Journal of Rural and Industrial Development
12 (1) 2024, 34-39
http://publishingindia.com/jrid/

Upholding and Prop Up of Rural and Industrial Development via Effective Transportation Management System

Vipul Chalotra*

Abstract

Effective transportation management system (TMS) is of surmount importance as it facilitates the products to the entire world that too promptly and assures wider market coverage. This modern market is hovering for newer and wider products acceptance and thereby the product placement is highly needed. This products acceptance and availability is supported and fostered by effective TMS. The present research exhibits some of the central functions performed by TMS. The research is conducted on 44 small scale firms operating in District Udhampur of J&K UT. The primary data is gathered from small scale firms' managers. The variables chosen for the research purpose are: "Transportation service availability and quality", "Road safety mapping", "Carrier schedule and management" and "Transportation organisation support". The results of the ranking table explicated that the variable "Road safety mapping" ranked first, "Transportation service availability and quality" scored rank second. Third rank is attained by the variable "Carrier schedule and management" and "Transportation organisation support" gained fourth rank. Further, the results of the linear hierarchal regression revealed that transportation organisation support ensures effective TMS which facilitates rural and industrial development.

Keywords: Transportation, Small Scale Units, Functions, Management, Rural

Introduction and Literature Review

An effective Transportation Management System (TMS) focuses on imparting and providing logistics that helps in supplying the supplies with less costs and time. It associates Order Management System and Warehouse/Distribution Center of the businesses. The prominent task i.e. procurement and shipping or transportation to the desired location is done by the TMS today. The procurement is known as inbound and transportation/shipping is known as outbound logistics helps in the selection of the low cost provider with the best low cost means of transportation. All the tracking, routing is done through electronic load tendering. However, TMS today executes major functions such as Tracking, vehicle repairs and maintenance, low fuel costing, effective and bar coded warehousing, EDI felicitation, vehicle load specifications, accounting, traveler and cargo handling, sound inbound and outbound transportation mode, effective yard management, shipment batching of orders, scheme address and simulation, cost controls, optimising terrestrial needed transport rounds, advanced shipping freight audit and payment, order visibility, carrier specifications and management and many others. The present research focuses on only four functions performed by TMS namely road safety mapping, Transportation service availability and quality, carrier schedule and management and transportation organisation support because the firms is small units and they could not avail the contemporary functions of TMS. The managers of these small scale firms takes into consideration multiple attributes while making decision regarding transportation system to be adopted. They mainly put attention on cost and transit time as the primary factor for making decision. Selecting the transport mode choice, carrier choice, negotiating rates, service levels, evaluating carrier performance, etc. are the basic relevant transportation performance variables that are given due consideration for selecting effective TMS (Monczka et al., 2005). Earlier researches connotes that transportation costs counts between 20% and 35% of total production

* Assistant Professor, Department of Commerce, Govt. SPMR College of Commerce, Jammu, J&K, India.
Email: vipulchalotra@gmail.com

and logistics costs of a product (Russell & Taylor, 2003; Pedersen & Gray, 1998). However, reducing the cost of transportation could make business competitive and efficient (Reimann, 1989).

Transportation had upgraded the trade and connected the world. The trade uphold and prop up is being noticed from the local boundaries to the National and from National to International boundaries (Tolley & Turton, 1995). The transport modes now-a-days caters to the urgent need of the product availability with exact originality that too at lower costs, logistics insurance, minimisation of the life-cycle-cost and in maintaining reliability, consistency and availability of products. Further, an effective transportation management module assists in reducing costs through better route planning, applying RFID, GPS-enabled technology, load optimisation, carrier, more flexibility to make changes in delivery plans and timely completion of supply chain (Black, 2001). Transport system affects the production, production costs, logistics activities, sales, delivery schedule and assists in promoting market share. The present study explicates some of the functions performed by TMS influencing the transportation choice and selection in small scale units operating in District Udhampur of J&K State that in lieu fosters rural and industrial development.

Hypothesis Formulation

The following is the main hypothesis of the study:

Hyp1: *Transportation Organisation support from NITCO and other agencies ensures effective transportation management system leading to Industrial development.*

Obj1: The objective is to analyse whether support from transportation agencies ensures effective transportation management system that ultimately leads to small scale Industrial development and further rural development.

