

## MATERIAL MANAGEMENT IN TRACTOR MANUFACTURING COMPANIES IN INDIA

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### ABSTRACT

*Perhaps for the Manufacturing companies the management of material is the most important aspect to achieve the higher productivity and profitability. In any of manufacturing entity material is the most valuable and larger item and constitute a major portion of the product, hence any negative shade in it will have significant impact on strength and competitive position of the entity. Without a proper Management of material strategy, it will be though for the entity to run economically due to high level of Material in stock and blocking of working capital. On the other side with the better material management a high and improved profitability can be achieved and in short term as well as in long term. So it is now needless to say that material management is an utmost important aspect of the manufacturing entities and Tractor Manufacturing industry is not at all an exception to this concept. This Research paper is intended to enlighten the material management in Tractor Industry based on various analysis and test conducted based on survey done and opinions obtained. Various explanatory and research methodology is used for data collection and analysis, opinion was analyzed statistically performed tests and results are concluded by rejecting null hypothesis and acceptance of alternate hypothesis. We concluded and found in research practice that there is far difference between the actual practices followed and knowledge of material management professionals and experts.*

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**Keywords:** *Material Management, Tractor Industry, Statistical Test, Suggestions.*

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### Introduction

Material Management is a system by which proper planning and controlling is done to ensure that right quality and Quantity of material is obtained, on timely basis i.e. when it is actually needed, at the reasonable cost. Material management becomes more important in case of project management because in that the entire project has to be completed within definite span of time. Without the proper management of material, all technical, commercial and operating expertise becomes useless and even after having a good, effective and efficient organizational structure, the desired results are not obtained. In today's world various statistical Techniques are used to manage material effectively to reduce the cost of inventory. The whole objective of Material management is to make a co-ordination between Planning, Procuring, transporting, storing and Handling the material, so that the cost can be reduced to an optimum level. In the present scenario where material is a scare resource, and day by day their increasing cost, making it crucial to manufacturers to adopt Material Management. In western countries or I developed countries material management is using since a long time with the intention to provide better product with better quality of material so to set up landmarks in Manufacturing, in india it is still not utilized with its full potential and a lot of development is yet to come in the picture. The reasons for the same could be various including the poor gentry who are the buyers and suppliers are not of that cooperative as they expected to be. Hence a lot of research work is required to be done to achieve that level of involvement of inventory or material management in Tractor Manufacturing industry. This research has been conducted with the intention to ensure an optimal decision making can be done relating to material procurement, transportation, storage and handling of the material, extracting and disposing off the waste and obsolete material and thus suggesting how an optimum level of Material Management can be achieved.

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### Review of Literature

A lot of Literature has already been written on this topic, however the same is on Material Management but not specific to Tractor Manufacturing companies. We have gone through with number of literature and few of them has been used to observe the facts and analysis.

**Swami H.R. (2014)** In this research paper the study of management of material in public undertaking specially in rajasthan such as instruments limited, HMT, Sambhar Salts Limited, Hindustan Zinc Limited etc. has been taken for study. The study has covered the different aspects of material management in these entities. The methodology which they used for research was questionnaire, Desk Work and other on the spot analysis. They found that around fifty percent of the total cost of production is in Material. However inspite of such a huge portion of inventory, still Techniques of Material Management has not been adopted for controlling investment in Material. Researcher has found that in these public units the Material Management is limited up to inspection of Material which is at all not sufficient. The Researcher has suggested that a separate department or function shall be set up for the which should be independent and autonomous. Also the administrative cost shall be reduced.

**Aggarwal S.K. (2016)** The Researcher has taken Bharat Heavy Electricals Limited (Bhopal Unit) for the purpose of their research on system of material management. His study has suggested the implementation of Always Better Control (ABC) analysis and Economic order Quantity (EOQ) method as automatic replenishment system for inventory control. He also point out the accumulation of surplus stock and non moving items including obsolete items shall be disposed off soon at the best price so that carrying cost can be reduced or eliminated and probable loss from non sale which could occur in future may be prevented. However what is excess quantity is decide by the entity as per their need and requirements of use of material. He stressed on monthly preparation of stock details and their reconciliation of stores ledger with accounts books, so that frauds and misappropriation in inventory can be prevented at early stage.

