

## A COMPARATIVE STUDY OF THE INVENTORY MANAGEMENT TOOLS OF TEXTILE MANUFACTURING FIRMS

*Vasundhara Dahiwale<sup>1</sup> & Pallawi B. Sangode<sup>2</sup>*

<sup>1</sup>*Research Scholar, Department of Operations Management, Dr. Ambedkar Institute of Management Studies and Research,  
Nagpur, Maharashtra, India*

<sup>2</sup>*Assistant Professor, Department of Operations Management, Dr. Ambedkar Institute of Management Studies and  
Research, Nagpur, Maharashtra, India*

**Received: 27 Mar 2019**

**Accepted: 04 Apr 2019**

**Published: 26 Apr 2019**

### **ABSTRACT**

*The prime objective of inventory management is to ensure enough stock on hand for the business to meet the customer's requirements. Various inventory management tools ensure the various types of inventories are properly segregated, managed and utilized. These tools help in reducing the costs, wastages and delays in the production process. This research paper aims at studying the inventory management tool used by the textile manufacturing firms, followed by comparing the inventory management practices of two textile manufacturing firms. The use of inventory tools as a competitive intelligence tool provides the opportunity to reveal the benefit gaps between the two companies. The paper concludes with a indicative model with several recommendations for other firms with similar business performances.*

**KEYWORDS:** *Inventory Management Tools, Economic Order Quantity*

### **INTRODUCTION**

Inventory management is about managing the stock of material for production. It deals with inventorying the right amount of material in the form of raw material, semi-finished goods, finished goods, maintenance and repair inventory and supplies inventory like the plant and offices cleaning material. Proper management of inventory helps the organisation to attain independency in production process. The succeeding requirement for holding inventory is to meet variation in demand. As the requirement in the market change, the organisation must be proactive in adapting the production change and meet the demand thereby allowing production flexibility. In cases of contingency, like raw material non-availability in the market or market price hike for the material or variations in the raw material deliveries, inventories provide a safeguard to the production process. Other reasons for the inventories are maintained by the organisation are to take advantage of economic purchase order size, bulk discounts and reduction in transportation and ordering costs.

Production of single product require various types of raw material. These types of material can be differentiated based on the price, quantity/ usage in the product, frequency of requirement in the production, availability, importance etc. hence inventory management becomes a crucial activity in the organisation. Storing, inspecting and processing of the material may differ from material to material and hence various inventory management tools are developed and used by the organisation to judiciously use these importance resources. Following are certain inventory management tools used by the

organisation:

- ABC analysis is a type of inventory control techniques that is based on annual consumption value. It is used to control inventory of raw material and W. I. P. inventory.
- VED analysis, which is Vital-Essential-Desirable analysis, is based on the criticality of items and is used to determine the stocking level of spare parts for the machines and equipment.
- FSN analysis, which is Fast-moving- Slow moving-Non-moving analysis, is based on the consumption pattern of the items and is used to control obsolescence of the material.
- HML analysis, which is High-Medium-Low analysis, is based on the unit price of the item and is used to control purchases and develop vendors.
- SDE analysis, which is Scarce-Difficult-Easy analysis, is based on purchasing problems in regard to availability and is used for lead time analysis and purchasing strategies.
- GOLF analysis, which is Government-Open market-Local-Foreign market analysis, is based on the source of material and is used for developing the procurement strategies from these sources.

## LITERATURE REVIEW

Literature review was done to identify and study the inventory management practices prevalent in the textile industry in India and outside.

The research (Abuthakeer, Pavithran, Vigneshraj, & Vimalkumar, 2017) aimed at studying the inventory management in a textile industry manufacturing fabric from yarn. The study concluded that in the order cope with the rapidly emerging textile industries in India, it is for the company to adopt modern technology. Apart from enhancing its technical capabilities the industry must also focus on improving its resource utilisation, for economic and sustainability.

