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Factors Influencing Transportation Mode in Small Manufacturing Firms

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ABSTRACT

Transportation management accounts for major costs in small manufacturing firms but on the contrary it is vital for successful operations of any firm. There are some factors which influences transportation mode as the product manufactured at one place is globally required, so role of transportation becomes crucial. The present study highlights the factors influencing transportation mode in 44 small scale units operating in district Udhampur of J&K State. The research framework was examined by empirical analysis of primary data collected. Validity and reliability of the scales in the construct were assessed through BTS and Cronbach-alpha. The results of ranking table revealed that transportation cost was the main factor that influences transportation mode and vehicle cost is the main cost that affects transportation decisions.

Keywords : Transportation, Supply Chain, effectiveness, Small Scale Industries (SSIs)

INTRODUCTION

Transport system makes products movable through timely and regional efficacy for promoting value-added under the least cost principle. Transport affects the results of logistics activities and influences production & sale. Value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more and therefore it is more regarded. Transportation design and networks results in supply chain effectiveness by lowering inventory moving timely inbound goods from supply sites to manufacturing facilities plant efficiencies and delivering quality products to customers in an cost efficient manner (Giuliano and Narayan, 2003).

REVIEW OF LITERATURE

Research on transportation issues succeeded after the mid-1980s and took a somewhat sclerotic approach from basic spatial interaction models to more sophisticated network approaches to cost effective movement of goods across space and time (Knowles, 1993 and Black, 2003). The role that transportation plays in supply chain management can take effect only through high quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. It brings efficacy and builds a bridge between producers & consumers. Therefore, transportation is the base of efficiency & economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness. Transportation design and network planning includes all functions and sub-functions into a system of goods movement in order to minimize cost, maximize service to the customers which contributes to the concept of business logistics. The system, once put in place, must be effectively managed (Ewing, et al., 2003). The present study put emphasis on the factors influencing transportation mode of 44 small scale industries operating in District Udhampur of J&K State.

RESEARCH METHODOLOGY

Research design and methodology comprises area of re-search, nature of data/information (Primary or secondary), questionnaire/schedule, research tools applied etc. The research methodology adopted proceeds as follows:

Sampling and data collection

The primary data for the study were collected from 44 functional manufacturing SSIs registered under District Industries Centre (DIC), Udhampur of J&K State sub-divided into ten lines of operation comprising 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 Survey Instrument

Information was collected by administering self developed questionnaire prepared after consulting experts and review of literature which comprised of general information and 30 statements originally kept in the domain of transportation management. Statements in the questionnaire were in descriptive form, ranking, dichotomous, open ended and five -point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree. Collection of data

The primary data were collected by making three to four visits for getting response from respondents. Census method was applied for collecting data from the respective respondents. The secondary information was collected from various sources namely books, empirical papers from online & hard copies of journals. Various multivariate tools such as Mean, standard deviation were used for drawing meaningful inferences.

Reliability and validity of the instrument

Reliability: Five factors were obtained after scale purification falling within the domain of transportation management in supply chain management. The Cronbach's reliability coefficients for all 22 scale items underlying five factors ranges from 0.652 to 0.852. The alpha reliability coefficients for F1 (0.852), F2 (0.809), is higher than the criteria of 0.77 obtained by Gordon and Narayanan (1984) indicating high internal consistency. F3 (0.769), F4 (0.652) and F5 (0.704) are also at a minimum acceptable level of 0.50 as recommended by Brown et al. (2001) and Kakati and Dhar (2002) thereby obtaining satisfactory internal consistency. However, the overall alpha reliability score for all factors is very much satisfac-

tory at 0.757. Adequacy and reliability of sample size to yield distinct and reliable factors is further demonstrated through Kaiser-Meyer-Olkin Measure of Sampling Adequacy that is 0.599 and all factor loadings between items and their respective constructs being greater than equal to 0.55.

Validity: The five factors obtained alpha reliability higher & equal to 0.50 and KMO value at 0.599, indicating significant construct validity of the construct.

DATA ANALYSIS AND INTERPRATATION

The suitability of raw data for factor analysis obtained from SSI managers was examined through Anti-image, KMO value, Bartlett's Test of Sphercity (p-value = 0.000), Principal Component Analysis and Varimax Rotation (Stewart, 1981) indicating sufficient common variance and correlation matrix (Field, 2000). On seventh round, the KMO value (0.599) and Bartlett Test of Sphercity (624.049) indicated acceptable and significant values. The process of R-Mode Principal Component Analysis (PSA) with Varimax Rotation brought the construct to the level of 22 statements out of 30 statements originally kept in the domain of transportation management. Therefore, factor loadings resulted into five-factor solution using Kaiser Criteria (i.e. eigen value ≥1) with 71.21% of the total variance explained, i.e. 22 items got grouped in five factors. The communality for 22 items ranged from 0.59 to 0.88, indicating moderate to high degree of linear association among the variables. The factor loading ranges from 0.585 to 0.905 and the cumulative variance extracted ranges from 18.98 to 71.21 percent.