**Gupta P and Madan G (2014).** The researcher has selected the medical stores and cutting tool inventory as work of research. They suggested that Always Better Control (ABC) Technique and Vital, Desirable and Essential (VED) Techniques shall be used for the purpose of cutting inventory cost. They found a matrix of ABC-VED for analysis of Drug expenditure and cutting tools. They also stressed on selling of the unused and scrapped items and keep vacant the space from incurring the cost of rent and inventory handling cost. This is how productivity can be increased with reduced cost and higher profitability.

**Roa Sambasiva (2015).** The area of research in this research paper was Public Sector Ship Building industry. Researcher has observed that due to in business of heavy engineering products the problem is faced drastically in material management. Through documentary evidences and expert opinion they evaluate and suggested that the time involved between purchase of material and use of material (Also known as lead time) shall be reduced.

On going through the above literature, it is found that a number of research work done on this aspect but to have a detailed research to look into those aspects which remained untouched till date, a new research work is needed and hence this research paper "**Material Management in Tractor Manufacturing Companies In India**" has been written.

### Objective of Study

The prime objective of this study is:

- Examining the practices of Material Management in tractor manufacturing companies.
- To find the reasons of difference between Practices studied by Material Management Professional and Actual Practices of Material Management followed in Tractor Manufacturing companies.
- To objectively evaluate various factors for influencing the Material Management.
- Suggesting measures for removal of differences between the approach actually followed and approach suggested by educators regarding Material Management.

### Hypothesis for Study

In order to present the actual position of material management practices in tractor manufacturing companies in India, and to have their comparison with the suggested material management practices, the hypothesis study has been chosen so that the result can be evaluated more practically and with more accurate analysis results can be given.

- **Null Hypothesis (H<sub>0</sub>):** There is no significant difference between various factors of material management in tractor manufacturing companies and actual Material Management Practices.
- **Null Hypothesis (H<sub>0</sub>):** There is no significant difference between the material Management practices followed by different Tractor Manufacturing companies.

### Scope of the Study

For the study few tractor Manufacturing companies has been selected which includes Mahindra, Sonalika Tractors, HMT Limited. Various research Techniques and statistical Techniques has been considered such as ratio, percentages. Average analysis

### Research Methodology

Research methodology is a process, by which one can find the solution or solve the research problem. In other words, research methodology is the science of studying how research is done in a scientific manner. The trends have been analyzed by using the statistical techniques.

### Research Objective

The Research Objective is to find out why difference exit between the actual implemented methods of material management and theoretical and studied methods of Material Management, as well as to find out how Material Management can be implemented with its optimum level and utilization so that efficiency be can achieved and profitability can be increased.

### Sample Design

For the data collection and analysis, Random Sampling and Stratified Random Sampling Techniques have been used.

### Sample Size

A Sample of fifty to Hundred Material Management Professionals from all the selected Tractor Manufacturing companies has been taken for the purpose of data analysis.

### Data Collection

Secondary Data Collection – Secondary Data is collected from various Research and financial reports of various Tractor Companies, their Annual reports, journals, and various other research papers etc.

**Parameters** which were selected for “Reasons Difference” are as follows:

- Demand for the item of the material
- Production capacity of Plant
- Lead Time
- Storage capacity
- Available supply of Item
- Rejection rate of Input Material
- Techniques used for forecasting of need of material

### Results and Analysis

#### Comparative Analysis of Various Factors

In Comparative Analysis of various factors (as mentioned above) of Material Management which have significant effect on design and implementation of Material management policies are depicted through the below mentioned table. The results are taken based on an online survey through inquiry from various material management professionals of these three Tractor Manufacturing companies.