The study (Shen, Deng, Lao, & Wu, 2017) aimed at identifying the key factors that influence the inventory management practices by the manufacturing firms. The recommendations made through the study were

- Hire more supply chain professionals
- Establish strategic suppliers [partnership
- Improve the IT infrastructure e
- Improve company regulations and standardize operational processes

The study on 'Management Of Inventories In Textile Industry: A Cross Country Research Review' (Shafi, 2014) aimed at studying how inventories in textile sector are managed across the globe. The literature study showed that textile sector is a growing field all-over. And the textile firms are working on solving the problems on efficient inventory levels. The study suggests that various aspects of inventory management are yet to be explored. And since the textile sector has gained importance in the recent past, future work needs to be done in the area of inventory management.

The study (ARO-GORDON & GUPTA, 2016) aimed at investigating the contemporary techniques for inventory management. The results suggested that a proper inventory control system is closely associated with low storage costs, cost-reduction and timely delivery of requisite goods, products, materials and services to customers and stakeholders, thereby enhancing sustained profitability, competitive ability, and enhanced market diversification prospects. Authors further suggested that numerical examples of real-world application of inventory management techniques among public and private enterprises must be studied. Few modern inventory management techniques identified were Setting up and monitoring various stock levels, Automated inventory system, Establishing proper purchase procedures, Inventory Turnover Ratio, ABC inventory classification technique, Just-In-Time inventory management technique, Bulk-purchase approach, Vendor-Managed Inventory (VMI), Out-sourcing inventory control personnel, Lead-time analysis, and Software applications and tracking system.

In textile industry (Raparia, 2017), inventory management based on the upstream and downstream activities ie to maintain large amount of inventories and expend minimum costs in the inventory for profitability. The challenges that the textile industry face with respect to the inventory management are Fluctuating customer preferences, Unrealistic shipping and return policies, Lack of digitization, Wide variety of products.

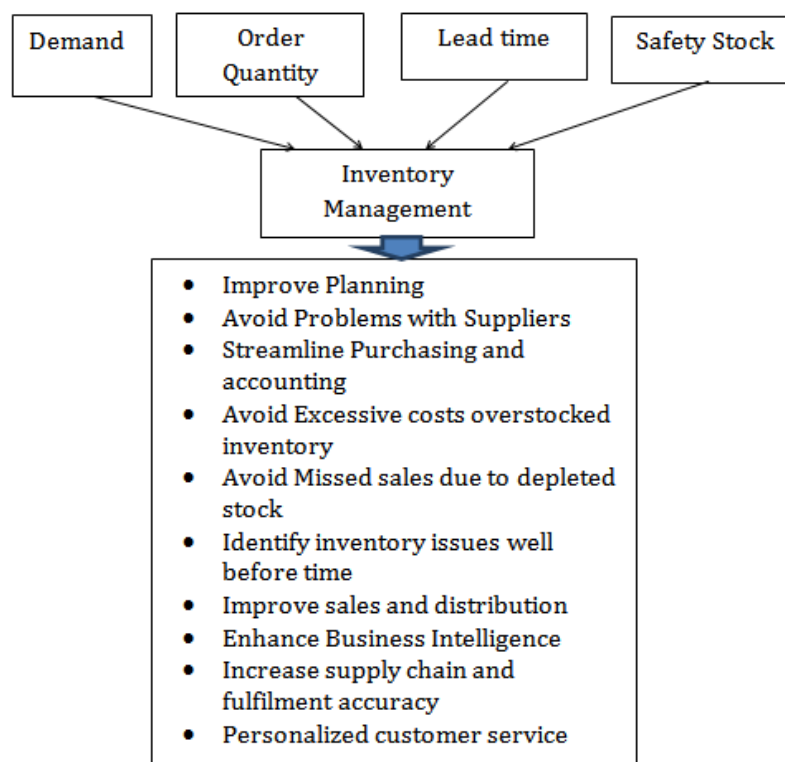


Figure 1: Inventory Management (Raparia, 2017)

## RESEARCH METHODOLOGY

### Objectives

The general objective of this research is to examine the inventory management tools used in the manufacturing industries and study the impact of inventory management tools on the operations performance of the firm. Thus, this study specifically attempted to address the following objectives:

- To identify the tools used by manufacturing industry in managing their inventory management.
- To compare the inventory management practices bases on the tools used by two textile manufacturing firms

### Research Design Including Sample Design

The study adopted an empirical cross sectional design. Both qualitative and quantitative were deployed to address the research objectives. The qualitative research was conducted to understand the problem in inventory management by conducting a structured interview. The quantitative research design includes survey research and comparative research. This data would help to address the research to the textile industries.

