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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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THE IMPACT OF SUPPLY CHAIN MANAGEMENT ON AUTOMOBILE SERVICE CENTERS (PASSENGER CARS) IN INDIA AND FUTURE IMPLICATIONS

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ABSTRACT

The research was aimed at analyzing the current Supply Chain Management (SCM) techniques followed by market leaders in the servicing centers of the Indian automobiles sector and the effectiveness of SCM in the four wheeler automobiles industry. The research was also aimed at studying and investigating about the latest practices and possibilities in improving SCM in the passenger car segment of the Indian automobile industry. The methodology and tool used was a structured questionnaire which was given to the managers and staff employed in spare parts management of four wheeler automobile servicing centers to fill. The research was conducted in and around the city of Pune. For the same, 20 leading servicing centers were visited; the manager and in-charge of spare part section were contacted and administered a questionnaire for obtaining their valuable response. The service centers were found to be using digitized inventory management system and had categorized their stock according to demand namely as fast, medium and slow moving spares. Only 25% of centers were found to be using barcode system for identification and consumption recording of the spares and most of them were found to deliver the vehicles on time. Also it was found that all the servicing centers were carrying out demand forecasting based on the consumption pattern of the stock. In general, it was observed that there are three major factors most important for automotive service namely demand forecast of spares, digitization of spare management system and categorization of spares as per their movement. Emphasis on these factors will help in enhancing customer satisfaction by providing on-time delivery, reduced cost and better after sales services. This throws light on the fact that automobile service centers are trying to adapt latest technology and practices so as to reduce the cost of servicing and increasing the efficiency of manpower thereby improving total quality of service.

KEYWORDS

supply chain management (SCM), demand forecast, categorization, service centers.

INTRODUCTION

India is the third-largest automobile manufacturer in the world. The automobile industry has grown steadily since the economic liberalisation in the early 1990's. In the passenger car segment, India is the 6th largest manufacturer in the world and the 4th largest market in Asia. With the steady growth in the passenger car market, the automobile service sector has also grown multifold. Leading automobile companies like Maruti Suzuki, Hyundai, Mahindra, Toyota, Tata have been successfully earning revenues in their sales and service. These companies provide exceptional service through their company owned as well as franchisee service centres or stations. Automobile service sector is continuously evolving from its traditional methods for improving cost efficiency, lead time, optimizing cost, strategic positioning and demand forecasting techniques. This research aims to study the latest techniques followed by the market leaders in the Indian automobiles service sector, analyse the effectiveness of SCM and how it can be improved at the service centre level.

The Government of India recognizes the significance of automotive industry and it is actively involved in promoting its growth. The government's Automotive Mission Plan 2016 envisages industry to grow USD 145 billion so as to contribute 10% of GDP. Indian automobile industry especially service sector has been highly unstructured at the service centre level. The higher end of hierarchy has been evolving but the lower end is till to catch up. This research tries to understand the SCM strategies followed by leading automotive companies, challenges in proving efficient service and how it can be improved to remain competitive in the market. Through this research one can understand the gaps and limitations existing in the Automobile service industry in India and the ways in which their service can be improved. The research will also provide some insight into the evolving practices and latest strategies in SCM by leading automobile firms and propose new paths for the four wheeler service centers to improve service quality and thereby increase customer satisfaction and their long term retention.

OBJECTIVES

1. To analyze the current Supply Chain Management techniques followed by the service centers of market leaders in the Indian automobiles sector.
2. To analyze the effectiveness of Supply Chain Management in the four wheeler automobile service centers in the city of Pune.
3. To study and investigate about the latest practices and possibilities in improving the Supply Chain Management in the passenger car segment of the Indian automobile industry.

LIMITATIONS

1. The research focuses only on the four wheeler passenger cars after sales services.
2. The scope of the research is limited to automobiles service centers in Pune.
3. The research mainly targets lower level of automobile industry and focuses on services and not on sales.

