



A Study of Inventory Management System of Linamar India Pvt. Ltd, Pune

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Abstract

The aim of the study is to examine the inventory management process. The significance of this research is based on the benefits that can be obtained by identifying the issues of inventory control. The methodology used are unstructured interviews, on-site study, and annual report analysis. Inventory management is an important area of manufacturing industry. If company fails to manage inventory, they will face failure. It is a challenge for the company to maintain fair inventory. There are various inventory management techniques available for maintaining fair inventory level in the company. The basic objective of this paper is to study about inventory management techniques used in Linamar India Pvt. Ltd. and find out some measures for improvement on inventory management process of the concerned company. The present system of inventory management of the company is good. For improvement of the present inventory management system, company should adopt other inventory management techniques.

Keywords- Inventory, Challenges, Management & Techniques

JEL Classification: D890, G31

Paper Classification: Research Paper

Introduction

Inventory is components forming the part of the manufacturing process. Inventory is basically classified into 3 types, these are: Raw Material, Work in Progress and Finished Goods.



Raw Material: This is the basic material which goes into the process of manufacturing. It forms the base of finished goods.

Work in Progress: These are semi-finished goods.

Finished Goods: This is the final output of the manufacturing process.

The manufacturing process starts with the raw materials, then it is taken into processing and turned into finished goods. Most of the times in between manufacturing or the production process a new by-product is formed, which acts as a raw material for some other product.

The inventory needs to be managed efficiently due to various reasons, some of them can be:

- For smooth running of business
- To fulfil an expected demand
- To avoid a stock-out situation
- To seek protection from price increases in near future
- For the smooth distribution cycle

An efficient inventory management system helps in integrated functioning of all these above-mentioned factors. It is a process dependent on effective inventory control. There are various inventory control techniques like: EOQ, ABC analysis, VED analysis, Safety stock level etc.

In this research paper, the inventories of an automotive parts manufacturing company are considered.

Linamar India Pvt. Ltd, Pune

Linamar India is a Private limited Company incorporated on 26th August 2013. It is a Subsidiary of Foreign Company, Linamar Corporation and is registered at the Registrar of Companies; Pune. Linamar Corporation operates in many other countries like France, Germany, China, Canada, Hungary and U.S.A. The parent company of Linamar India is listed in Canada Stock Exchange. The company works with the tag line, "POWER TO PERFORM" and "ONE TEAM, ONE LINAMAR"

Linamar India's official share capital is Rs. 55, 00, 00,000 and its paid up capital is Rs.22, 90, 00,000. It is involved in manufacturing special purpose machinery. The company completed its 5th year on 26th August 2018. It works on 3 core concepts: Customer, Employee, and Financial. Linamar India Private Limited's Annual General Meeting (AGM) was last held on 30th September 2017 and as per records from Ministry of Corporate Affairs (MCA), its balance sheet was last filed on 31 March 2017.

The company produces core engine components including cylinder blocks & heads, camshafts and connecting rods. From the core precision, metallic components used in automotive power trains to sky jack aerial work platforms, to the agricultural products that Harvester and OROS designs and builds. The company has a diversified product line and the company manufactures products that power vehicles, motion, work and lives. For transmission, company builds different assemblies, gear sets, shaft & shell assemblies, as well as clutch models. For the vehicle's driveline, the company is a full-service supplier of gears and gear driven systems such as Power Transfer Unit and Rear Drive Unit for use in all-wheel drive systems. From single machine components to complex assemblies, company is the supplier of choice for OEM (Original Equipment Manufacturer) customers.

The products manufactured by Linamar are of different kinds, Transmission Housing, Output shaft, Clutch Housing, Spline shaft, Selector Shaft, Cylinder Head and Bar Pin.

Review of Literature

Hong Shen, Qiang. Deng, Rebbaca Lao, Simon Wu (2016) focused on boosting the inventory management to improve the supply chain of the company. Drop in inventory is considered one of the most significant aspects of inventory management. In practice, small inventory level is not always a better solution, so manufacturers need to maintain the correct amount of inventory at the correct level. As mentioned by Sunitha, K. V. (2012) in her thesis, inventory management is vital for keeping costs down, when meeting regulations. It is difficult to balance demand and supply and inventory management to make sure that the balance is untouched. The trained inventory management and good quality software will help make inventory management a victory. The ROI of Inventory management has seen better revenue and profits, positive employee ambiance and increase in customer satisfaction. Plinere, D. & Borisov, A. (2015), concluded that, inventory management is necessary to every company, having inventories. Companies have stock, but so much as to keep away from overstock and out-of-stock situations. Inventory management can better company's inventory control existing condition and reduce costs of the company. Jose, T., Jayakumar, A., & Sijo, M. T. (2013) found the difference between EOQ & number of pieces purchased. It is observed that the company is not using EOQ for buying the materials. Therefore, inventory management is not reasonable. From estimate of safety stock, company can decide how much inventory the company can keep in back stock per annum. Mohamad, S. J. A. N. bin S., Suraidi, N. N., Rahman, N. A. A., & Suhaimi, R. D. S. R. (2016) concluded that efficiency of inventory management is a major concern area of business. Suggestions are given to improve the performance of inventory management, demand forecasting, scattered inventory & cycle counting. Atnafu, D. & Balda, A. (2018) focuses on inventory management & explains the relationship between inventory management practices, competitive advantage & organizational performance. The finding of the study on basis of data analysis is that there is a positive relationship between competitive advantages and inventory management performance. And better organizational performance gives a firm bigger capital to apply various inventory management techniques

Research Methodology

The study is based on primary data collected by finance executive of the Company and secondary data which are collected from the books, journals articles annual reports of the company & websites. The techniques used in the study are ABC Analysis, EOQ, Inventory turnover ratios & Safety Stock.