This study is conducted on two textile manufacturing firms.

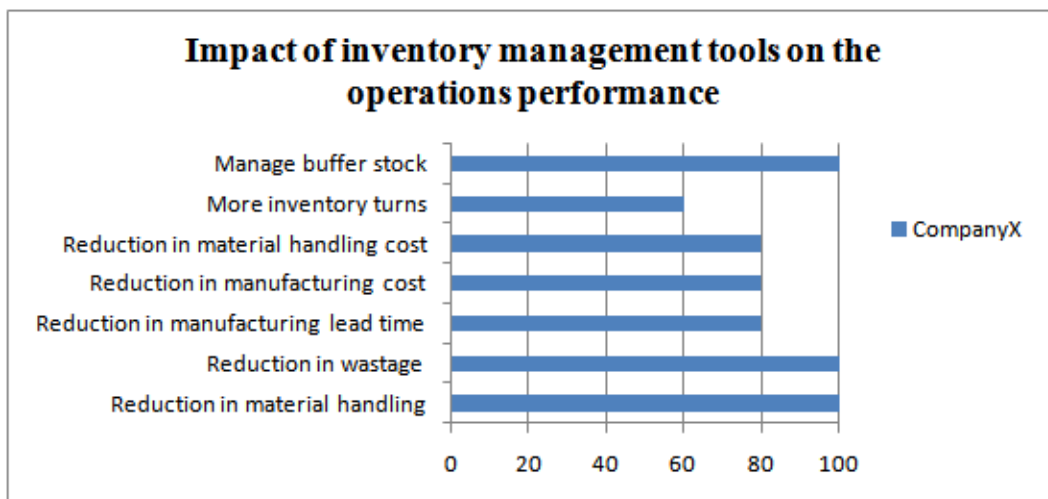
### Data Collection

This study utilized primary data. Data was obtained using questionnaires developed by the researcher. The questionnaire contains questions and statements based on the research objectives. The questions were structured in such a way that they are easy to administer and analyze as well as aided the researcher obtain in depth responses on the survey.

Questionnaire is divided into four sections: Section A deals with general information of respondents and the organization; Section B addresses the implemented inventory tools and techniques; Section C deals with the impact of inventory tools and techniques on firm performance and Section D deals with the advance technology resources used by the firm. The target respondents were operations, procurement and inventory or store managers or any other person who may have the equivalent position. This was followed by interviewing the respondent from the firm.

### DATA ANALYSIS/PRESENT WORK FOR COMPANY X

#### Rating on the Impact of Inventory Management Tools/Techniques on Operations Performance of Company X



**Figure 2: Impact of Inventory Management Tools/Techniques on Operations Performance of Company X**

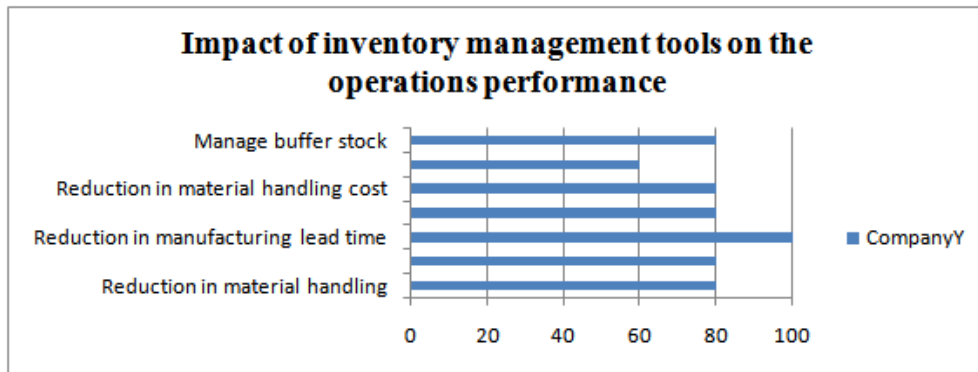
Above chart show the percentage impact of inventory management tools on the operations performance of the organisation X. It can be seen that there is 100% impact on managing buffer stock, reduction in wastage and reduction in material handling by implementing the inventory tools and techniques on the operations performance.