S. No.	Various Factors	Mahindra			Sonalika			HMT		
		1	2	3	1	2	3	1	2	3
(a)	Demand for the item of the material	57	24	19	43	28	29	52	29	19
(b)	Production capacity of Plant	9	23	68	14	27	59	23	24	53
(c)	Lead Time	43	19	38	51	21	28	49	27	24
(d)	Storage capacity	39	42	19	53	42	5	51	39	10
(e)	Available supply of Item	44	32	24	49	37	14	54	31	15
(f)	Rejection rate of Input Material	46	19	35	61	21	18	58	24	18
(g)	Techniques used for forecasting of need of material	21	33	46	27	27	46	19	37	44

**Here:** 1 Represents Agree, 2 Represents Neutral, 3 Represents Disagree

### Interpretation

The above table depicts the views of various Material Management Experts or professional of Different companies (Selected for Research) on effect of various factors affecting the Management of Material. As we can see in the table the impact of most of the items whether it is demand for the item of the material or lead time or storage capacity or available supply of item or rejection of input material or the techniques, each one has a significant impact on material management. Most of the expert has shown their agreement on the same. However one factor which is production capacity of the plant has found to have least impact on Material Management. Around Twenty Five to Thirty percent of the expert in all case remains neutral about the any of the factor. This indicates that in their opinion that particular factor on which they are neutral do not have any impact on Material Management.

- **Comparative Analysis of Various other Factors**

In Comparative Analysis of various other factors (which may be treated as External factors which are outside the control of entity) of Material Management which have significant effect on design and implementation of Material management policies are depicted through the below mentioned table. The results of the same are also taken based on an online survey through inquiry from various material management professionals of these three Tractor Manufacturing companies.

S. No.	Various Factors	Mahindra			Sonalika			HMT		
		1	2	3	1	2	3	1	2	3
(a)	Price volatility	38	16	44	51	29	20	49	21	30
(b)	Business Policies of Government	55	15	30	63	19	18	61	23	16
(c)	Economy of the country	37	23	40	38	29	33	49	31	20
(d)	Tax impact	46	23	31	51	21	28	49	18	33
(e)	Seasonal Factors	59	16	25	61	21	18	68	19	13
(f)	Technology	65	9	26	71	13	16	66	14	20

Here: 1 Represents Agree, 2 Represents Neutral, 3 Represents Disagree

### Interpretation

The above table depicts the views of various Material Management Experts or professional of Different companies (Selected for Research) on effect of other factors which may be treated as External factors which are outside the control of entity) affecting the Management of Material. As we can see in the table the impact of most of the items whether it is Price volatility or Business Policies of Government or Economy of the country or Tax impact or Seasonal Factors or Technology each one has a significant impact on material management. Most of the expert has shown their agreement on the same. Around fifteen to twenty percent of the expert in all case remains neutral about the any of the factor. This indicates that in their opinion that particular factor on which they are neutral do not have any impact on Material Management.

### Conclusion and Recommendations

After going through with all above discussion and analysis one thing is clear that Material Management policies of Different tractor companies do not have similarities and based on above it can be conclude that

- There exist difference between various factors of material management in tractor manufacturing companies and actual Material Management Practices.
- There also exists significant difference between the material Management practices followed by different Tractor Manufacturing companies.

Hence the null hypothesis is rejected. Indian Tractor Manufacturing companies still are not using the Material Management policies at its optimum level and hence are not in position to take the benefit of reduced cost of material. There is lot of more which can be done by the Indian Tractor manufacturing companies to achieve that level where they can reduce the cost of operation to the great extent. They has to adopt an integrated approach. Many of the companies has, no doubt adopted centralized Management structure and started delegating the authority to their employees, but still in india family business concept exist which stops companies to delegate the power and it becomes an obstacle in the success of the company.

Neither the excess inventory nor the lack of inventory can benefit the entity. Excess inventory given additional cost of carrying the inventory and non availability of inventory on time gives a halt to production process which result loss of Lakhs of rupees. Proper management of inventory removes the both. The researcher concludes on the above basis that actual policies followed by Material

management professional are different from what suggested but yet practical and required. However with the use of those suggested policies the results can be made better. Researcher strongly recommends development of a separate department in an organization as sub department of the production department whose work is not just only to make inspection but to develop the policies for material management comparing the policies followed by other firms in the same business, nationally as well as inter nationally and implementing the same with the object of securing a proper management of material and reduction in the cost.

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