

# Operation and supply chain management on tata motors



## **Introduction:**

We can see remarkable amendments in the manner that organisations do business. Organisations are functioning in a highly changing and economical environment. To work successfully in any business environment, organisations require to become much more involved in how their suppliers and customers do business. Due to expansion in global markets and competitions, organisations have to pay much more attention about what kind of products and services customers are looking for. To make that products and services available to their customer organisations have to pay close attention to where materials come from, how their suppliers design their products and services, how they are transported and stored and what their direct consumers and end-product users are really looking for. Supply chain management is “ the design and management of seamless, value-added processes across organisational boundaries to meet the real needs of the end customer.” (The Institute for supply management In Wisner, Tan and Leong, 2008, p. 8). Supply chain management covers whole procedure till final product get in to consumer’s hand i. e. from providing raw materials till final product reaches to end product consumers. The main intension of supply chain management is to how organisations make use of suppliers process, technology and capability to increase competitive advantage.

In this report we are going to explain about supply chain management of one of the leading Indian Automobile Industry. Indian automobile sector is growing rapidly with beating economic growth rate of 8. 4% in the year 2005-06. Global automotive companies are constantly restructuring their business activities by outsourcing their non-core activities to low cost

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countries. In view of current competitive environment automobile manufacturers are expected to innovate new features in their products and process as well as to follow environmental standards along with economical cost. Due to this organisations are forced to source more components from low-cost countries.

Due to competitive environment automobile companies are getting engaged in mergers and acquisitions. They are facing challenges in improving their quality, cost reduction and developing time to market. Because of this reason, the automobile industry has been passed through major structural and other changes in last decade. The relationship between automobile assembler and their suppliers is changed due to current globalisation, implementation of lean production and development of modularisation.

Figure 1

All these factors help organisations towards product separation by reducing cost of Research and Development, innovative sales, marketing approaches, rising focus on enhancing effectiveness in production and supply chain. Therefore during the days of e-business and outsourcing, supply chain management plays a vital part in automobile sector.

Figure 2: Typical model of Automobile Supply chain

Tata Motors (TML) is India's leading automobile manufacturer, which is established in 1945. It is amongst the top 5 manufacturers of commercial vehicle in the world. TMS is largest Indian automobile company with consolidated Revenues of Rs. 92519 crores (USD 20 billion) in 2009-10" (www.

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tatamotors. com). It has employed around 24000 employees. Manufacturing base of TML is spread around various Indian states. TML is not only limited up to Indian market, it has also started expanding its footsteps into international market. Today Tata Motors is a global player having markets in several countries around the world including Europe, Africa etc. In 2008 TMS has purchased British car companies Land Rover and Jaguar and in 2004 South Korean 2nd largest truck making Daewoo Commercial Vehicle Company. TMS is the first company to be listed on New York Stock Exchange from Indian engineering sector. TMS has recently released Tata Nano which is lowest price car in the world. (www. tatamotors. com)

Tata Motors dealing in wide range of vehicles such as passenger cars, utility vehicles, Trucks, Commercial passenger vehicles as well as defence vehicles.

The main competitors of automobile company such as Tata Motors are the large manufacturer of commercial and passenger vehicles in India who are, Ashok Leyland, Eicher Motors, Swaraj Mazda, Mahindra and Mahindra etc.

Valuable tools, models and theories will give a detail understanding of issues dealing with supply chain management. Theory around the issues of operation management, supply chain management, porter's five forces, the four V's and value chain will give a through insight of the value added in the product and services. Therefore, an analysis of all above will follow, focusing on the Indian Automobile Industry.

## **Operation Management:**

Each organisation has to make the product or service available, that their end-

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organisation, which produces products or services. Operation management always deal with the main purpose of the business which is, to produce products and services. Operation management is “ Planning, scheduling and control of the activities that transform inputs into finished goods and services” (Bozarth and Handfield, 2008: 7). The general transformation process model shows importance of operations, which can be seen as a transformation process that takes a set of inputs and transforms them into outputs (Cowe et al., 2008; Bozarth and Handfield, 2008).