On the other side, there is 80% impact on the operations performance of reduction in material handling cost, manufacturing cost and manufacturing lead time by implementing the inventory tools and techniques.

Hence, according to the obtained information the average impact of inventory management tools and techniques on operations performance of company X is 86%.

**COMPANY Y**

**Rating on the Impact of Inventory Management Tools/Techniques on Operations Performance of Company Y**



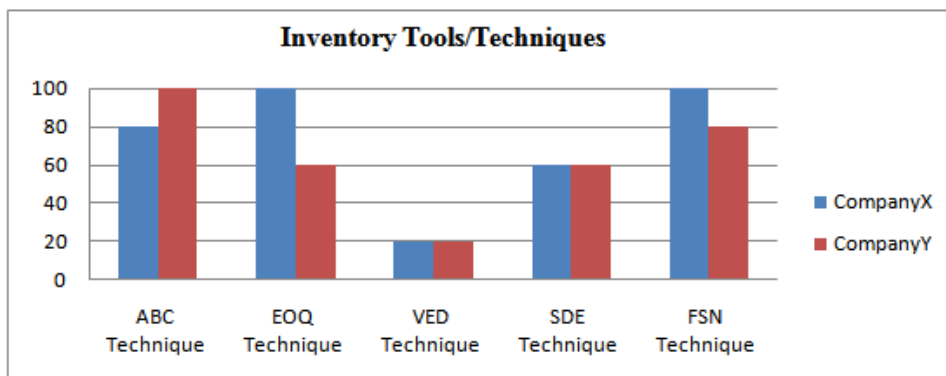
**Figure 3: Impact of Inventory Management Tools/Techniques on Operations Performance**

Above chart show the percentage impact of inventory management tools on the operations performance of the organisation Y. From the above obtained rating and its graphical representation of company Y, there is 100% impact on reduction in manufacturing lead time by implementing the inventory tools and techniques. On the other side, there is 80% impact on managing buffer stock, reduction in material handling cost, reduction manufacturing cost and reduction in wastage and reduction in material handling by implementing the inventory tools and technique.Hence, the average impact of inventory management tools and techniques on operations performance of company Y is 80%.

**COMPARATIVE ANALYSIS OF INVENTORY MANAGEMENT TOOLS BETWEENCOMPANY X AND COMPANY Y**

**Rating on Inventory Management Tools Are Being Used By X and Y Organisation**

**Raw Material**



**Figure 4: Inventory Tools/Techniques Used In Raw Material Inventory by Company X and Y**

From the above obtained comparative study of company X and company Y, ABC technique is implemented by company X is less than company Y i.e. 80% and 100% respectively.

EOQ technique is highly used by company X as compared to company Y i.e.100% and 60% respectively.

VED technique is used by company X and company Y is least used i.e. 20%. SDE technique is used by company X and company Y is 60% respectively.

FSN technique is used by company X is more than company Y i.e. 100% and 80% respectively. Therefore, the overall average implementation of inventory tools and techniques by Company X is 3.6 and Company Y is 3.2.

