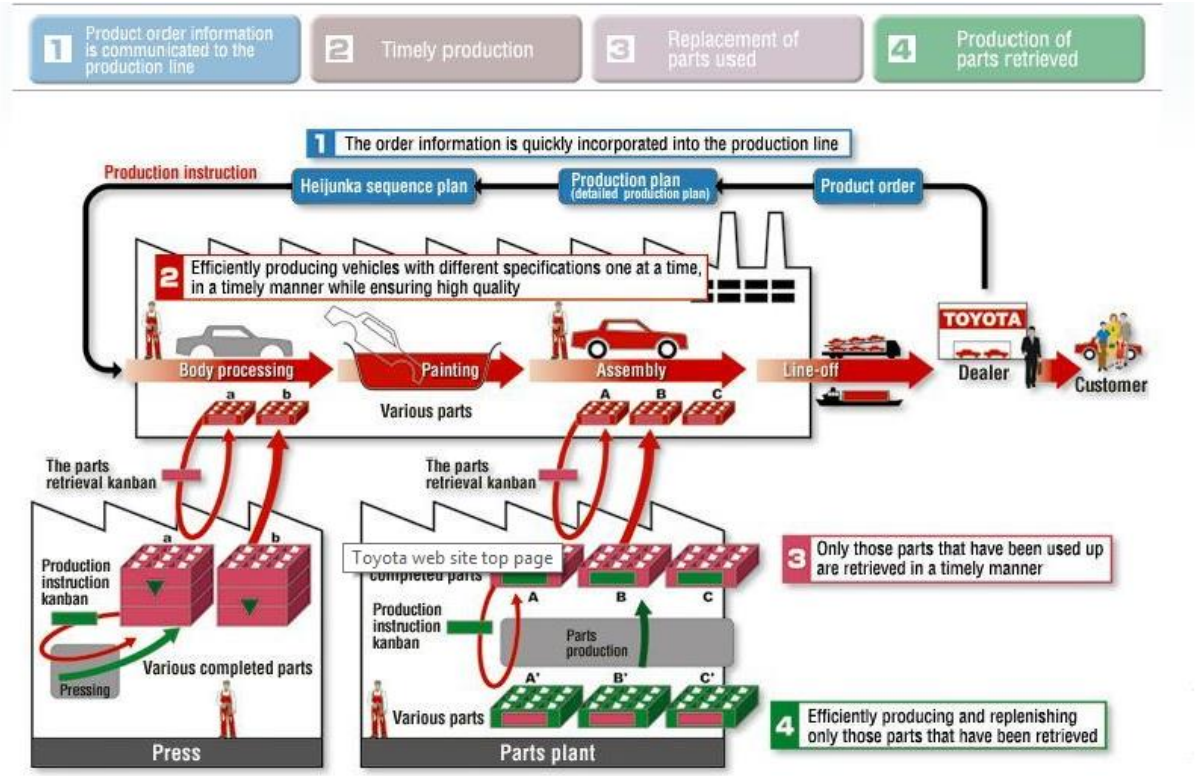

Figure 2 – Production system in Toyota
Source- Toyota – Illustration (n.d.)