The Research Framework

The research framework is as follows:

Sampling

The present research was conducted in District Udhampur of Jammu & Kashmir state. In District Udhampur there are 49 registered firms among which 44 were functional and were operating under DIC (District Industries Centre). DIC is newly constructed centre in District Udhampur having dearth of research but connotes Industrial and rural development. All the 44 small scale units were categorised into ten lines of operations which were similar in their nature of production and products like cement (8), pesticide (3), steel (3), battery/lead/alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). The miscellaneous comprised of 11 small scale units namely M/s Supertech Industry**,** M/s Luxmi Electronics Works**,** Shaj Nath Vanaspati Ltd.**,** M/s Aditiya Cables, Poles and Transformers**,** Shankar Lime Industry**,** M/s Unique Carbon Industries**,** M/s B.S Traders**,** M/s Vijay Candles**,** Everest Health Care Products**,** M/s J.K Petro Chemicals**,** M/s Ajay Ice Factory**.**

Research Instrument

The research instrument for the present research was self-developed questionnaire which was prepared after consulting meticulous academicians, scholars, related review and the same was discussed with academicians and research scholars for ensuring the content validity of the construct. The questionnaire comprised of general questions pertaining to profile of respondents profile and other questions pertaining to TMS. The questions in the questionnaire were in ranking form, dichotomous form and five-point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree. In order to make the study comprehensive and elaborative ranking tables and linear regression were used in the study.

Data Collection

The first hand data were collected from the managers of all the 44 small scale firms operating under DIC via questionnaire. The respondents were duly approached to gather intensive response. Vivid ethical contemplations were kept in mind while collecting response. The secondary data (backbone of research) were collected from different sources viz-a-viz internet, books and empirical papers from referred journals. In the present study only Ranking tables and regression analysis were used for eliciting inferences.

Data Analysis and Results

The primary data for the study were collected from all the 44 small scale firms' managers via questionnaire and were tabulated for making it more consequential and comprehensible. Table 1 outlines the mean ranking of the various functions performed by TMS in the small scale firms operating in District Udhampur of J&K State. The 44 small scale firms were classified into 10 lines of operations categorised into headings namely cement (8), pesticide (3), steel (3), battery/lead/alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). The main factors divulging effective TMS that assists in small scale industrial and rural development that are: "Transportation service availability and quality", "Road safety mapping", "Carrier schedule and management" and "Transportation organisation support". Overall, the variable "Road safety mapping" secured first rank as the managers perceived road safety mapping assists in the growth of small scale rural industries. "Transportation service availability and quality" obtained second rank. Third rank is attained by the factor "Carrier schedule and management" and rank fourth was gathered by "Transportation organisation support". Overall mean response to the various performed by TMS in descending order are 1.7 (Road safety mapping), 2.3 (Transportation service availability and quality), 2.6 (Carrier schedule and management) and 3.2 (Transportation organisation support), respectively. The variables/factors so ranked by the small scale firm's managers divulged that small scale firms' managers are taking into consideration the TMS that is prerequisite for the industrial and rural development that imparts benefits to the firms.

Table 1: Functions Performed by Transportation Management System in Small Scale Industries for Industrial and Rural Development

Units/Factors	*Transportation Service Availability and Quality*	*Road Safety Mapping*	*Carrier Schedule and Management*	*Transportation Organisation Support*
Cement	2 (I)	1 (II)	3 (III)	4 (IV)
Battery/Lead/Alloy	2.6 (II)	3 (IV)	1.8 (I)	2.7 (III)
Pesticides/Insecticides	2 (I)	1 (II)	3 (IV)	4 (III)
Conduit pipes	2 (II)	1 (I)	3 (III)	4 (IV)
Menthol	3 (III)	4 (IV)	2 (II)	1 (I)
Guns	2.6 (III)	2.4 (II)	3 (IV)	2 (I)
Steel	2.6 (II)	1.4 (I)	2 (III)	4 (IV)
Gates/Grills/Varnish/Paint	2 (III)	1 (I)	3 (II)	4 (IV)
Atta/Maize/Dal mills	2 (II)	1 (I)	3.3 (III)	3.6 (IV)
Others (Miscellaneous)	2.3 (III)	1.7 (I)	2.8 (II)	3.2 (IV)
Mean & Rank	2.3 (II)	1.7 (I)	2.6 (III)	3.2 (IV)

Note: Where 1 denotes "highest rank" and 4 denotes "lowest rank"

The mean ranking of the various transportation functions performed by TMS that promotes industrial and rural development are as follows:

- *Cements*

Eight small scale units operating under this category were M/s Associated Cements, Zenith Cement Industry, Shivalik Cements, M/s Continental Cement Industry, Wullar Cements, M/s Shri Nath Industry and Uma Cement Industry being found enrolled as small scale firms. The mean ranking associated with the TMS of these small scale units assigned rank one to the factor/function "Transportation service availability and quality" as it is prominent need of effective TMS. "Road safety mapping" was accorded rank two by mangers of small scale units. "Carrier schedule and management" was third positioned and "Transportation organisation support" was positioned fourth. This implies that effective TMS mainly results in providing qualitative transport services at reasonable cost.

