

Network Optimization for Distribution of South Based OEM's Passenger Vehicles to other Zones of India with Reduced Lead-Time

R. Srinivasan, S. Poongavanam, R. Vettriselvan, J. Rengamani, Fabian Andrew James

Abstract: A survey conducted among top auto makers in India highlighted the fact that technology is widely sent to be a supply chain enable, reducing inventory levels and stocking, shortening lead times and fostering as sprit of collaboration with suppliers and dealers. IT Managers indicate lack of alignment between business goals and it implementation plans in majority of the companies. Although it found that there is a high awareness among Indian Tier-1 companies regarding lead time. The usage of productive enhancing tools such as data analytics, ERP, rivet care still at low levels specially among Tier-2 suppliers due to challenges such as cultural, financial, organizational and technological barriers to be overcome majority of the maimed at improving service levels. E-payment and clearance facilities and enhancing visibility leading to be after coordination and reducing on core activities, vendor base rationalization at all echelons of the supply chain.

Index Terms: Lead time, Network Optimization, OEM, Passenger, Vehicle

I. INTRODUCTION

The Automobile industry is depending up on the demand in the market, and the demand will come when the customers are satisfied with the output. The automobiles are growing day by day through the customer requirement and adaptability (1,3). It will come when the customers get the product at right place at the right time in favorable cost. The OEM and dealers should supply the goods with faster time to the customers so that the distribution will be maintained successfully (2,5). The distribution pattern will help the OEMs and dealers and also the customers to achieve their needs (4). The study will be useful to distribute the finished goods to the customers in reduced lead-time.

II. SCOPE OF STUDY

The study aims to analyses a better way to distribute South based OEMs passenger vehicles to other zones of India by an

optimized network in reduced lead time under the supervision of Wallenius Wilhelmsen Logistics India Pvt.ltd(5,7). This study may be useful for the company to make a good optimized network for distribution of other goods with in India by reduced lead time(8). Hence the present study on the network optimization under Wallenius Wilhelmsen Logistics India Pvt.ltd. Has provide scope for analyse the situation. It paves way to suggest the improvement in the distribution pattern by the company to further improve the effectiveness and efficiency in distribution.

III. OBJECTIVES

- ❖ To study on network optimization for distribution of south based OEMs passenger vehicles to other zones of India with reduced lead time.
- ❖ To study the distribution pattern used in the market for distribution of finished goods.
- ❖ To analyse the market movement for efficient movement of automobile finished goods.
- ❖ To study the time taken for distribution of fished goods.

IV. RESEARCH METHODOLOGY

Research design used in this study is descriptive research design. Descriptive research studies are those which are concerned with describing the characteristics of a particular individual or group of individuals. Primary and Secondary data were collected for the study. Primary data are collected through the questionnaire and personal interview. The data are collected from the trailer agencies and transporting companies. Secondary data are collected from the government authority's public companies and also from articles from internet and magazines. The total population used for the study is 30. The population used in the study is depend upon the market situation and specification required. The collected data were analysed and tabulated for further interpretation percentage analysis and Chi-square test were done for data analysis.

V. LIMITATION OF THE STUDY

- The few respondents were not willing to share the information's in the questionnaire.
- Lack in updated information's from the government s ide take time to make a solution in research.
- the new GST policies makes lot of changes in the researches and the study.

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- Since the period of the study was only three months, the scope of the study restricted to few areas.

VI. ANALYSIS AND INTERPRETATION

TABLE-1 Table showing the years of experience of the company

YEAR	FREQUENCY	PERCENTAGE
1-3years	0	0
3-5years	6	20
5-10years	10	33.33
Morethan10years	14	46.66
TOTAL	30	100

From the above table 46.66% of the responding companies are more than 10 years experienced, 33.33% of companies 5-10 years experienced and remaining 20% companies are under 3-5 years experienced. Majority of the companies are experience more than 10 years in inland distribution.

TABLE-2 : Table showing the number of trailers under the control of the company

Number of Trailers	Frequency	Percentage
5-10	11	36.33
10-15	16	53.33
More than 15	3	10
TOTAL	30	100

From the above table 53.33% of the respondents belongs to 10-15 trailers, 36.33% of the respondents are belongs to the 5-10 trailers, and remaining 10% of the respondents have more than 15 trailers. Majority of the respondents manages to take 10-15 trailers.

TABLE-3: Table showing the different types of trailers used for carrying goods.

Trailers	Frequency	Percentage
Automobile carrier	5	4
Container carrier	12	71
Low bed carrier	13	25
Total	30	100

From the above table showing that 4% respondents are belongs to automobile carrier, 71% of the respondents are preferred to container carrier and 25% of the respondents are preferred to low bed carrier. Majority of trailers are used by container carrier (71%).

TABLE-4 : Table showing the types of automobile carrier trailers owned by the company.