REVIEW OF LITERATURE

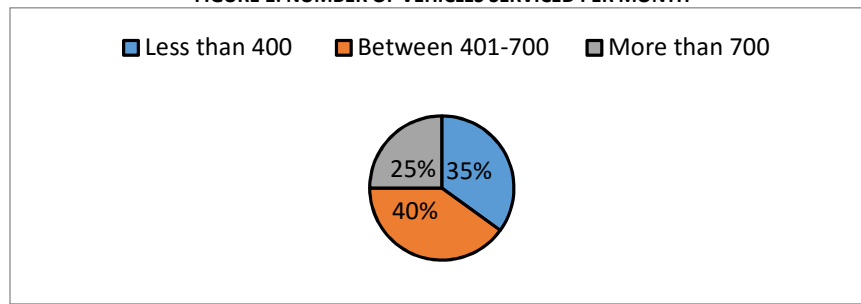
1. **Rathinaraj S Daniel & Dr. Magesh R. (2015)** in their research paper, "The Impact of Supply Chain Integration on Automobile Industry's Performance" studied the need of collaboration of automotive service sectors with world class players. They noted the efforts made by the Indian companies to improve co-ordination and integration with their suppliers both within and outside the national boundaries. They also pointed out the need to collaborate with suppliers with significant technical expertise and experience to improve quality and lead time.
2. **Bhattacharya Souresh, Dr. Mukhopadhyay D. et al (2014)** in their research paper titled "Supply Chain Management in Indian Automotive Industry: Complexities, Challenges and Way ahead" have studied supply chain practices in this sector in order to identify the key factors of differentiation which would ultimately provide competitive advantage. They noticed that Indian industry is yet to match SCM standards of developed countries and needs significant changes. Also, there is a need for external support from Govt. and OEMs in terms of policies and regulations. In order to improve the cost effectiveness, a lot of synergy between OEM and supplier, close collaborative association of all stake holders and innovative methods of supply network and transportation using information and communication technologies are required.
3. **MangalDharamvir & Gupta Tarun (2012)** in their paper titled, "Criticality of Supply Chain in Indian Auto-industry" have identified the major issue of hassle free and suave inventory management faced by Indian automobile industry. To reduce the impact of inventory uncertainties, they have suggested various tools and methods to overcome the problems of out-of-stock/over-stock/under-stock, lead-time, transportation, and forecast demand.
4. **Naidu C.V. et al (2010)** in their paper titled, "Success Factors in Automobile Service Sector: A Study on Four Wheeler Service Centers in India", through their survey carried out in the four wheeler automobile service centers across India revealed that modernization and continuous improvement should lead to growth of service sector and long-term relations with customers.

RESEARCH METHODOLOGY

The topic on 'The impact of supply chain management in Indian automobiles service center (4 wheelers)' was selected to study the best practices and analysis of current SCM practices in Indian automobile service centers and methods to improve it. The sample size selected for this study was 20 which comprises of managers and staff employed in spare parts management of four wheel automobile servicing centers. To test the feasibility of collecting data, a pilot study was conducted by telephonic interview with the manager of "Jawan Automobiles", an automobile service center with 600 plus vehicles serviced per month. Also discussion was conducted with Professor MK Gandhi of SIMS Pune regarding the possibilities and scope of the topic. The interviews will shed some light on managerial practices for the improvement and efficiency of the system and supply chain methods followed by the automobile service centers. A questionnaire was prepared for collecting relevant information. Secondary data collected are from the internet, magazines, newspaper, and journals. These were referred to build an essential base to our research paper. The data analysis was done utilizing MS Excel instruments. Representations like tables, diagrams and graphs were utilized to guarantee right and exact understanding of information.

RESULTS

FIGURE 1: NUMBER OF VEHICLES SERVICED PER MONTH



Discussion: From figure 1, it is revealed that 75 percent of servicing stations service up to maximum of 700 vehicles per month whereas 25 percent servicing centers service more than 700 vehicles per month. The 700 plus target was successfully completed by systematic planning and full utilization of available resources.

TABLE 1: CATEGORIZATION OF STOCK BASED ON CONSUMPTION AS FAST, MEDIUM AND SLOW MOVING

S. No.	Response	N=20	Percentage (100%)
1	Yes	20	100
2	No	Nil	Nil

Discussion: From table 1 it is observed that all servicing centers are carrying out categorization of stock based on its consumption pattern as Fast, Medium and Slow moving. Such practices were not so common a decade ago in the automobile industry which was at nascent stage during that time.

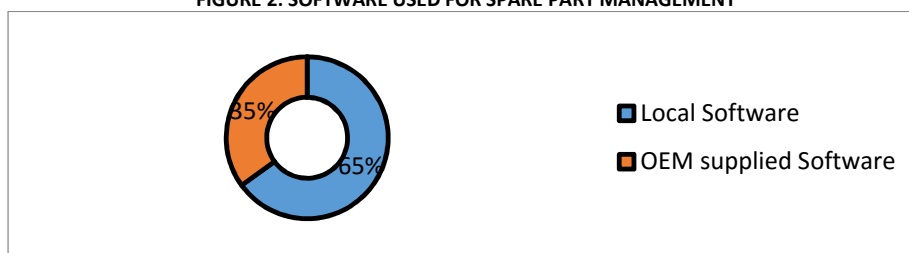
TABLE 2: DIGITIZATION OF INVENTORY MANAGEMENT SYSTEM