### Figure 3: Typical Transformation process model

In the case of Tata Motors inputs of organisation are raw materials such as seats, steering, clutch pads, etc. which will help to produce or assemble car, information such production process, People such as engineers, designers who will help to design and assemble car, facilities and machinery for the production and assemble different parts of the car. The transformation process includes manufacturing and service operations which is must to change inputs in to outputs which are different types of automobiles such as, car, bus, truck etc.

#### INPUTS

Raw materials

(seats, steering, clutch pads etc.)

People (Engineers, Designers etc.)

Facilities and machinery/equipments

## TRANSFORMATION PROCESS

Manufacturing process

Service operations

## OUTPUTS

Cars, buses, trucks, army vehicles etc.

Figure 4: Transformation process model for Tata Motors.

Even if above view point of the process might be use throughout the organisation, it is not necessary that it should be follow in the same manner all the time. There are variations in the processes which need to be considered. Four characteristics of demand which are known as 'four V's' processes which affect the method of processes which required to be managed. The four V's are Volume i. e. how many products or services produced via operations, Variety: how many different types of products or services produced by operations, Variation: amount of level of demand changed over time and Visibility: amount of visibility of its processes to its customers. The operation management process might need to be differentiate depending on effect of above four V's. Four V's dimensions are important in assuming how easy it is for operation management to operate at low cost.

Volume: In terms of Volume Tata Motors is high. Volume stands for number of productions or services via operations. As a huge company in automobile industry volume of production of vehicles through operations is high.

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**Variety:** In terms of Variety Tata Motors is medium to high. Variety stands for different types of products or services produced by the operations. As a largest Indian automobile company Tata motors is manufacturing wide range of vehicles except two wheelers and luxurious cars. They are mainly deals in different kinds of commercial vehicles, passenger vehicles, army vehicles etc.

**Variation:** In terms of Variation Tata Motors is Medium to low. Variation stands for amount of level of demand change over time. Demand for the Tata Motors vehicles are predictable. Therefore it is easy for the operations to produce the products or services according to demand however if there is any change in demand over time Tata's operations are able to meet such change.

**Visibility:** In terms of Visibility Tata Motors is medium to low. Visibility stands for amount of visibility to its customer. It is unlikely that whole process is visible to its customer however up to certain level it is possible for e. g. Via internet or phone ' track and trace' facility customer can have visibility of where their order is or they can check the availability of products. Thus visibility of processes is low to customers compare to dealers or agents in Tata motors.

Above stated 4 V's can be reviewed in figure given below.

Low repetition each staff member performs more of the job less  
systemization high unit costs

Flexible

Complex

Match customer needs

High unit cost

Changing capacity

Anticipation

Flexibility

In touch with demand

High unit cost

Short waiting tolerance. Satisfaction governed by customer perception.

Customer needed received variety is high. High unit cost

Time lag between production and consumption

Standardized

Low contact skills

High staff utilization

Centralization

Low unit costs

Well defined



Routine

Standardized

Regular

Low unit costs

High Variation Low

## **In Demand**

High Validity Low

Stable

Routine

Predictable

High utilization

Low unit costs

Low Volume High

High Variety Low

High repeatability

Specialization

Systemization

Capital intensive

Low unit costs

(Source: Cowe et. al, 2008: 174)

Figure 5:

Now we will look at the organisation by applying porter's five forces. They are very important to measure strengths and weaknesses of any organisation deeply and they can also be very helpful for strategy development of any organisations. As per Porter, capacity of any organisation largely depends on threat of new entrance, bargaining power of buyers, bargaining power of suppliers, threats of substitutes and rivalry amongst current or existing competitors. The above mentioned five forces have a large impact on price, cost and required investment as it deals with external factors which influence nature of competition and internal factors which influence the way in which organisations compete and there how five forces relates to the profitability of any organisations.

