

## Key Processes Adopted For Transportation Management System In Small Scale Firms

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### ABSTRACT

*Transportation management system occupies an important place in the contemporary arena as it assists in the smooth, exact and qualitative movement of goods to the aspired destinations. The present research work highlights some of the key processes adopted for transportation management system in 44 small scale firms operating in District Udhampur of J&K State. The research framework was scrutinized by empirical analysis of first hand/primary data collected from the respective small scale firms managers. The variables taken into preview were "Planning & decision", "Transportation execution", "Measurement" and "Transportation follow-up". The results of the ranking table revealed that the variable "Planning & decision making" attained rank, "Transportation execution" attained rank second. Third rank is obtained by the variable "Measurement" and rank fourth was gained by the variable "Transportation follow-up". Further, the results of the linear hierarchal regression revealed that proper planning and decision making leads to effective transportation management system in small scale firms.*

**Key Words:** Transportation Management System (TMS), Small Scale Firms, Transportation.

### Introduction

Transportation today had made possible the existence of world markets in terms of globalisation, liberalisation. The market/marketing world exists because of transportation which further adds on by technically developing physical and electronic linkages. In present world the major costs contributing towards the price of the products are because of the packaging, warehousing, transportation

which amounts a lot in the overall costs. So transportation assists in transporting the raw materials etc to the place of production and even transporting the finished goods to the final consumption point which in lieu assists in exchange of goods and services of home and host countries.

A transportation management system (TMS) is basically a compartment of supply chain management that is entirely

concerned with effective transportation management and transport operations which in turn is effectual subset of an enterprise resource planning system. A TMS lies between the enterprise resource planning and the warehouse/distribution unit. An effective transportation management system offers effectual routing solutions with the optimal decisions regarding both procurement and shipping/transportation orders. These solutions offer best route/mode to be decided by the user with the least possible cost. Once the user selects the best provider, an electronic load tendering is generated in order to trace the track for executing the optimized transportation/shipment with the carrier selected and further to support settlement process. Effective transportation management systems manage four key processes of transportation management which were considered for the present research purpose also:

- **Planning and decision making** – Under this the transportation management system will provide the most efficient transportation schemes which will include low transportation cost, fewer stops in order to ensure quality, short lead-time, flows regrouping coefficient, etc.
- **Transportation Execution** – Under this the transportation management system will execute the transportation plan while taking into consideration few points such as carrier rate acceptance, chosen carrier availability, carrier dispatching, EDI etc.

- **Transport follow-up** – Under this the transportation management system will start following the transportation operation: tracing of transport event time to time (shipping from A, arrival at B, customs clearance, etc.), editing of reception, custom clearance, invoicing and booking documents, sending of transport alerts (delay, accident, non-forecast stops...)
- **Measurement** – Under this the transportation management system will prescribe a key performance indicator (KPI) which will report every function for transport like productivity in monetary terms, productivity in operational terms, e.g. shipping units/order or weight/load.

So, Transportation Management System (TMS) entirely focus on transport logistics which further facilitate connections between an Order Management System (OMS) and the Warehouse/ Distribution unit (DU). The various other functions which are performed by an effective transportation management system are: Planning and optimizing of terrestrial transport rounds, Inbound and outbound transportation mode, transportation provider selection, Arrangement of carrier i.e. rail, air and roadways etc, Real time transportation tracking, and vehicle load with Route optimization etc.

## LITERATURE REVIEW

The transportation management research framework was promoted in the after the mid-1980s where the firms

enhanced from the traditional transportation models to more sophisticated network approaches with the effectiveness in terms of cost i.e. cost effective movement of goods across space and time (Knowles, 1993 and Black, 2001 & 2003). A well reputed transportation management system had to abide by many rules, norms, standards so that goods could be effectively sent from the place of production to consumption which is considered as the right place in order to measure transportation effectiveness which in lieu is encompassed with timely satisfying customers' demands. The base of business efficiency and economy lies in the hands of transportation management system adopted by businesses which expands other functions of logistics also. An effective transportation management system even brings in business competitiveness (Giuliano and Narayan, 2003).

Effective transportation management system even pertains and includes all the functions and sub-functions into a system of shipment of goods effectively and safely to the requested destination which includes cost minimization, service maximisation to users and numerous other logistics benefits. The transportation management system, once put in practice or once executed, must be successfully managed (Ewing, et al., 2003). The present study takes into consideration the various key processes adopted by transportation management system in 44 small scale firms operating in District Udhampur of J&K State.