- *Battery/Lead/Alloy*

Five small scale firms related to battery/lead/alloy were Radha Industries, Pilot Batteries, Suraksha Batteries, Durga Batteries and Avtar Batteries. The mean ranking quoted by this small scale firms group were: "Carrier schedule and management" which was accorded first rank one as its the basic TMS function performed by the small scale Industrial firms. "Transportation service availability and quality" attained rank two. "Transportation organisation support" ranked third. Accordingly, "Road safety mapping" ranked four as represented in the Table 1.

- *Pesticides/Insecticides*

Pesticides/Insecticides category included units namely M/s Dhanuva Agritech Ltd., Safex Chemicals Ltd. and M/s Modern Insecticides. The mean ranking under this category is: "Transportation service availability and quality" ranked one,

"Road safety mapping" ranked two,

"Transportation organisation support" ranked three, and

"Carrier schedule and management" ranked four, respectively.

- *Conduit Pipes*

M/s Pee Kay Products and Rukhmani plastics were the two units operating under this sphere. As far as mean ranking pertaining to various functions performed by effective TMS in these small scale firms in concerned: "Road safety mapping" function attained first number. "Transportation service availability and quality" attained rank two. "Carrier schedule and management" attained rank three. "Transportation organisation support" attained rank four.

- *Menthol*

M/s Harikripa Perfumes Pvt. Ltd. and M/s Mahadurga were two small scale units. The mean ranking quoted by the managers of these small scale firms was that first rank was assigned to "Transportation organisation support". Rank two was assigned to "Carrier schedule and management" as it presumed to be important function of TMS. Rank three was assigned to "Transportation service availability and quality". The fourth rank was assigned to "Road safety mapping".

- *Guns*

Under this category, M/s Gulab Gun Factory and M/s Hunter Gun factory were the two competitors. Both the units ranked one to "Transportation organisation support" subsequently followed by "Road safety mapping" with rank two. "Transportation service availability and quality" was accorded rank three and "Carrier schedule and management" was assigned rank four. The ranking is portrayed in Table 1.

- *Steel*

Three units operating under this category were M/s Maha Luxmi Steel Fabricators, M/s Faqir Chand Sanak Raj and M/s Gupta Furniture. As far as mean ranking of the various functions performed by TMS is concerned: the variable "Road safety mapping" attained rank one as it seems to be the main benefit of effective TMS. "Transportation service availability and quality" was ranked two, "Carrier schedule and management" was ranked three and "Transportation organisation support" ranked four, respectively.

- *Gates/Grills/Varnish/Paint*

Rank one under this category of firms comprising of M/s Balaji Industries, M/s Wazir Engineering Works, ISRO Products, Shakti Engineering Works and M/s Everest Paints was gained by "Road safety mapping". "Carrier schedule and management" acquired rank two, "Transportation service availability and quality" attained rank three, and "Transportation organisation support" acquired rank four, respectively (Table 1).

- *Atta/Maize/Dal Mills*

Three main small scale units facilitating rural and industrial development operating were Shalimar Floor Mills, M/s Udhampur Dal Mills and M/s Sharda Enterprises. The mean ranking pertaining to TMS of these units ranked "Road safety mapping" ranked one. "Transportation service availability and quality" was assigned rank two. "Carrier schedule and management" ranked three. "Transportation organisation support" ranked four. It implies that road safety mapping appeared to be basic and prominent function to foster effective TMS.

- *Others (Miscellaneous)*

This category comprised of eleven small scale different units namely M/s Supertech Industry, M/s Luxmi

Electronics Works, Shaj Nath Vanaspati Ltd., M/s Aditiya Cables, M/s Unique Carbon Industries, M/s B.S Traders, Poles and Transformers, M/s Vijay Candles, Everest Health Care Products, Shankar Lime Industry, M/s J.K Petro Chemicals and M/s Ajay Ice Factory. The mean ranking of different functions performed by TMS was that "Road safety mapping" ranked one, "Carrier schedule and management" ranked two, "Transportation service availability and quality" ranked three and "Transportation organisation support" ranked four which facilitates rural and industrial development.