Threats of new entrance: The investment, technology and knowledge required to set up automobile industry like Tata Motors could be big barrier to enter in such field, which stop new entrance. However Indian economy is on rise. There is lots of progress in infrastructure mainly the better roads and highways, unexpected growth in financial sectors have expanded financing options to people all around the country and especially to rural populations. Due to such available facilities Indian market is becoming more and more attractive; hence there are many possibilities of new entrance. Thus,

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probably for the automobile industry like Tata Motors threat of new entrance is high. Example: Tata Nano which is a small and cheapest car of Tata Motors. The threats of new entrance for Nano can be Suzuki global car, Reva, Bajaj's Renault, Nissan's small car, Ajanta group's small car project etc.

The Bargaining power of buyers: Various domestic automobile companies like Eicher, Swaraj Mazda, Mahindra and Mahindra as well as more than 20 foreign automobile manufacturers are selling their products in Indian market which will provide range of choice for the Indian buyers. Hence in Tata Motors bargaining power of buyer is high as variety of choice available for the customers and services they get from the manufacturer do not vary from one company to another. Though there is very least options available for the products like Tata Nano which is low cost car in the world.

The Bargaining power of suppliers: Supplier power is largely depend on number of suppliers available to any automobile manufacturer. If a particular supplier provides very essential part to make any product then they are able to charge more prices to earn more profit, where we can say the bargaining power of supplier is high. Most probably it is assume that suppliers have considerable bargaining power as they are not dependent on a single manufacturer. However in case of Tata motors we can assume that the bargaining power of supplier is low as Tata motors is operating its joint ventures in various countries around the world. They have got experience and resources available from all the regions they are operating in therefore when any cost effective variable changes they can gather information from different countries to find out subjected matter. If the price of one supplier goes up they have got option to get that product from the different supplier  
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from another region or country. Recent example: Tata motors took completely new approach to their supplier. They have just provided expected output to their suppliers and allowed them to obtain creativity with their design, materials and prices, which will probably reduce the bargaining power of supplier.

(<http://www.supplyexcellence.com/blog/2008/08/25/tata-motors-leveraging-their-suppliers-for-innovation/>)

**Threat of Substitutes:** As India is well-known for the two-wheelers threat of substitutes is high to automotive manufacturers. The another important reasons for high threat of substitutes is, various competitors such as maruti, swaraj mazda, Eicher etc. are constantly striving to enhance their market share, which increase pressure on Tata motors to innovate and compete with these substitutes. Example: If the price of Nano goes up, the person who is switching from bike to car won't move to car and will think to remain in bike.

**Rivalry among existing firms:** Rivalry among existing firms is high as there are various competitors of Tata Motors in India which are, Maruti, Swaraj Mazda, Eicher as well as foreign automobile makers which are constantly seeking the ways to be better than others. Example: Currently Tata Motors has introduced cheapest car in the world, now Many other companies (such as Ajanta group small electric car with proposed price of INR 85000) have planned to introduce cars in the same segment therefore price competition will start. Thus for the Tata Motors rivalry among existing firms is high.

**Potential**

**Entrants**

**Substitutes**

**Buyers**

**Suppliers**

**Industry Competitors**

**Rivalry among existing firms**

Threat of New Entrants

Bargaining power of Buyers

Threat of Substitute Products or Services

Bargaining Power of Suppliers

Figure 6: Five forces of Porter.

## **SUPPLY CHAIN MANAGEMENT:**

Supply chain management is one of the important and necessary function of the organisation. It concerns with flow of information as well as the flow of products and services. It is a management of relationship between operations and processes. The concept of supply chain applies to the internal relationship between processes as well as the outside relationship between operations. Overall it is a management of activities and relationship which intends to achieve maximum customer value and sustainable competitive advantage. (Cowe, 2008).