Types of automobile carrier	Frequency	Percent age
Truck	3	10
Low-bed trailers	9	30
Tractor-trailer	18	60
Total	30	100

From the above table 10% respondents are belongs to truck trailer carrier, 30% of the respondents are preferred to low bed trailers and remaining 60% of the respondents are preferred to tractor trailer. Majority of the respondents are used by the Tractor trailers.

TABLE-5 : Table showing the companies following the Central Motor Vehicle Rules 1989

Company follows Central Motor Vehicle Rules\ CMVR	Frequency	Percentage
Yes	25	83.33
No	5	16.66
Total	30	100

From the above table 83.33% respondents are following the Central Motor Vehicle Rules 1989, 16.66% of the respondents are not following Central Motor Rules 1989. Majority of the companies are following the Central Motor Vehicle Rules 1989

TABLE-6 : Table showing the maximum distance travelled by a trailer per day.

Distance	Frequency	Percentage
200kms	0	0
250kms	4	13.33
300kms	16	53.33
Morethan300	10	33.33
Total	30	100

From the above table there is no respondents in the minimum distance of 200. 13.33% of the respondents are preferred to 250 kms and 53.33 % of the respondents are preferred to 300 kms, remaining 33.33% are more than 300 kms. Majority of the respondents are travels 300 kms (53.33%)

TABLE-7 : Table showing the whether there is a timing for the transportation

Timing	Frequency	Percentage
Yes	20	66.66
No	10	33.33
Total	30	100

From the above table 66.66% respondents are following timing for the transportation remaining 33.33% of the respondents are not following timing for the transportation. Majority of the companies are maintaining timing for the movement of the goods.

TABLE-8 : Table showing whether the trailers have any speed restrictions

Speed restriction	Frequency	Percentage
Yes	19	63.33
No	11	36.66
Total	30	100

From the above table 63.33% respondents have speed restrictions on the transportation, remaining 36.66% of the respondents does not have speed restrictions. Majority of the trailer companies are following seed restrictions.

TABLE-9 : Tables showing how many drivers are allotted for a trailer

Drivers	Frequency	Percentage
Single driver	15	50
Double driver	15	50
Total	30	100

From the above table the 50% of the trailer agencies are used by the single driver and remaining 50% of the companies are using double driver. The companies are equally using double driver and single driver system.

TABLE-10 : Table showing the kilometre covers when it is single driver

Distance	Frequency	Percentage
200 kms	0	0
250 kms	3	10
300 kms	12	40
More than 300 kms	15	50
Total	30	100

From the above table 10% of the respondents are covers 250 kms with single driver, 40% of the respondents covers 300 kms with single driver and remaining 50% of them covers more than 300 kms. Majority of the respondents covers more than 300 kms with single driver.

TABLE-11: Table showing the kilometer covers when it is double driver

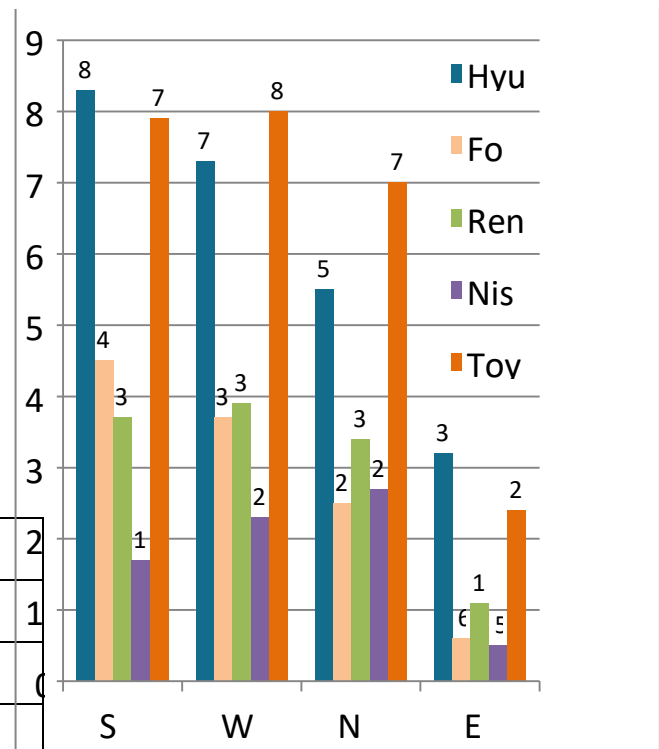
Distance	Frequency	Percentage
250	0	0
300	4	13.33
350	5	16.66
Morethan350	21	70
Total	30	100

From the above table 13.33% of the respondents covers 300 kms with double driver, 16.66% of the respondents cover 350 kms with double driver and remaining 70% of them covers more than 350 kms. Majority of the companies uses double driver system and covers more than 350.