## HYPOTHESIS FORMULATION

The following was the main hypothesis of the study:

*Hyp1: Proper planning and decision making leads to effective transportation management system in small scale firms.*

*Obj1: The objective is to analyse that whether proper planning and decisions assists in formulating and developing effective transportation management system in small scale firms..*

## RESEARCH DESIGN AND METHODOLOGY

The research methodology adopted for the study is as follows:

### Sampling and data collection

The sample for the study was chosen from the small scale firms operating in District Udhampur of Jammu & Kashmir State. There were registered firms under the DIC (District Industries Centre) Udhampur that were found operating under this pursuit. This area was chosen for research because of the research scarcity in this area. Proper and first hand information were collected from these 44 small scale units. There were total of 49 registered units under DIC out of which five of these were found non functional due to one reason or other. The 44 small manufacturing units were further categorised into similar ten lines of operations which is mentioned as: 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 (not falling in any category) category embraced 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. The primary data from these small scale 44 units were collected with the help of census method.

### **Research instrument**

Research instrument stands for data construction form. For the present study the research instrument was self developed with the assistance of existing literature and its content validity was checked by consulting the same with proficient academicians, industrialists, surveyors, research scholars. The research instrument contained questions regarding the general information of the respondents and some of transportation management system. The data collection form which is named as questionnaire comprised of ranking questions, dichotomous questions and five-point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree. Here in this study, ranking tables and linear regression were used in order to make the study elaborative for drawing meaningful inferences.

### **Data collection**

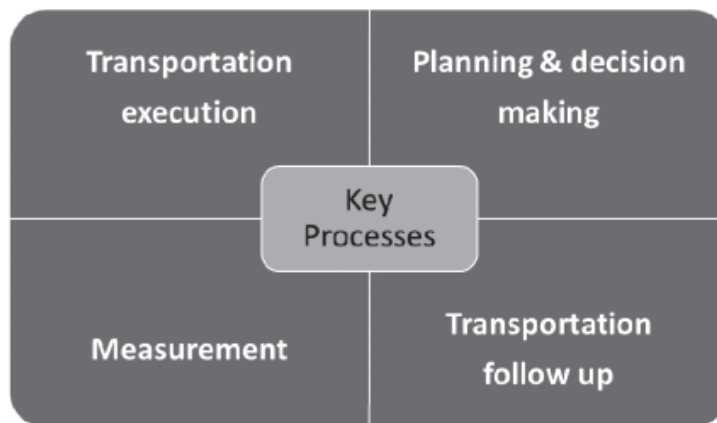
The data for the present research were collected with the assistance of self developed research instrument namely questionnaire. The first hand information basically known as primary information were collected with the help of the developed instrument. The response was collected from the small scale firms' managers who stood as respondents of the research. The response was gathered taking into preview the time feasibility of the respondents and duly approaching them for the research purpose. All ethical considerations were followed while collecting response from respective respondents. The data was collected through census method. The secondary source of data was also taken into consideration and reliable information was collected by different sources: internet, books and empirical papers from referred journals. In the present study only and only Ranking tables were used for eliciting consequential inferences.

### **DATA ANALYSIS AND RESULTS INTERPRETATION**

The data so collected from small scale firms' managers were portrayed in tabular form to make it more meaningful and understandable. Table 1 lays out the mean ranking of factors laying down the key processes adopted for transportation management system in these small scale operational units functioning in District Udhampur of J&K State. In District Udhampur, under DIC (District Industries

Centre) segregated into two main categories namely SIDCO & SICOP, there are 44 small manufacturing firms operating which had been mainly classified into ten lines of operations i.e. the small scale manufacturing units having analogous types of businesses are categorised into homogeneous 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 factors that were enlisted in order to track down the key processes adopted for transportation management system in these firms are “Planning & decision”, “Transportation execution”, “Measurement” and “Transportation follow-up”. Overall, the variable “Planning & decision making” attained rank one

among all the variables as this rank is accorded by almost all managers of these small scale registered firms. “Transportation execution” attained rank second. Third rank is obtained by the variable “Measurement” and rank fourth was gained by the variable “Transportation follow-up”. Overall mean response to the factors in descending order are 2.1 (Planning & decision making), 2.2 (Transportation execution), 2.5 (Measurement) and 2.9 (Transportation follow-up) respectively. The variables connoted that the processes so adopted by small scale firms justifiable for transportation management system. The following figure represents the various variables that determine the key processes for effective transportation management system:



*Figure showing the key processes with its various factors.*

The ranking of the key processes adopted for transportation management system in small scale firms is done as follows:

### **Cements**

The cements sector among the 44 small scale firms is the largest sector with eight prominent small scale firms named

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 enlisted as small scale firms. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned: these small scale firms accorded rank one to “Transportation execution” as it acted as the main factor for transportation management. “Planning & decision making” was accorded rank two by almost all the small scale units as accrued to be the second important factor to be considered if transportation management needs to be effective. “Measurement” was given rank three by these small scale cements firms and “Transportation follow-up” was positioned with rank four. Thus the ranking made by these firms ensured that “Transportation execution” is the prominent factor as it acted as the main/key process for effective transportation management.