First-tier supplier

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Second-tier supplier

First-tier customer

Second-tier customer

## **Demand side**

## **Supply side**

Purchasing and supply management

Physical distribution management

Logistics

Materials management

Supply chain management

Physical flow

Information flow

End Customer

The supply chain management normally concerned with the flow of information as well as the flow of products and services.

In a supply side normally organisation send the information to the first tier supplier about their needs such as quality of material required, time limit, quantity, cost etc. Based on this first tier supplier send the relative information to second tier customer and depending on this the second tier

supplier supplies the products required to the organisation via first tier supplier.

To manage the demand side well, organisation obtain the information from the end customer of the product directly or via second tier customer and first tier customer and send it to its suppliers. So we can see that the information obtained from end customer requirement reaches up to last supplier via different channels such as, second and first tier customer, organisation, first tier supplier and so on and depends on this end customer obtains required products.

To manage whole process of supply chain, management has to consider all its stages such as supply side, product manufacturing and demand side.

Supply side in Supply chain: The potential of any process or operation is largely depended on the receivable inputs. Therefore supply management is a required for effective operations management. There are three main activities involved in supply side, which are:

Selecting appropriate supplier

Planning and controlling the ongoing supply activity

Developing and improving suppliers' capabilities.

For a smooth process or operations it is necessary to pass through all above mention activities.

Selection of supplier: One of the important activities of the supply side management is selection of proper supplier. To select the supplier first of all they have to understand the requirement of all processes within their operations as well as to understand the capabilities of the supplier, because they are going to provide products and services required for the operations. To select the right supplier most of the firm mainly take up supplier scoring or assessment procedure which makes them able to evaluate different suppliers considering the relative importance of factors like, range of products or services provided, quality of products or services, awareness, delivery and volume flexibility, cost, ability to supply the required quantity as well as their potential for innovation, willingness to share link, long term commitment to supply etc.

Another important decision of supply side management is sourcing decision which means whether to make or design component in-house (insourcing) or to get them from the suppliers (outsourcing). The next activity of supply side management is to decide source each individual product or service from single supplier or to use more than one supplier. Both single and multi-sourcing have their advantages and disadvantages.

Planning and controlling ongoing supply: Once the selection of suppliers is done the next activity of supply management is to plan and control the ongoing supply. Planning and control of ongoing supply is about ensure that the suppliers are given right information and encouragement to maintain smooth supply as well as to make sure that any internal discrepancy does not affect the suppliers ability to supply. Therefore maintenance of ongoing



process requires relative method or system set up to ensure two-way flow of information between customer and supplier.

To maintain this process well some organisations bring a degree of formality to supplier relationships by encouraging all suppliers to agree service-level agreements (SLAs) (Cowe, 2008, p. 60). Such kind of agreement covers types of issues which can disturb the ongoing supply which are, response times, range of services, dependability of service supply etc.

Developing and improving supplier's capabilities: Developing and improving supplier capabilities is an important issue in supply side management. To help supplier to improve not only enhances the service from the supplier but it may also about lead to greater supplier loyalty and long-term commitment as it helps to enhance productivity, competitive advantage as well as to build a long term supply chain competitiveness which is necessary for success of any process or operations. To improve the suppliers capabilities company can use cross sourcing. Organisation can use single supplier for the certain sectors and another supplier with same capabilities for similar part of the business. Then it can give business to each supplier based on their performance which can motivate the supplier to improve its capabilities and performance. By this way organisation can also have backup if one supplier is not able to meet its requirement it can move to another easily.

### **Practical approach of supply side by using example of Tata Motors:**

For the Automotive organisation, the main products provided by their suppliers are different automobile parts such as radiators, heat exchangers,

seating system, gear boxes etc., raw materials like steel, iron, plastic required for manufacture some parts, design, technology etc. TML mainly divide its component into two different types: proprietary design and Tata Motors design. For proprietary design sector, TML use established suppliers such as Bosch who supplies engine management system whereas for in-house parts and system design TML choose supplier with strong process capabilities who can give valuable suggestions as well as improve the designs. TML use multiple source for their supply side as they have started work with 600 suppliers and total 1800 supplier part combinations which were dropped down to 100 suppliers. TML prefers to go for long term contract instead of annual contract which helps them to low down their cost. About 75% of their components are from single source whereas about 90% of total cars are being outsourced.