S. No.	Response	N=20	Percentage (100%)
1	Yes	20	100
2	No	Nil	Nil

Discussion: From table 2, it can be said that all service centers have inventory management system employed and the systems in place are digitized. This amplifies the usefulness of digitized inventory management system as a highly effective tool

The above results are in line with what **Naidu, C.V. et al (2010)** inferred in their paper titled, "Success Factors in Automobile Service Sector: A Study on Four Wheeler Service Centers in India", through their survey which was carried out in the four wheeler automobile service centers across India revealed that modernization and continuous improvement should lead to growth of service sector and long-term relations with customers.

FIGURE 2: SOFTWARE USED FOR SPARE PART MANAGEMENT



Discussion: From figure 2, it can be observed that all servicing centers are using software for spare parts management. However, the software packages used are based on the requirements of individual service centre and 65% of the servicing centers are using locally developed software and only 35 % of respondents are using OEM supplied software. There is no synergy of tools and techniques used for effective management of spare part management. There is a requirement of better tools and methods to improve the spare part management system. 65% of the service centers used local software and will not get the inventory availability in other related service centers. These service centers visibility and reach of spares is limited compared to OEM supplied software which gives information about inventory availability and thereby providing faster and effective service to customer.

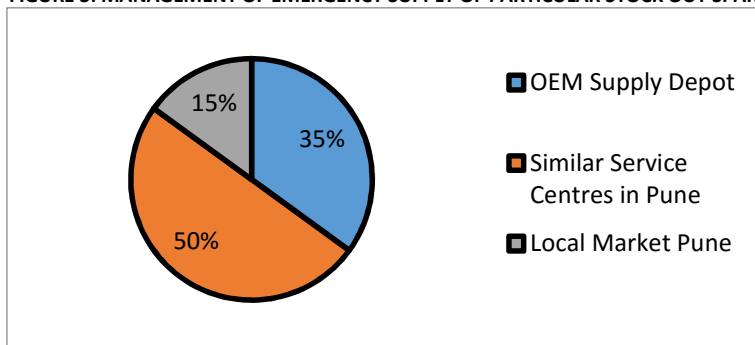
The above results are similar to the results of **Mangal Dharamvir & Gupta Tarun (2012)** in their paper titled, "Criticality of Supply Chain in Indian Auto-industry" wherein they have identified the major issue of hassle free and suave inventory management and have suggested various tools and methods to overcome the problems of out-of-stock/over-stock/under-stock, lead-time, and forecast demand.

TABLE 3: DEAD STOCK BEING A PROBLEM

S.No.	Response	N=20	Percentage (100%)
1	Yes	20	100
	(i) Due to accident repair stock	06	30
	(ii) Due to peculiar snags	14	70
2	No	Nil	Nil

Discussion: From the table 3, it can be said that the respondents unanimously agreed that dead stock is a serious problem in vehicle servicing industry. 70% of the dead stock is created due to peculiar snag rectifications carried out previously and 30% of dead stock is due to accidental vehicle repairs. While considering the fact that accident vehicles will consume spares which are not usually consumed, it creates differences in forecasting and estimate preparation by software which led to over procuring and resulting in dead stock.

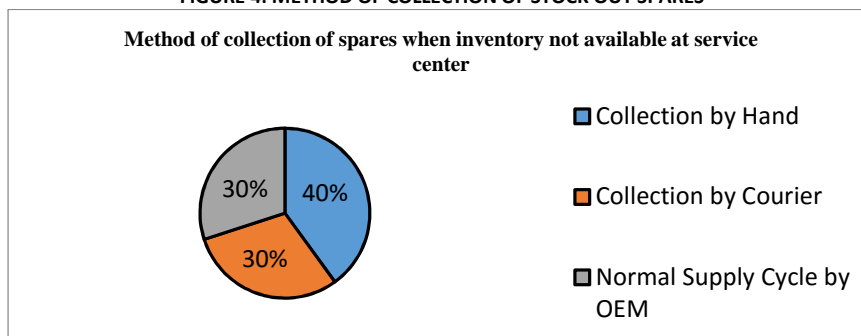
FIGURE 3: MANAGEMENT OF EMERGENCY SUPPLY OF PARTICULAR STOCK OUT SPARE



Discussion: Figure 3 clearly indicates that 50% of the spare parts in emergency are sourced from similar service centers. Only 35% spares are sourced from OEM supply depots. 15% spares are also found to source from local market. This fractured verdict clearly indicates the lack of synergy between the service centers and the spare parts management system of OEM. By creating such a synergy will lead to easier, low cost procurement of spare parts. An integrated ERP system will also help to create synergy.