### **Battery/ Lead/ Alloy**

The second category of the industry is given the name Battery/Lead/Alloy because of the similar or allied products produced and sold by this category of firms. The total number of units under this category was five and they were respectively named as Radha Industries, Pilot Batteries, Durga Batteries, Suraksha Batteries and Avtar Batteries. The mean ranking approved by these small competent units firms was: “Measurement” was given rank one by all the small scale

firms operating as it stood as the main factor that make transportation management effective. “Transportation execution” was accorded rank two amongst all the variables. The variable “Transportation follow-up” was endorsed rank three as it was that factor which determines transportation efficiency of the small firms. Accordingly, “Planning & decision making” awakened with rank four as represented in the table 1.

### **Pesticides / Insecticides**

The third main category encircling small scale firms is Pesticides/Insecticides. The three main well known market oriented firms operating under this category were: M/s Dhanuva Agritech Ltd., Safex Chemicals Ltd. and M/s Modern Insecticides. The mean ranking rendered by these small scale industries managers in respect of the key process adopted for effective transportation management in these small scale units is that these small scale firms fixed rank one to “Transportation execution” as it divulges that it determines the transportation effectiveness other areas also. Rank two was accorded to the factor “Planning & decision making” as it stood as the second main factor that assists in making transportation strategies effective in nature. Rank three was followed by the variable “Transportation follow-up” as it gives some glimpses of transportation effectiveness. The last and the fourth rank is devoted to “Measurement” which could be their last reason for adopting transportation processes.



### **Conduit pipes**

M/s Pee Kay Products and Rukhmani plastics were the two small scale competitive units under this category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, the variable "Planning & decision making" attained rank one amongst all the prominent factors under this group periphery. "Transportation execution" applauded with rank two and was given due recognition by conduit pipes. "Measurement" was allotted rank three. "Transportation follow-up" was agreed at rank four. The mean rankings of the variables ensured that these small scale operating units puts emphasis on Planning & decision making as to be main variable that seems to be the first step in deciding transportation management.

### **Menthol**

The menthol group comprised of M/s Harikripa Perfumes Pvt. Ltd. and M/s Mahadurga which were again quite competent small scale units. The ranking related to the process adopted for effective transportation management of these small units is as follows: "Transportation follow-up" was given rank one, "Measurement" emanated with rank two, "Transportation execution" was given rank three, and "Planning & decision making" was accorded rank four.

### **Guns**

This category comprised of only two competitors namely M/s Gulab Gun Factory and M/s Hunter Gun factory. The two units were in use of effective transportation medium. Both of them dispensed rank one to "Transportation follow-up" followed by "Planning & decision making" with rank two. "Transportation execution" was bestowed with rank three by both the units and "Measurement" was consigned rank four. The ranking is displayed in table 1.

### **Steel**

M/s Maha Luxmi Steel Fabricators, M/s Faqir Chand Sanak Raj and M/s Gupta Furniture were the three small scale competing units operating under this Industrial category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, the variable "Planning & decision making" was assigned rank one as it was declared to be first step in order to decide for effective transportation management. "Transportation execution" ranked two, "Measurement" ranked three and "Transportation follow-up" ranked four respectively.

### **Gates/ Grills/ Varnish/ Paint**

This group was found to be the advanced group and is the main group of the research. M/s Balaji Industries, M/s Wazir Engineering Works, ISRO Products, Shakti Engineering Works and

M/s Everest Paints were found operating under this category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, rank one by this group of small scale firms was devoted to "Planning & decision making". "Measurement" was given rank two by these units, "Transportation execution" was fixed with rank three, and "Transportation follow-up" was aligned rank four respectively (Table 1).

#### **Atta/ Maize/ Dal mills**

Shalimar Floor Mills, M/s Udhampur Dal Mills and M/s Sharda Enterprises were the three strong competitors operating under this esteemed category. So far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, "Planning & decision making" was consigned rank one by all the three strong competitors operating under the category. "Transportation execution" was elected for rank two by these small industrial units. "Measurement" was accorded rank three. "Transportation follow-up" was mentored rank four. It implies that atta/maize/dal mills small scale firms mainly concentrated on Planning & decision making for effective determination of transportation management processes as depicted in table 1.