(<http://tatacars.blogspot.com/2008/01/tata-nano-oem-supplier-relationship.html>)

In 2001 TML have understood that dropping cost was only the option for their existence. To drop cost they have adopted entirely new approach to their supplier relationship. Instead of following typical model of supply chain they have simply given the outputs they expected and allowed their supplier to get creative with their design, materials and prices. Thus TML is being innovative to their supplier relationship to obtain desired goals.

### **Manufacturing products:**

Manufacturing division can be divide in two parts. Such as the operations which produce products, is tangible whereas operations which produce

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services their output is intangible. However most of the operations produce mix of tangible and intangible (Cowe et al., 2008). For automobile organisation like Tata Motors produce tangible output such as commercial vehicles, passenger vehicles, certain parts of automobiles etc. along with intangible output such as information for safe drive, fuel save, end of life vehicle process as well as other services provided by the organisation to their stakeholders.

In automobile sector launching new model normally takes 3-5 years from initiation to assemblage. First of all manufacturer try to assume what would people like to drive after few years, then after they design automobile which suits to people's choice. Afterwards designer prepare the basic drawings which helps to see appearance of proposed vehicle. Based on this they make the clay model which can be studied by the styling experts and engineer. Once its been pass through all the stages for review and acceptance & tool designer gives the permission to make tools that will manufacture the parts of the new model.

Figure 7: manufacturing Plant of Tata Motors.

The manufacturing process of Tata Motors based on 5 shops such as, Machine shop (Transaxle) where Exhaust manifold, Intake manifold, gear box casting, gear are produced in machine shop. Heat treatment is also done for gears and other parts. This plant is equipped with latest CNC machines.

Engine shop: Engine works as a heart for any automobile. Here five important C's (necessary parts) of engine are received from machine shop

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and assembled with other components. Before the assemble engine is ready to dispatch to final assembly line, they test the engine on engine test beds where RPM, power and torque is checked.

Press shop: Here in this shop they make different body panels required to make the body of automobiles. Some skin panels are made in this shop whereas other panels are made by vendors. Here pick and place robots are being used to move part from one station to another station.

Transaxle

Materials

Offices

Company

House

Engine

Press

Welding

Paint

Final Assembly

Figure 8: Manufacturing Plan Layout

**Weld Shop:** To make the body of the car skin panels from press shop and other panels from vendors are welded in this shop. Generally spot welding operations is carried out in weld shop. To move the jobs from one station to another they normally use hoist and tackle or by lift and carry arrangement.

**Paint shop:** Here they remove the dust and oil deposition from surface of the car body which is transferred from weld shop. Once this is done they pass car body through Cathode Electrode Deposition (CED) bath and afterwards they apply final colour to the car body according to production plan.

**Trim cum Chasis fitting:** Final assembling of the car is carried out in this section. Transmission setup from engine shop and painted car body from paint shop are received here for assembling as well as other accessories such as seat, wheels, window glass etc. are also fitted in this shop. Once all this done totally manufactured car comes out from this shop which is ready for test and inspection.

(<http://www.indiastudychannel.com/projects/4754-Tata-motors.aspx>)

([http://www.tatamotors.com/our\\_world/manufacturing.php?ViewID=2](http://www.tatamotors.com/our_world/manufacturing.php?ViewID=2))

### **Demand side in supply chain:**

All the organisations or supplier has to manage two types of demands, one is dependent and another is independent demand. The management is highly depended on certainty of demand. If the demand is assumable it is called as dependent demand. This kind of demand is assumable because it is depended on the particular factors which are predictable as well, which allows suppliers to make plan to meet demand in a systematic manner.