### Work In Process (WIP) Material

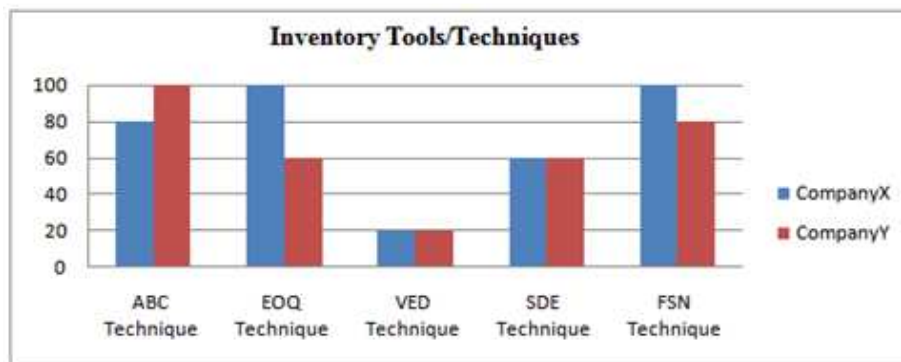


Figure 5: Inventory Tools/Techniques Used For WIP by Company X and Y

From the above obtained rating and its graphical representation of company X, it implements least amount of overall inventory tools and techniques like ABC technique, VED technique, SDE Technique, EOQ and FSN technique to manage the WIP inventory i.e. only 20%.

Other than that Company Y implements ABC technique about 100% amongst all. And about 80% FSN technique is implemented to manage the WIP stock. Again the EOQ and SDE technique both are implemented to 60%.

Company Y implements VED technique wisely i.e. 20%. Hence, overall average inventory tools and technique are being used by company X is 1 and Company Y is 3.2.

### Finish Goods

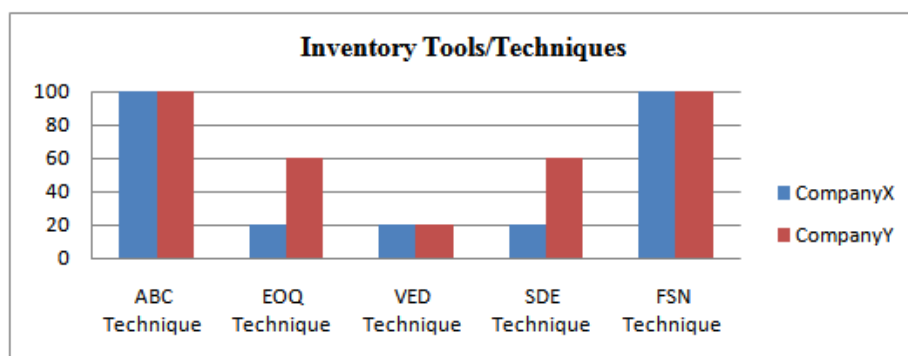


Figure 6: Inventory Tools/Techniques Used For Finish Goods by Company X and Y

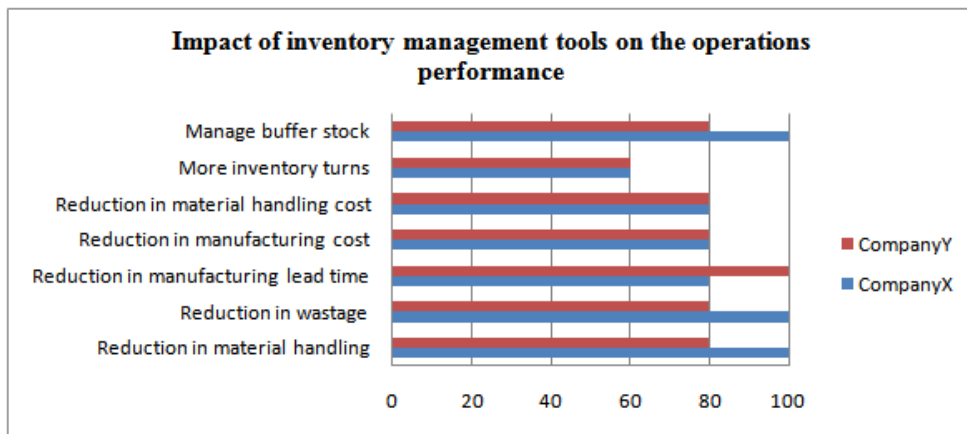
From the above obtained rating and its graphical representation of company X and Company Y, both implements ABC technique and FSN technique fully i.e. 100%.

Similarly, EOQ technique and SDE technique are implemented by Company X is 60% and by Company Y is 20% to keep the stock of finish goods in warehouse respectively.

