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Assuring Business Excellence with the Aid of Effective Transportation Management

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Abstract

The paper presents an evaluative analysis of business excellence with the assistance of effective transportation management and control.The study was conducted on 152 wholesalers operating in district Udhampur of J&K state. The respondents were contacted through snowball referral sampling resulting into an effective response rate of 83.55%. The research platform was developed and carried out by empirical analysis with the assistance of primary data collected by field surveys. BTS and Cronbach-alpha were used to assess and validate the reliability of the scales in the data construction form. Factor analysis of the data was done and after its proper purification and validation it was analysed with abet of assorted multivariate tools. The results of hierarchal regression model and ANOVA revealed that proper transportation management leads to maximisation of customer service, proper transportation management assists in reducing warehousing costs, improper transportation management affects prices of products in the market, effective transportation management results in placing right product at right time in the market and respondents belonging to different age group differs with regard to adaptation of transportation management techniques.

Keyword: Transportation, Management, Wholesalers, Business

Introduction

Effective transportation management now a days reckons the business performance and incorporates new living and sustainment in the existing business. It is even recognised that transportation takes up one-third of the amount in the logistics costs and transportation systems influence the performance of the entire business and marketing efforts hugely. Transporting is recognised as catalyst in the whole production procedures, from manufacturing to distribution of goods to the end consumers and returns. Transportation plays a pivotal role in marketing and business preview rather than just carrying goods from place to place. High quality management can be ensured by developing a well-handled transport system, goods could be sent to the right place at right time inorder to satisfy customers' demands and ensuring business success. It brings efficacy, covering of more market platforms, builds bridge between producers and consumers, global distribution of goods and enriches product acceptance. Transportation is regarded as the base of efficiency and economy in business operations which brings benefits not only in terms of service qualitybut also to enhance company competitiveness. With the growth of technologies and economies many companies have to adopt and adjust their sourcing strategy to a more global platform which cannot be fulfilled without transportation (Christopher *et al*., 2011). So transportation has became more sophisticated and globalised, transport geographers are cuddling new ways of making transportation compatible at local, national and global scales (Tolley and Turton, 1995). Transportation only leads to make decisions regarding which consumer markets to enter, which suppliers to buy from, and which country to locate in (Arvis *et al.*, 2007). According to the World Bank (Raven, 2001), countries with the minimum cost and delay to legitimate cargo attract direct foreign investors to establish importing, production and distribution facilities. Some of the consequent benefits are increased employment and strengthened competitiveness in world markets. As a consequence, there has been a considerable increase in the means and number of transport modes to cater the needs of entire world markets (Black, 2001). Transportation system really places the right product at the right place (Carter andFerrin, 1995) and affects logistics activities, production, sales of the business.Anyhow, transportation design and networks results in supply chain effectiveness

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by lowering inventory (Barrett, 1998), facilitate the flow of goods over borders and to destination (Lawrence et al., 2010), increased demand (Skjoett-Larsen, 2000), plant efficiencies and delivering quality products to customers in an cost efficient manner (Giuliano and Narayan, 2003). Therefore, transportation management is a system designed to manage transportation operations.

Wholesaler

A wholesaler is an intermediary in the supply chain who holds the position of selling goods to the next immediate intermediary entitled as retailer. He is a middleman or channel partner/member who sells mainly to retailers and institutions rather than consumers.Wholesalers generally buys in bulk from the manufacturers and sells in parts to the retailers, intensive distribution of goods is done by wholesalers only. They take the whole headache of the manufacturers to sell their goods. Wholesaling, jobbing, distributing is often quoted as sale of goods or merchandise to retailers, industrial, commercial, institutional or other professional business users or to other wholesalers and related subordinated services. In general, it is the sale of goods to anyone other than a standard consumer. A wholesaler possesses profuse knowledge regarding new arrivals and existing modifications and alterations of goods from the manufacturers on the one hand and on the other he is well aware of customers' existing tastes and preferences as he avails such privilege from the retailers who are last link in the channel relationships and are supplying such timely information to the wholesalers. Wholesalers further can disseminate such information to the manufacturers who can cater the goods according to the needs of the customers. So, wholesalers are repositories or vessels of rich information from the upstream and downstream channel.