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Thus, in dependent demand supplier can assume the demand and work accordingly. However independent demand is unpredictable because such kind of demand is not dependent on visible factors. Therefore suppliers are often required to supply demand without having any visibility of customers order.

Logistic management is “ that part of supply chain management which plans, implements and controls the efficient forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers’ requirements” (Bozarth and Handfield, 2008, p. 363). Logistic means moving products to the customers. It includes transportation, material handling, packaging, inventory management, warehousing, information system etc. Any organisation heavily depended on all above as organisation’s cost, flexibility, delivery performance greatly depends on its logistics. (Bozarth and Handfield, 2008, p. 363)

In a global market, organisations are heavily depended on their logistic management in order to gain competitive advantage as well as to stand forward than rivals. Number of organisations thinks to outsource their logistics to third party providers, which vary in terms of range and integration of their services. In recent year logistics becomes more globalise and information-intensive. Due to development in technology, information can flow more quickly via internet which assists customers, transport companies, suppliers to track where products or goods are in the supply chain as well as where they are going next. Automatic identification technologies have also contributed in logistic management. Use of barcode <https://assignbuster.com/operation-and-supply-chain-management-on-tata-motors/>

provide visibility to the suppliers by allowing them to keep track of how many products are stored at particular location. This allows operation within the chain to co-ordinate their activities more readily as well as gives potential for cost saving(Cowe, 2008).

As Tata Motors dealing in commercial vehicles, passenger vehicles and defence vehicles, Tata Motors vehicle mainly sold to dealer, agent, businesses, army etc. They also sale their cars directly to the customers such as house holds and small businesses through company owned show rooms.

First passenger vehicle of Tata Motors was Tata India which was launched in 1998. To manage its demand side Tata motors has gone the whole hog while strengthening its dealership spread. TML was constantly trying to increase dealers as well as establishing easily accessible service points across the country to provide quality service after-sales. The company's research centre has added a number of new features to the car through constant customer interaction. They have set up four parts warehouses at suitable locations to make the genuine spare parts available throughout the country at reasonable rate. TML has also arranged service programme at Pune city in India for all service executives of dealers and outlets as well as four regional training centres. TML has also set up toll free phone number accessed from 51 cities as well as they have set up customer help lines, dealer help lines and mobile service vans in more than 50% of dealerships. To meet the demand of all tire customers they have gone a long way in providing customer service in very short time..

TML is also using infotech and internet to manage the customer and to raise its brand image. It has a special website with customer interaction facilities. The process of linking its dealers and service network is going on, which will improve the customer service level. This network will also help them to track orders from straight to the shop floor as well as greatly help in part management and delivery. They have also developed 'knowledge management system where products complains is stored for the future benefit of service network.

Thus TML has taken various steps to manage demand of all tire customers such as dealers, agents, end products customer etc and as a result of all above company has been successful in selling 100000 cars much faster than its rivals Maruti 100 and Zen & also they have been successful in overcome its shortcomings in double quick time along with customer satisfaction.

([http://www.tata.com/aboutus/articles/inside.aspx?artid= Bsjg0t0IaCc=](http://www.tata.com/aboutus/articles/inside.aspx?artid=Bsjg0t0IaCc=))

### **Value chain:**

Value chain analysis is much important for each organisation as its divide firm in to various distinct activities carry out by the organisation such as, designing, manufacturing, marketing etc. The concept of value chain is developed from accounting practices which helps to analyse the value added to organisation at every stage of manufacturing or services or marketing.

(Cowe, 2008).

The value chain involves two types of activities: Primary activities & Support activities. Primary activities change inputs (Inbound logistics, operation, outbound logistics, marketing and sales, service) into outputs and bring  
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them to customer. All these primary activities are carried out by use of support activities which are firm infrastructure, Human resource management, technology development and procurement.

Every single activity in value chain ' can contribute to firm