Company X and Company Y, both implements the inventory tools and techniques to manage the inventory of finish goods is only 20%.

Hence, overall average implantation of inventory tools and technique by company X is 2.6 and Company Y is 3.4.

**Rating the Impact of Inventory Management Tools/Techniques on Operations Performance of Company X and Y**



**Figure 7: Impact of Inventory Management Tools/Techniques On Operations Performance Of Company X And Y**

From the above obtained rating and its graphical representation of company X, the average impact of inventory management tools and techniques on operations performance of company X is 4.3.

From the above obtained rating and its graphical representation of Company Y, there is 100% impact of reduction in manufacturing lead time and for Company X there is 100% impact on managing buffer stock, reduction in wastage and reduction in material handling by implementing the inventory tools and techniques on the operations performance.

Company Y has 80% impact of managing buffer stock, reduction in material handling cost, reduction manufacturing cost, reduction in wastage and reduction in material handling and for Company X, 80% impact on reduction in material handling cost, reduction in manufacturing cost and reduction in manufacturing lead time by implementing the inventory tools and techniques on the operations performance.

On the other side, both the Company X and Company Y there is 20% impact on managing inventory turns by implementing the inventory tools and techniques on the operations performance.

Hence, the average impact of inventory management tools and techniques on operations performance of company X is 86% and Company Y is 80%.



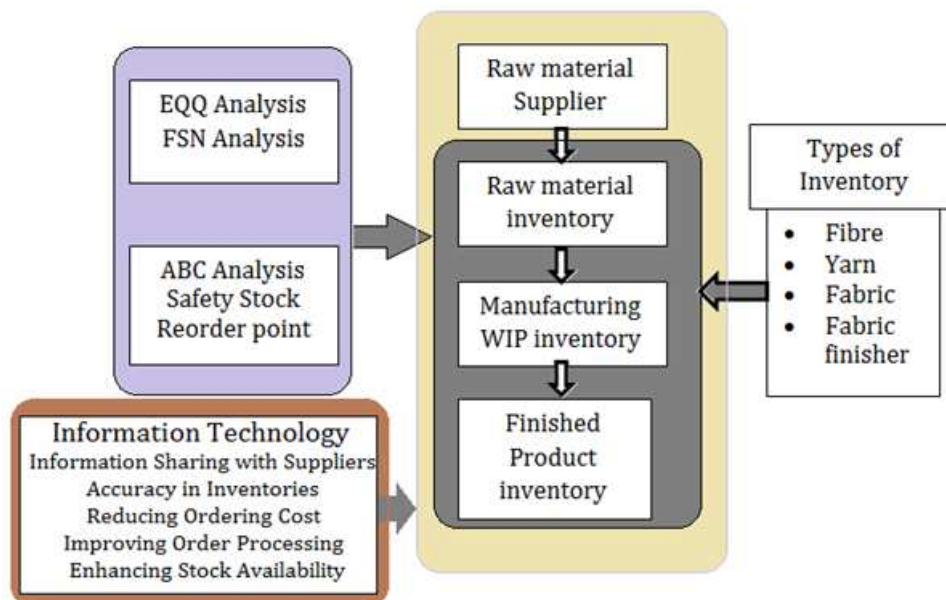
## CONCLUSIONS

While going through the available literature it was found that almost each country that has a growing textile sector is trying to tackle with the problem of deciding the efficient inventory level. Many researchers have shown interest in the field of inventory management and have come up with beautiful work. As the field of inventory management is not very old, so many aspects are yet believed to be explored. Not much amount of work has been done on this area of managing inventories in Textile sector. So it leaves an ample scope for this study.

The conclusions of the study are based on the objectives. The study sought to establish the role of inventory management approaches on the operations performance of textile firms. Specifically, the study sought to establish the inventory management tools and techniques used by textile firms; to establish the level of effectiveness of inventory management approaches of textile firms and to determine the impact of inventory management tools and techniques on operations performance of textile firms in Nagpur region. On the other hand, they use ERP software and MIS software which helps to maintain the level of raw material according to their lead time assigning to.