Review of Existing Literature

Research on transportation management issues is lacking in existing literature and merely it started in the mid-1980s. Numerous academicians, scholars, industrialists took initiatives to work on the dimension transportation management and came up with somewhat sclerotic approach. Previous studies in this area have considered undue handling due to border-crossing operations and too much change in transportation modes that have taken placefrom basic spatial interaction models to more sophisticated network approaches (Chopra and Sodhi, 2004). The responsibility that transportation plays in logistics paradigm and supply chain management system is more complex than just carrying up of goods for the proprietors, but it had enhanced to transporting the goods in an cost effective manner athwart universe, demand and time (Knowles, 1993; Black, 2003). By apt qualitative and well-knobbed transport management system goods could be rightly placed at right timefor gratifying customers' demands, needs and desires, building efficacy and economy in order to accentuate more and more of customers, rationalizing the marketing function as marketing is incomplete without transportation, performs logistics activities, enriches company competitiveness and abets in bridging gap between producers and consumers (Schoenherr *et al.*, 2008). Effectual transportation design, system and network planning embraces cost minimisation, quality customer service and ultimately contributes to attain excellent business logistics platform (Ewing *et al.*, 2003). The present study notifies the business excellence with the assistance of effective transportation management. The study is conducted in district Udhampur of J&K state on 152 wholesalers who are selling the products of small manufacturing firms operating under SIDCO & SICOP.

Testable Hypotheses

On the basis of in-depth analysis of existing review of literature and its meaningful conclusions, the following hypotheses had been emerged in order to make the study more reliable and responsive. The main hypotheses are:

Hyp 1: Proper transportation management leads to maximisation of customer service.

Hyp 2: Proper transportation management assists in reducing warehousing costs.

Hyp 3: Improper transportation management affects prices of products in the market.

Hyp 4: Effective transportation management results in placing right product at right time in the market.

Hyp 5: Respondents belonging to different age group differ with regard to adaptation of transportation management techniques.

Objectiveof the Study

The main objective of the study is to analyse the success of business with the assistance of effective transportation management.

Research Design and Methodology

The crux of research is based of research design and methodology which includes research area (where the research work is carried out), nature of data/information (primary or secondary), construction of data collection form (questionnaire/schedule), research tools applied etc. The research methodology adopted proceeds as follows:

Sampling and data Collection

The study was conducted with the help of primary data collected. For collecting the primary data, field surveys were conducted and 152 wholesalers operating in district Udhampur were contacted as per the prescriptions of the manufacturers (manufacturers were asked to mention their wholesalers operating in district Udhampur of J&K state). Only those wholesalers were contacted who were selling and marketing the products of small scale industries operating in the district Udhampur and in order to arrive at supply chain management concert. The present study pursued an in-depth analysis of the wholesalers who were the main respondents and subject of study. 152 respondents (wholesalers) were contacted for the study out of which 127 wholesalers responded giving an effective response rate of 83.55% which is representation of valuable response. Their response catalyzed the fundamental for drawing momentous conjecture.

Sampling Technique Applied

Snowball/referral sampling was used for obtaining data from wholesalers. Only those wholesalers were contacted who were using/selling/dealing with the products manufactured by the small scale units. Thewholesaler's classification under different heads as per small scale industries products is: cement (12 wholesalers), pesticide (12 wholesalers), steel (12 wholesalers), battery/lead/alloy (12 wholesalers), menthol (1 wholesalers), guns (3 wholesalers), conduit pipes (2 wholesalers), gates/grills/varnish (15 wholesalers), maize/atta/dal mills (22 wholesalers) and miscellaneous (30 wholesalers). Some of the major wholesalers contacted were,M/S Durga Bhagwati Traders, M/S Raj Battery Corporation, Kalsotrahardwares, M/S DBN Traders, M/s Swastik Enterprises, M/S Binothia Hardwares, Allied Agencies, Devika Agencies, Samgam Automobiles, M/S Inder Medical, Gupta hardware, ESS ESS Traders etc.

The Survey Instrument

A self-developed questionnaire was prepared which consisted of general information and 12 statements related to transportation management and control. The questionnaire was prepared with the assistance and consultancy of numerous experts, professors, academicians, industrialists, general public etc. and by extensive literature review.The questionnaire comprised of statements which were in the form of descriptive questions, ranking, open ended, dichotomous, tabular form, specific and five -point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree. Thisformulated questionnaire was administered to the respected respondents (wholesalers) for gathering relevant information.

Collection of data

The primary data were collected by making surveys in actual field i.e. by actually contacting/making three to four visits for getting true response from respondents. Snowball/referral sampling method was applied for collecting data from the respective respondents because only those respondents were required to be contacted who were dealing and selling the products of small manufacturing units operating under SIDCO and SICOP in Udhampur District (J&K State). The secondary information was collected from various sources namely referred journals, books and edited books, empirical research papers from online journals and print journals. Diverse multivariate tools such as mean, ranking, standard deviation, regression and ANOVA were used to test hypotheses and for drawing consequential deductions.