#### **Others (Miscellaneous)**

There were eleven small scale competitive units operating under this miscellaneous category. The names of the

units that were operating under this group were 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. So far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, "Planning & decision making" was accorded rank one by most of the small scale units and "Measurement" was given rank two by almost all the small scale units operating, "Transportation execution" was appropriated rank three and "Transportation follow-up" was consigned rank four representing the actual figure of variables that enlists the key processes adopted for transportation management.

Overall, all the small scale firms operating under SIDCO & SICOP represents Planning & decision making as the key process for effective transportation management, followed by Transportation execution, subsequently after that Measurement and at the end by Transportation follow-up (Table 1).

#### **Regression analysis**

In order to test the research hypothesis, regression analysis was conducted for measuring the impact of proper planning and decision making on transportation management system. The linear regression model summary table



(Table 2) enticed with the value of R to be .780 which assures 78% alliance between dependent variable and the independent variable i.e. between proper planning and decision making on transportation management system,  $R^2$  value of .700 denotes that 70% of variation in transportation management system could be explained from the independent variable (proper planning and decision making). Adjusted  $R^2$  value .609 connotes the increase in the value of  $R^2$ , if anytime another independent variable is added to the existing independent variable. Further beta value reveals significant relationship of independent variable with dependent variable as depicted by its value. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis ***“Proper planning and decision making leads to effective transportation management system in small scale firms”*** is accepted as represented by its significance level  $p < .05$ .

## CONCLUSION

Transportation is considered as of vital importance as it assists in developing diverse markets, reduces remoteness among different countries and augments International trade. It assists in the proper distribution of wealth. The transport network routes are essential in a country as it assists in the economic progress. The present research connotes the mean ranking associated with the key processes adopted for transportation management

system in the small scale. The study takes into consideration some variables/factors which are quite appealing and praiseworthy as portrayed in the existing literature. The variable taken for the present study in order to identify the key processes adopted for transportation management system are: “Planning & decision making”, “Transportation execution”, “Measurement” and “Transportation follow-up”.

The present research conducted on the small scale 44 firms divulges the mean ranks accorded to these four variables by the managers of these small scale firms. The ranking were related to the key processes that were adopted by these small scale firms regarding effective transportation system. Overall, the variable “Planning & decision making” is assigned rank one by almost all managers of small manufacturing firms. “Transportation execution” attained rank second. Third rank is acquired by “Measurement” and rank four was stood by “Transportation follow-up”.

Overall mean response to the factors in descending order are 2.1 (Planning & decision making), 2.2 (Transportation execution), 2.5 (Measurement) and 2.9 (Transportation follow-up) respectively. Further linear regression model summary results exposed that proper planning and decision making leads to effective transportation management system in small scale firms as contoured by the respective significant values.

### Limitations of the study

The study is conducted in one area i.e. area specific, so the results of this study cannot have universal application as there could be diversity in other areas according to the environment and other factors associated.

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 avoided.

### Future research

Similar type of research could be conducted in large scale firms. Future research can also be conducted by taking into preview more than four factors that assists in mentoring the key processes adopted for effective transportation management system. Moreover, the similar study could be considered for medium and large scale units operating in the other parts of the country.

**Table 1:** Key Processes Adopted For Transportation Management System in Small Scale Firms

Units/Factors	Transportation execution	Planning & decision making	Measurement	Transportation follow up
Cement	2 (I)	2.2 (II)	2.3 (III)	3.2 (IV)
Battery/Lead/Alloy	2.6 (II)	3 (IV)	1.8 (I)	2.7 (III)
Pesticides/Insecticides	1 (I)	2.3 (II)	3 (IV)	2.6 (III)
Conduit pipes	2 (II)	1 (I)	3 (III)	4 (IV)
Menthol	3 (III)	4 (IV)	2 (II)	1 (I)
Guns	2.5 (III)	2.5 (II)	3 (IV)	2 (I)
Steel	2.6 (II)	1 (I)	2.6 (III)	4 (IV)
Gates/Grills/Varnish/Paint	2.6 (III)	2.2 (I)	2.4 (II)	2.8 (IV)
Atta/Maize/Dal mills	2 (II)	1 (I)	3.3 (III)	3.6 (IV)
Others (Miscellaneous)	2.5 (III)	1.9 (I)	2 (II)	3.2 (IV)
Mean & Rank	2.2 (II)	2.1 (I)	2.5 (III)	2.9 (IV)

**Note:** Where 1 denotes “highest rank” and 4 denotes “lowest rank”

**Table 2:** Regression Model Summary

Model	R	R <sup>2</sup>	AdjustedR <sup>2</sup>	Std. Error of Estimate	F value ANOVA	Sig. level	β	t	Sig. level
1.	.780	.700	.609	.2001	42.546	.000	.758	9.524	.011

a. Predictors: (Constant), Proper planning and decision making

b. Dependent Variable: Effective Transportation Management System

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