Regarding the first objective, the study found out that companies used inventory management tools and information technology to improve the effectiveness of the operations performance. The data collection approach gives the light on their traditional methods of managing. They also adopted the technological advancement in their traditional work culture which gives them more flexibility to work with the software like MIS software, ERP software etc.

Regarding the second objective, the study found that the impact of some inventory tools and techniques used by the companies are somewhat effective and some are the least effective. Those inventory tools and techniques are not giving effective result, should implement in lower extent while other which gives more effectiveness and flexibility, should implement in greater extent.



**Figure 8: Inventory Management Model for Textile Manufacturing Firms**

Finally a model has been developed that comprises of the inventory management tools that are prominent in the textile manufacturing firms, as inputs to the various levels of inventory. Further the role of information technology is also



highlighted in the model. This input has been derived from several literature reviews. Information technology in inventory management would aid in prompt and fast information sharing with its supplier, provide accuracy in inventories, reduce ordering costs, and thereby enhance stock availability.

EOQ analysis and FSN analysis can be used for ordering optimum quantity of raw material for inventory and FSN analysis can be used for reducing the obsolescence in the stock. A proper balance between the safety stock and reorder point may ensure optimum inventory. Further ABC classification would aid in the classification of material based on its value and usage.

## REFERENCES

1. Abuthakeer, S., Pavithran, T., Vigneshraj, M., & Vimalkumar, S. (2017). *Aggregate Planning And Inventory Management In Textile Industry*. *Ijrer International Journal Of Recent Engineering Research And Development*, 56-67.
2. Aro-Gordon, S., & Gupte, J. (2016). *Contemporary Inventory Management Techniques: A Conceptual Investigation*. *International Conference On Operations Management And Research*.
3. Ioannis Sotirios Ganas, A. H. (May 2015). *Inventory Management And Its Impact On Firms' Performance: An Empirical*.
4. Raparia, P. (2017). *Supply Chain Management In Textile Sector: A Sequential Process*. *Iosr Journal Of Business And Management (Iosr-Jbm)*, 43-50.
5. Shafi, D. M. (2014). *Management Of Inventories In Textile Industry: A Cross*. *Singaporean Journal Of Business Economics, And Management Studies Vol.2, No.7, 2014*.
6. Anyibuofu, M. K. (2014). *Inventory Management Practices In Manufacturing Firms*.
7. Blogspot. (2017, May 04). Retrieved From [Www.Textilestudy365.Blogspot.Com:Http://Textilestudy365.Blogspot.Com/2017/05/Just-In-Time-Jit-Of-Lean.Html?M=1](http://www.Textilestudy365.Blogspot.Com:Http://Textilestudy365.Blogspot.Com/2017/05/Just-In-Time-Jit-Of-Lean.Html?M=1)
8. *Inventory Management : Concept, Practices, Techniques*,. (N.D.).
9. Khan, M. (N.D.). Retrieved From [Textilelearner.Blogspot.Com:Http://Textilelearner.Blogspot.Com/2012/09/Process-Management-In-Textiles-Textile.Html](http://Textilelearner.Blogspot.Com:Http://Textilelearner.Blogspot.Com/2012/09/Process-Management-In-Textiles-Textile.Html)
10. Md. Syduzzaman, M. A. (2016). *Developing A Framework For Implementing Total Quality Management In The Apparel Industry: Case Study On A Bangladeshi Apparel Manufacturing Factory*. *International Journal Of Textile Science* 2016.
11. Nurul Nadia Suraidi, S. J. (January 2016). *A Study On Relationship Between Inventory Management And Company Performance: A Case Study Of Textile Chain Store*.
12. Ontita, D. S. (2013). *Inventory Management Approaches And Performance Of Textile Manufacturing Firms In Kenya*.

13. Shen, H., Deng, Q., Lao, R., & Wu, S. (2017). *A Case Study Of Inventory Management In A Manufacturing Company In China*. *Nang Yan Business Journal*.
14. Ahmed, A. (2018). *What Are Inventory Systems*. <https://Bizfluent.Com/Info-7954427-Inventory-Systems.Html>.