Reliability and validity of the instrument

Reliability: After applying rotated component matrix**,** the Cronbach's alpha value of 0.9882 for all 7 scale items

represented reliability which was higher than the criteria of 0.77 obtained by Gordon and Narayanan (1984) indicating high internal consistency and reliability. Further, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (0.912) confirmed adequacy and reliability of sample size to yield distinct and reliable factors with all factor loading values of items being greater than equal to 0.55.

Validity: Satisfactory KMO value (0.912) indicates significant construct validity of the construct (Hair *et al*., 1995).Further, the factors attained alpha reliability higher to 0.50 indicating construct validity.

Data Analysis and Interpretation

Anti-image, KMO value, Bartlett's Test of Sphercity and (p-value = 0.000)are used to examine the suitability of raw data for factor analysis which was acquired from wholesalers. The values indicated sufficient common variance and correlation matrix (Dess *et al.*, 1997; Field, 2000). The process of R-Mode Principal Component Analysis (PSA) was applied with Varimax Rotation which educed 7 statements out of 12 statements that were originally kept in the construct/domain of transportation management. The KMO value (0.912) and Bartlett Test of Sphercity (2143.614) indicated high satisfactory and noteworthy values. Therefore, factor loadings emerged reliable with conformist criteria which resulted into good factor solution using Kaiser Criteria (i.e. eigen value ≥1) with 49.642% of the total variance explained. The communality for 7 items of transport management ranges from 0.925 to 0.969, indicating good amount of linear association among the variables. The factor loadings range from 0.862 to 0.898 and the cumulative variance extracted is 49.64%. The factor and its statements emerged is displayed in the Table 1. A brief description of factor and its statements emerged are as under:

Factor (Effective Transportation)

The seven items underlying this factor consisted of: **"**Effective transportation maximises customer service", "Proper transportation network improves plant efficiencies", "Effective transportation design reduces warehousing costing", "Transportation affects prices of products in markets", "Effective transportation design results in lowering inventory costs", "Transportation design places right product at the right time" and "Leads to improved safety and social regulations". The mean values ranges from 4.54 to 4.59 representing significant values. The factor loadings fluctuate within .862 to .898. The factor loadings for each statement is: Effective transportation maximises customer service (.898), Proper transportation network improves plant efficiencies (.896), Effective transportation design reduces warehousing costing (.896), Transportation affects prices of products in markets (.896), Effective transportation design results in lowering inventory costs (.895), Transportation design places right product at the right time (.895) and Leads to improved safety and social regulations (.868). The statement "Effective transportation maximises customer service" emerged with highest factor loadings and the statement "Leads to improved safety and social regulations" emerged to be the weakest among all with low factor loading. The communalities varied from .925 - .969indicating significant values and high degree of linear association among the variables. The communalities for each statement is:Effective transportation maximises customer service (.925), Proper transportation network improves plant efficiencies (.926), Effective transportation design reduces warehousing costing (.969), Transportation affects prices of products in markets (.969), Effective transportation design results in lowering inventory costs (.938), Transportation design places right product at the right time (.938) and Leads to improved safety and social regulations (.958). Two statements "Effective transportation design reduces warehousing costing" and "Transportation affects prices of products in markets" enriched with highest communalities and the statement "Effective transportation maximises customer service" emerged to be the weakest but communalities of all variables indicated significant values for the construct. The basic purpose of wholesalers is to maintain independence of operations with meeting variation in product demand. It further assists in placing the right product at the right time.

Mean response of Wholesalers Regarding Transportation Management

Table 2 displays mean response of wholesalers with regard to transportation management. The wholesalers perception regarding transportation management fluctuates between 4.54 – 4.59. The statement "Proper transportation network improves plant efficiencies"emerges to be strongest with mean value 4.59 and the statement "Leads to improved

safety and social regulations"as the weakest with mean value 4.54. The overall mean values for all 7 statements among retailers' are 4.56. Thus it can be concluded that wholesalers have high internal congruity and business turnover and focus more on optimal transportation to meet demand of ultimate customers.

Age Profile of Wholesalers

Portraying wholesalers profile regarding age factor, it is envisaged that between age group 20-30 years there were 14 wholesalers who were considered as young wholesalers and were using contemporary means of storing and disseminating goods thereby maintaining harmonious supply chain management platform. There were 34 respondents between age group of 31-40 years, who were the major chunk of sample population and represented second young group. 41 wholesalers of the total were among the age group 41-50 years having good amount of experience and having retained and strong supply chains. 32 from the wholesalers belonging to age group of 51-60 years were 32 in number who are having rich and wider market experiences and lastly 6 wholesalers were of above 60 years having affluent experience and shared valuable knowledge regarding supply chain management with special focus on transport management and control in order to bring economy and efficiency regarding product availability and smooth market functioning (Table 3).