Driver Description in India

A single driver can only drive around 290 kms, but if it is double driver they can drive around 500 kms. The HMV driver must get the training program for an efficient safe and

secure transportation. The drivers must get promotional activities like awards and starting for the best performer. The driver must conduct safety classes (2 day) from IDTR (before the journey). Volume of dealers for OEM in south



S-South, W-West, N-North, E-East

VII. RESULTS AND DISCUSSION

- The Nissan Renault & Ford are showing less volume of dealers in each region.
- Hyundai and Toyota shows a higher number of dealers in four regions and choose the favourable one.
- The dealers of the OEM helps the customers to see the product and choose the favourable one.
- North based customers have to wait 15-20 days to get the cars from companies like Ford, Nissan. This will make the customers to switch on to different company products.

VIII. FINDINGS

- ✓ Companies are experienced more than 10years in Inland distribution.
- ✓ Majority of the respondents manages to take 10-15 trailers.
- ✓ Majority of trailers are used by container carrier (71%).
- ✓ Most of the companies are used by the Tractor-trailers.
- ✓ Most of the companies are following the Central Motor Vehicle Rules 1989.
- ✓ Mostly the trailers are surviving 300 kms per day (53.33).
- ✓ The trailer companies are maintaining timing for the movement of the goods.

- ✓ The companies have speed restrictions on movement of finished goods within India.
- ✓ The companies are equally using double driver and single driver system.
- ✓ The single driver trailers are covers more than 300 kilometres.
- ✓ Most of the companies used double driver and travels more than 350 kilometres.
- ✓ The drivers should attend IDTR classes for the better output.
- ✓ Some companies do not have sufficient dealers in each region, it will result in less sales and less customer interaction.

IX. SUGGESTION

- ❖ Implementation of depot's will help the 3PL to supply goods with reduced lead-time.
- ❖ Combinational load will be useful for handling different company products to two or more dealers a single transit.
- ❖ The depot will improvise the distribution of cars from the plant to other regions of the country.

X. CONCLUSION

The study on network optimization for distribution of south based OEM's passenger vehicles to other zones of India with reduced lead-time helps to conclude that the study has made a result to make a multi-user depot within India under the control of 3rd Party Logistics (3PL). It will helps to reduce the lead-time from 15 days to 3-4 days. Frequent flow of passenger vehicles from Manufacturers to the depot will helps to make customers satisfied a convenient to their product. It helps 3PL to provide support as a strategic supply chain partner with focus on quality, cost, lead-time and capacity requirements and also helps the Original Equipment Manufacturers (OEM's) to supply their product in a short period. The retention of existing customers and gaining new customers achieved by satisfying the customer needs through standardized distribution via depot.

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Dr. R.Srinivasan working as a Associate Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He done his Doctorate of Philosophy in Management, awarded by AMET University, Chennai. Pragmatic in approach, optimistic in attitude and dynamic in action are the keys for a successful 24 years of teaching experience out of which 3 years served as a Head of department and 4 years of Industrial Experience. Guiding the research work in Ph.D., M.Phil., and M.B.A., Projects. He is the Coordinator of AMET Staff Welfare Committee, Asst Controller of Examinations, and Asst Director of HRD in AMET University. He is a professional member of AIMA and United Writers Association. He has authored 4 books in the area of management. He has taken active part in National as well as International level seminars, published research articles in SCOPUS indexed journals and other reputed international journals. He has specialized in the areas of Finance, Marketing and Strategic Management.



Dr.S.Poongavanam working as a Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He done his Doctorate degree in Bharathidasan University. So far he has published nearly 127 articles in Scopus indexed/UGC approved journals and other indexed journals. He participated and presented 25 papers in international conference/seminar. He got five awards from reputed institutions. He is member of editorial board in seven international journals.



Dr.R.Vetrivelvan, working as a Assistant Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. Formerly he acted as a Head of the Department, School of Commerce and Management Studies, DMI-St. Eugene University, Zambia. He published more than 35 research articles in SCOPUS/UGC/Referred international/ national journals and Conference volumes. He received travel grant award to USA from Population Association of America, Doctoral Fellowship from ICSSR, New Delhi. He got received best paper, best paper presenter, Best Young Faculty 2018, Bright Educator 2018 and Best Academician of the year (Male) 2018. He presented more than 50 research article in the National and International Conferences conducted in India, Zambia and USA.



Prof.Dr.J.Rengamani working as a Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He has got more than 24 years of teaching and research experience in the field of management studies. The applicant has published more than 75 research articles in scopus indexed journals, UGC approved journals and other high impact factor journals. He has authored 5 books and guiding 7 Ph.D scholars. He has presented articles in many conferences and seminars. He has received 4 awards. He was nominated as the member of Board of Management of AMET University. Presently, he is working as the Professor and Director of AMET Business School.



Dr. Fabian Andrew James has completed his PhD in the field of Management specializing in the area of HR and published more than 25 articles in renowned journals including scopus indexed journals. He has completed his post graduation in the field of Human Resource Management in Madras Christian College and undergraduate degree in Loyola College, Chennai. He has acquired a graduate certificate in Human Resource Management from Swinburne University, Melbourne, Australia in 2007. He has more than 9 years of corporate experience in the area of shipping and logistics as well as Human Resource Management.