The above results are in agreement with the findings of **Bhattacharya Souresh, Dr. Mukhopadhyay D et al (2014)** in their research paper on "Supply Chain Management in Indian Automotive Industry" wherein they have studied supply chain practices in this sector in order to identify key factors of differentiation which would ultimately provide competitive advantage. They noticed that Indian industry is yet to match SCM standards of developed countries and needs significant changes. Also, there is a need for external support from Govt. and OEMs in terms of policies and regulations. In order to improve cost effectiveness, a lot of synergy between OEM and supplier, close association (collaborative) of all stake holders and innovative methods of supply network and transportation using information and communication technologies are required.

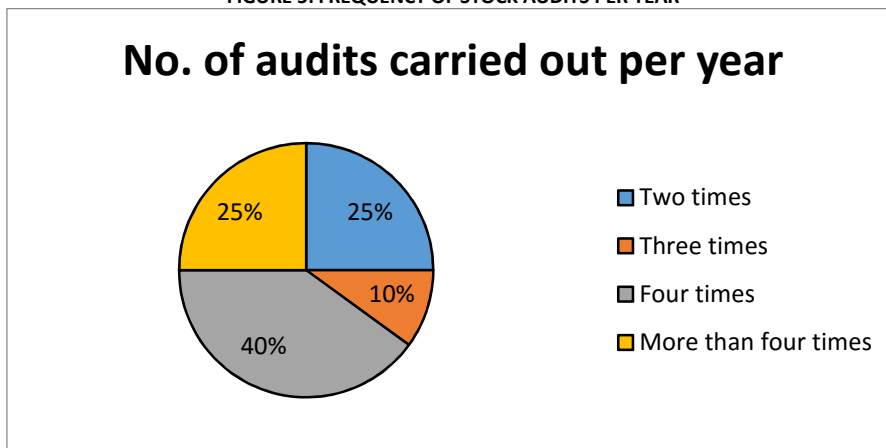
FIGURE 4: METHOD OF COLLECTION OF STOCK OUT SPARES



Discussion: Figure 4 indicates that the collection of stock out spares does not follow a fixed pattern. 40 % collections are done by hand where as 30% collections are either got through courier or through the normal supply channel of OEM. The higher percentage of spare collection by hand suggests the urgency of repair, as forced upon by the customers. With internet of things and better ERP, service centers can help each other supplying stock when it is not available with one service center which improves service time of vehicles.

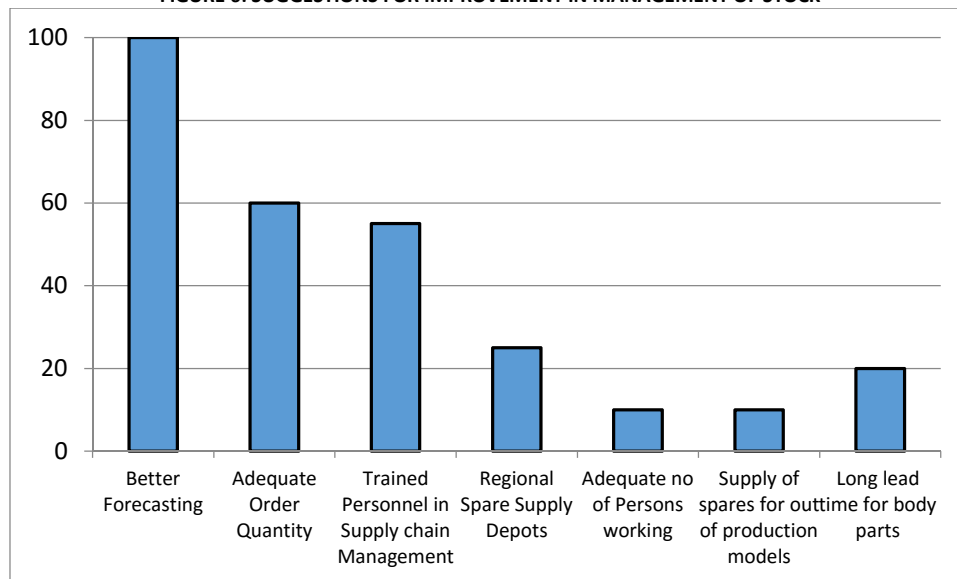
Similar view was also expressed by **Bhattacharya Souresh, Dr. Mukhopadhyay D et al (2014)** in their research paper on "Supply Chain Management in Indian Automotive Industry: Complexities, Challenges and Way ahead" in which they commented that ' In order to improve cost effectiveness, a lot of synergy between OEM and Supplier, close association (collaborative) of all stake holders and innovative methods of supply network and transportation using information and communication technologies are required'.