Regression Analysis

Table 4 avows output from regression analysis to draw out the impact of transportation management on customer service.The result of linear regression analysis (Table4) enticed that the correlation between predictor and outcome is positive with value of R as .896, which signifies good correlation between predictor and the outcome. Model 1indicated good association between dependent and independent variable as value of R is .896 which contours 89% association between dependent and independent variable. R-Square for this model is .746 which means that 74% of variation in transportation management can be explained from the independent variable. Adjusted R square (.674) indicates that if anytime another independent variable is added to model, the value of R-square will increase.The beta value also supports and signifies the established relationship of independent variable with dependent variable.Change in R square is also found to be significant with F-values significant at 5% level of confident. Thus the hypothesis "Proper transportation management leads to maximisation of customer service" is accepted as represented by its significance level $p < .05$.

Simultaneously, Table 5 illustrates output from regression analysis to educe the impact of transportation management on reducing warehousing costs.The result of linear regression analysis (Table5) came out with value of R as .840 which conveyed that the correlation between predictor and outcome is positive with good acceptance and significance. The model of linear regression exhibited value of R as .840 which divulges 84% association (good association) between dependent and independent variable. R-square for this model is .719 which means that 71% of variation in transportation management can be explained from the independent variable. Adjusted R square (.616) indicates that if anytime another independent variable is added to model, the value of R-square will increase. The beta value also supports and signifies the established relationship of independent variable with dependent variable.Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Proper transportation management assists in reducing warehousing costs"is accepted as represented by its significance level $p < .05$.

Table 6 demonstrates output from regression analysis to extract the impact of transportation management on price fluctuations.The result of linear regression analysis (Table6) beguiled that the correlation as represented by value of R (.910)is positive and significant between predictor and outcome. 91% association between dependent and independent variable was found in the regression model which is considered as rich and extreme association. R-square of the model is .813 which means that 81% of variation in transportation management can be explained from the independent variable. Adjusted R-square (.761) indicates that if anytime another independent variable is added to model, the value of R-square will increase.The beta value also supports and signifies the established relationship of independent variable with dependent variable. Change in R square is also found to be significant with F-values significant at 5% confidence level.Thus the hypothesis "Improper transportation management affects prices of products in the market"is accepted as represented by its significance level $p < .05$.

Table 1: Results Showing Factor Loadings and Variance Explained After Scale Purification (Rotated Component Method) for Transportation Management (Wholesalers' Perceptions)

Factor-wise Dimensions	*Mean*	*S.D*	*F.L*	Eigen Value	Variance Explained %	Cumulative Variance %	Comm-unality	*α*
Effective Transportation	4.56	.497		14.513	49.642	49.642		**.9882**
Effective transportation maximises customer service	4.58	.496	.898				.925	
Proper transportation network improves plant efficiencies	4.59	.494	.896				.926	
Effective transportation design reduces warehousing costing	4.55	.500	.896				.969	
Transportation affects prices of products in markets	4.55	.500	.896				.969	
Effective transportation design results in lowering inventory costs	4.58	.496	.895				.938	
Transportation design places right product at the right time	4.58	.496	.895				.938	
Leads to improved safety and social regulations	4.54	.501	.862				.958	

Footnotes: KMO Value =.912; Bartlett's Test of Sphercity = 2143.614, df= 190, Sig. =.000; Extraction Method Principal Component Analysis; Varimax with Kaiser Normalisation; Rotation converged in 4 iterations; 'FL' stands for Factor Loadings, 'S.D' for Standard Deviation and 'α' for Alpha.

Table 2: Mean Rating of Wholesalers Regarding Transportation Management

Statement	*Wholesalers*
Transportation Management	Mean
Effective transportation maximises customer service	4.58
Proper transportation network improves plant efficiencies	4.59
Effective transportation design reduces warehousing costing	4.55
Transportation affects prices of products in markets	4.55
Effective transportation design results in lowering inventory costs	4.58
Transportation design places right product at the right time	4.58
Leads to improved safety and social regulations	4.54
Total	4.56

Table 3: A Brief Profile of Wholesalers Age

S.No.	*Variables*	*Classification*	*Frequency*
1.	Age	20 - 30 years	14
		31 – 40 years	34
		41 – 50 years	41
		51 – 60 years	32
		Above 60 years	6
	Total		127