Table 1.1 avows the four factors influencing transportation mode in 44 small manufacturing firms operating in district Udhampur of J&K State. These 44 small manufacturing firms have been divided into ten lines of operations 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 factors taken into consideration were "Easy availability", "Reliability", "Flexibility" and "Cost". Transportation costs influences most as it scored the mean value (2.1) and highest rank. "Easy availability" is accorded rank second, "Reliability" third and "Flexibility" as rank fourth. Thus, transportation cost exerts influence on the selection of transportation mode. The ranking categorization is done as follows:

As far as "Easy availability" of transportation is concerned two group of firms namely: cements & Pesticides/Insecticides accorded rank one to it followed by Battery/Lead/Alloy, Conduit pipes, Steel & Atta/Maize/Dal mills which assigned rank two to easy availability. The units that consigned rank three were Menthol, Guns, Gates/Grills/Varnish/Paint and 11 other units operating under the head miscellaneous. The overall mean score of this factor is ranked two.

As for "Reliability" factor is concerned only one group of firms namely Battery/Lead/Alloy assigned rank one to this factor. The other firms that assigned rank two to this factor were Menthol, Gates/Grills/Varnish/Paint & Miscellaneous. Those accorded rank three to the factor were Cement, Conduit pipes, Steel & Atta/Maize/Dal mills group. Pesticides/Insecticides & Guns units allotted rank four to the said factor. The overall mean score and rank of this factor is three.

The third factor taken into consideration was "Flexibility". The ranking process of this factor was that most of the firms/units assigned rank four to this factor, these units were Cement (8), Conduit pipes (2), steel (3), Gates/Grills/Varnish/Paint (5), Atta/Maize/Dal mills (3) & Miscellaneous (11). Those accorded rank three to this factor were Battery/Lead/Alloy (5), Pesticides/Insecticides (3). Two firms i.e. Menthol (2) & Guns (2) consigned rank one to the aforesaid factor. The overall mean score of this factor was Four.

The last and the main factor taken into consideration was "Transportation cost". Five group of firms namely, Conduit pipes, Steel, Gates/Grills/Varnish/Paint, Atta/Maize/Dal mills & Miscellaneous assigned rank one this factor. Three groups of firms i.e. Cements, Pesticides/Insecticides & Guns accorded rank two to the said factor. Only two units Pesticides/Insecticides & Menthol allotted rank four to this factor. So, transportation cost came out to be the main factor that influences the transportation mode of the small manufacturing firms as represented by its mean score i.e. one.

CONCLUSION

Proper transportation management emphasises on numerous activities such as distance & time traveled, trip making frequency, mode choice and fuel consumption. The present study reveals that transportation cost was the main factor that influences transportation mode. Thus, transportation cost exerts influence on the selection of transportation mode. The findings of the study is limited to small scale industries of district Udhampur of J&K State, so results drawn cannot be generalized for medium or large scale industries functioning in other parts of country having dissimilar business environment.

Table 1.1: Factors Influencing Transportation Mode

Units/Factors	Easy availability	Reliability	Flexibility	Cost
Cement	2 (I)	2.3 (III)	3.2 (IV)	2.2 (II)
Battery/Lead/Alloy	2.6 (II)	1.8 (I)	2.7 (III)	3 (IV)
Pesticides/Insecticides	1 (I)	3 (IV)	2.6 (III)	2.3 (II)
Conduit pipes	2 (II)	3 (III)	4 (IV)	1 (I)
Menthol	3 (III)	2 (II)	1 (I)	4 (IV)
Guns	2.5 (III)	3 (IV)	2 (I)	2.5 (II)
Steel	2.6 (II)	2.6 (III)	4 (IV)	1 (I)
Gates/Grills/Varnish/Paint	2.6 (III)	2.4 (II)	2.8 (IV)	2.2 (I)
Atta/Maize/Dal mills	2 (II)	3.3 (III)	3.6 (IV)	1 (I)
Others (Miscellaneous)	2.5 (III)	2 (II)	3.2 (IV)	1.9 (I)
Mean & Rank	2.2 (II)	2.5 (III)	2.9 (IV)	2.1 (I)

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

REFERENCES

• Black, W.R. (2001), "An Unpopular Essay on Transportation", Journal of Transport Geography, Vol. 9, pp. 1-11. | • Black, W.R. (2003), Transportation: A Geographical Analysis, New York, Guilford. | • Ewing, R., Pendall, R. and Chen, D. (2003), "Measuring Sprawl and its Transportation Impacts", Transportation Research Record, No. 1831, pp. 175-183. | • Field, A.P. (2004), "Discovering Statistics Using SPSS for Windows", London, Sage Publications, pp. 619-672. | • Giuliano, G. and Narayan, D. (2003), "Another Look at Travel Patterns and Urban Form: The US and Great Britain", Urban Studies, Vol. 40, pp. 2295-2312. | • Gordon, L.A. and Narayanan, (1984), "Management Accounting Systems, Perceived Environmental Uncertainty and Organisational Structure: An Empirical Investigation", Accounting, Organisations and Society, Vol. 19, No. 1, pp. 330-348. | • Knowles, R. (1993), "Research Agendas in Transport Geography for the 1990s", Journal of Transport Geography, Vol. 1, pp. 3-11.