Overall, the small scale units ranked road safety mapping as the main function performed by these small scale firms which was followed by transportation service availability and quality, further followed by carrier schedule and management and subsequently transportation organisation support (Table 1).

Regression Analysis

Hierarchical regression analysis was used to test the research hypothesis (Table 2). The linear regression model with value R .701 discloses 70% relationship between the two variables i.e. dependent variable (Transportation Organisation Support) and the independent variable (TMS). The R^2 value .639 states 63% of variation in Transportation Organisation can be explained from TMS. Adjusted R^2 value .540 indicates that if any more independent variable is added the value of R^2 will increase. Further beta value reveals significant relationship of independent variable with dependent variable via its value. F-value is significant at 5% confidence level. Thus the hypothesis *"Transportation Organisation support from NITCO and other agencies ensures effective transportation management system leading to Industrial development"* is accepted as represented by its significance level $p < .05$.

Table 2: Regression Model Summary

Model	*R*	*R^2*	*Adjusted R^2*	*Std. Error of Estimate*	*F Value ANOVA*	*Sig. Level*	*β*	*t*	*Sig. Level*
1.	.701	.639	.540	.1961	32.521	.000	.618	7.124	.017

a. Predictors: (Constant), Transportation Organisation Support

b. Dependent Variable: Transportation Management System

Conclusion

Transportation had connected the world and had made it a small village. Effective transportation raises the level and standard of the country and promotes the country from low to higher levels. The present research puts fresh insights and divulges the mean ranking of the functions performed by TMS in the small scale firms operating in District Udhampur of J&K State. Though transportation executes numerous functions but this study considers four important transportation functions. The main functions that are performed by the small scale firms are: "Transportation service availability and quality", "Road safety mapping", "Carrier schedule and management" and "Transportation organisation support". Overall, the variable "Road safety mapping" scored rank first as the managers were of notion that TMS will definitely assist in imparting Road safety mapping at low possible cost. "Transportation service availability and quality" ranked second. Third rank is attained by "Carrier schedule and management" and rank fourth is gained by "Transportation organisation support" variable. Overall mean response to the various performed by TMS in descending order are 1.7 (Road safety mapping), 2.3 (Transportation service availability and quality), 2.6 (Carrier schedule and management) and 3.2 (Transportation organisation support), respectively. Further linear regression model summary results explicated that TMS ensures transport organisation support for facilitating rural and industrial development via development of small scale firms as portrayed by the respective significant values.

Limitations of the Study

The study is area specific, so the results of this study cannot have universal application as there could be environmental differences in different areas.

The results depend upon the response of the respective respondents. Anyhow all the efforts were applied to make the study free from any sort of biasness but the rule of subjectivity cannot be ruled out.

Future Research

Similar type of research could be conducted in large scale firms. Future research can also be conducted by taking into preview other functions that could be performed by TMS. Moreover, the similar study could be considered for medium and large scale units operating in the other parts of the country.

References

Black, W. R. (2001). An unpopular essay on transportation. *Journal of Transport Geography, 9,* 1-11.

Dess, G. G., Lumpkin, G. T., & Covin, J. G. (1997). Entrepreneurial strategy making and firm performance: Tests of contingency and configurational models. *Strategic Management Journal*, *18*(9), 677-695.

Field, A. P. (2004). *Discovering statistics using SPSS for windows* (pp. 619-672). London: Sage Publications.

Gordon, L. A., & Narayanan. (1984). Management accounting systems, perceived environmental uncertainty and organisational structure: An empirical investigation. *Accounting, Organisations and Society*, *19*(1), 330-348.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (pp. 87-115). New Jersey: Prentice Hall.

Monczka, R., Trent, R., & Handfield, R. (2005). *Purchasing and supply chain management*. Mason, OH: Thomson South-Western.

Pedersen, E. L., & Gray, R. (1998). The transport selection criteria of Norwegian exporters. *International Journal of Physical Distribution & Logistics Managemen*t, *28*(2), 108.

Reimann, B. (1989). Sustaining the competitive advantage. *Planning Review, 17,* 30-39.

Russell, R., & Taylor, B. (2003). *Operations management*. Prentice-Hall, Upper Saddle River, NJ.

Tolley, R. S., & Turton, B. J. (1995). *Transport Systems, Policy and Planning: A Geographical Approach*. Harlow, UK: Longman Scientific.