Table 4: Regression Model Summary

Model	*R*	R^2	*AdjustedR*^{2}	*Std. Error of Estimate*	*Fvalue ANOVA*	*Sig.* level	*β*	t	Sig. level
1.	.896	.746	.674	.2764	54.109	.000	.267	17.876	.000

a. Predictors: (Constant), Maximises customer service
b. Dependent Variable: Transportation management

Table 5: Regression Model Summary

Model	*R*	R^2	*AdjustedR*^{2}	*Std. Error of Estimate*	Fvalue ANOVA	Sig. level	*β*	t	Sig. level
1.	.840	.719	.616	.3412	58.128	.000	.864	10.931	.002

a. Predictors: (Constant), Reduces warehousing costing
b. Dependent Variable: Transportation management

Table 6: Regression Model Summary

Model	*R*	*R2*	*AdjustedR2*	*Std. Error of Estimate*	*Fvalue ANOVA*	*Sig. level*	*β*	*t*	*Sig. level*
1.	.910	.813	.761	.5713	66.321	.000	.953	15.634	.000

a. Predictors: (Constant), Affects prices of products in markets
b. Dependent Variable: Transportation management

Table 7: Regression Model Summary

Model	*R*	*R2*	*AdjustedR2*	*Std. Error of Estimate*	*Fvalue ANOVA*	*Sig. level*	*β*	*t*	*Sig. level*
1.	.944	.861	.809	.6593	67.432	.000	.990	17.931	.000

a. Predictors: (Constant), Places right product at the right time
b. Dependent Variable: Transportation management

Table 8: ANOVA for Age

Description of Age	*Nature of Variable*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
20 - 30 yrs	Between Groups	2.844	4	.711	3.246	.017
31 – 40 yrs	Within Groups	15.115	123	.219		
41 – 50 yrs	Total	17.959	127			
51 – 60 yrs						
Above 60 yrs						

Table 7 exaggerates output from regression analysis to obtain the impact of transportation management on placement of right product at the right time.The result of linear regression analysis (Table7) revealed that the correlation between predictor and outcome is positive with R value of .944 and entices high and valuable correlation between predictor and the outcome. In regression model 1, value of R is .944 which indicates 94% association between dependent and independent variable. R-square exhibits value of .861 which means that 86% of variation in transportation management can be explained from the independent variable. Adjusted R-square (.809) indicates that if anytime another independent variable is added to model, the value of R-square will increase. The beta valuealso supports and signifies the established relationship of independent variable with dependent variable. Change in R-square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Effective transportation management results

in placing right product at right time in the market"is accepted as represented by its significance level $p < .05$.

One Way ANOVA

ANOVA(Analysis of Variance) was applied to experiment the last hypotheses. To test this hypothesis,wholesalers' age is taken into consideration. For making the study easier and comparative, the age of wholesalers had been classified into five categories viz., 20 - 30 years, 31-40 years, 41-50 years, 51-60 years and above 60 years. The result of ANOVA (Table 8) depicts that respondents belonging to different age group differs with regard to adaptation of transportation management techniques as the *p* value is less than .05 ($p < .05$, Sig. .017). Therefore, the last hypothesis is also accepted (Table 8).

CONCLUSION

The study is competitive as well as comparative in nature as its study of small scale industries which are generally compared with large market layers. The study enticed with significant results and findings as it takes into preview the wholesalers' perspective and their response which matters a lot in formulating and establishing a strong supply chain management and control. The role that transportation management plays in context of wholesalers provides new insights to the existing studies in terms of the facts that effectual transportation management results in meeting customers'demands timely and judiciously, targeting diverse customersand sustaining them and ultimately positioning products in varied markets to avail selling opportunities. The present study's findings support all the formulated hypotheses and reveals that transportation management leads to maximisation of customer service, proper transportation management assists in reducing warehousing costs, improper transportation management affects prices of products in the market, effective transportation management results in placing right product at right time in the market and further it was seen that respondents belonging to different age group differs with regard to adaptation of transportation management techniques.Practically, trade shows, internships, meetings, seminars, workshops, conferences initiatives must be taken by the government in order to brace supply chain management control and linkages by amalgamating bitty Supply chain members/partners with the assistance of wholesalers. In order to bring equilibrium in demand and supply platform with the assistance of apt transport management system wholesalers needs to be apprenticed through periodic training andfree education programmes so that they can avail the privilege of various outstanding strategies for lucrative transportation management decisions. The study is limited to the wholesalers operating in district Udhampur of J&K state, so the findings /results of the study cannot be generalised for those wholesalers who are operating in other parts of the country with disparate environmental business conditions and situations. Further, future researches can concentrate on the dimension transportation management from the perspective of wholesalers and retailers for medium and large scale industries.

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