FIGURE 5: FREQUENCY OF STOCK AUDITS PER YEAR



Discussion: From figure 5, it may be observed that 40% of the servicing centers are having stock audits every quarter. Only 25% servicing centers are having more than 04 stock audits and similar percentage having only half yearly Stock Audit

FIGURE 6: SUGGESTIONS FOR IMPROVEMENT IN MANAGEMENT OF STOCK



Discussion: From figure 6, it is observed that improvements are needed in order to manage spare part stock in better way. To improve the existing system there is a need to collaborate with suppliers with technical expertise in better forecast so that overall quality and lead time improves. Lot of coordination and integration among all stake holders is required. The three major factors for effective and improved management of stock was found out to be better forecasting techniques, adequate order quantity and availability of trained personal at inventory management. Forecasting can be improved and problem of dead stock can be reduced by creating a new category of regular spare parts consumed during accidents. Adequate order quantity can be achieved by using forecasting done by ERP and monitoring the purchase order by experienced personal and making necessary corrections. Experienced personal is necessary so as to monitor the purchase order and faster delivery of spare parts to workers.

Similar views were echoed by **Rathinaraj S. Daniel & Dr. Magesh R. (2015)** in their research paper, “The Impact of Supply Chain Integration on Automobile Industry’s Performance”. They noted the efforts made by the Indian companies to improve co-ordination and integration with their suppliers both within and outside the national boundaries. They also point out the need to collaborate with suppliers with significant technical expertise and experience to improve quality and lead time.

CONCLUSION

The first objective of study was the analysis of the current Supply Chain Management techniques followed by the service centers of market leaders in the Indian automobiles sector. The practices which were not so common 10-20 years which is followed by almost every automobile service centers were found to be implementation of ERP software (100%), stock categorization (100%), barcode system (25%) and estimation based on sales forecast which is done by ERP software’s and thereby effectively delivering the vehicles on time. It was found that issues with dead stock can be reduced by creating a separate category for spare parts consumed for accident vehicles. The method of collection of stock during urgency should be more from similar service centers nearby their by saving time and cost of procurement which can be facilitated by a common ERP software which connects these similar service centers. Most of the automobile service centers presently use their own inventory management software which should be changed to a common platform so that the entire procurement process will be possible in least amount of time and cost. The major automobile car manufactures in India use Dealer Management System (DMS) an ERP system which connects service centers on national level thereby keeping track of consumption of spare parts and their availability. In general, it was observed that the three major factors for effective and improved management of stock was found out to be better forecasting techniques, adequate order quantity and availability of trained personal at inventory management.

The second objective was “To study and investigate about the latest practices and possibilities in improving the Supply Chain Management in the passenger car segment of Indian automobile industry”; it was found that the sales forecasting by ERP software, centralized DMS software and connecting similar service centers were the certain trends observed in the industry while creating a common platform of ERP for similar service centers, online status check of the vehicle at service center regarding completion of work, automated intimation of final bill and major work done, automatic indication of next service once the deadline is reached, employee performance monitoring were found out to be feasible possibilities.

RECOMMENDATION

Better forecasting/ special category for accident spare parts: Based on the research, problem of dead stock arises mainly due to categorizing accident spare parts along with running repair and service stocks. It can be rectified by categorizing accident spare parts as a separate entity so that forecasting of such parts can be made more carefully. The company's reorder level should be set depending on the frequency of consumption of stocks rather than setting a general point.

Training of employees according to requirements: According to the findings, inventory store gets busy in the morning window. Addition of one trained employee during the peak hours in delivery of stock is advisable. Trained manpower in spare part store would reduce rush and chances of wrong entry. Training can also be imparted to other employees so that it will be helpful at the times when any person in inventory section takes leave or resigns the job.

Adequate order quantity: The quantity ordered should be calculated by economic order quantity and correct safety stocks so that non availability of spare parts situation can be avoided. For that company should have trained /experienced personal for the inventory management.

Common ERP software connecting similar service centers: Most of the automobile service centers presently use their own inventory management software which should be changed to a common platform so that the entire procurement process will be possible in least amount of time and cost

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