Data Analysis & Interpretations

EOQ is the inventory management tool for determining optimum order quantity which is the one that reduces the total of its carrying costs and order.

Table 1: Calculation of EOQ for the year 2017-2018

Serial No	Particulars	Demand (Per Year)	Re-Order Cost/order	Carrying Cost/ unit/year	EOQ	No. of orders last year
1	LD Differential case	86160	5000	50	4151.14	21
2	HD Differential case	24552	4000	40	2215.94	11
3	LD Output Shaft	136992	2000	10	7402.48	19
4	HD Output Shaft	11160	1800	8	2340.89	6
5	Spline Shaft	57600	100	2	2400	24

6	Selector Shaft	48000	100	2	2190.89	22
7	Cylinder Head	18000	12000	500	929.516	19
8	Transmission Housing	480	2000	50	195.95	3
9	Clutch Housing (1)	72	1000	60	48.98	2
10	Clutch Housing (2)	180	800	30	97.97	2

Source-Company annual reports

Table 1 shows that, the number of units of each component purchased in the organization is compared with the calculated Economic Order Quantity. It is found that, there is a difference in the no. of units purchased & Economic Order Quantity. It is known that the company is following Economic Order Quantity technique for purchasing the material and therefore the inventory management is satisfactory, still the company can improve its inventory system.

Safety stock is the reduced surplus inventory, which serves as a safety margin to meet an unexpected increase in usage resulting from a strangely high demand and an unmanageable late receipt of incoming inventory.

Table 2: Safety stock calculation for the year 2017-2018

Serial No	Components	Max. Lead Time	Avg. Lead Time	Average Consumers	Max. Consumers	Demand
1	LD Differential case	90	60	200	250	86160
2	HD Differential case	90	60	70	80	24552
3	LD Output Shaft	90	60	400	500	136992
4	HD Output Shaft	90	60	50	70	11160
5	Selector Shaft	90	60	160	200	57600
6	Spline Shaft	90	60	135	150	48000
7	Cylinder Head	90	60	5	10	18000
8	Transmission Housing	90	60	2	5	480
9	Clutch Housing (1)	90	60	1	3	72
10	Clutch Housing (2)	90	60	2	5	180

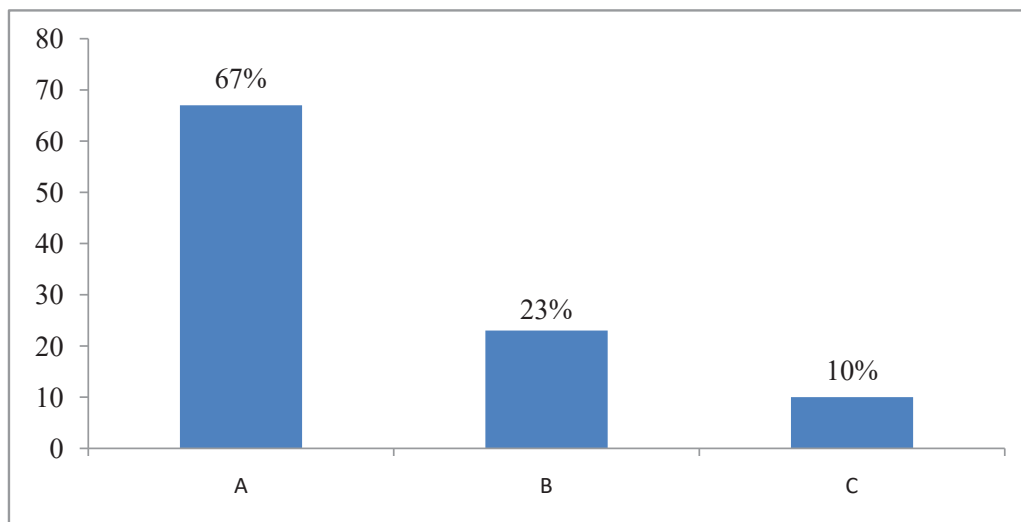
Source - Company annual reports

Table 2 shows the calculation of safety stock. Safety stock is calculated for every product. The actual demand is given for the period of one year for each product. Maximum Lead time is taken at 90 days and normal lead time is taken 60 days. By determining the level of safety stock, the organization gets to know how much stock it should maintain at any given point of time in the year. Safety stocks will the help the organization to meet any emergency. From Table 2, it is clear that the organization is maintaining enough safety stock.

Table 3: Classification of A, B and C items in the Organization for the year 2017-2018

Item Number	Average no of units	Cost per Unit	Total Cost	Percentage in total cost
1	50000	60.80	3040000	30%
2	15000	102.40	1536000	15%
3	120000	11	1320000	13%
4	10000	100.28	1002800	10%
5	55000	3.40	187000	2%
6	40000	56	2240000	22%
7	14000	48	672000	6.61%
8	400	300.20	120080	1.18%
9	50	360	18000	0.18%
10	150	176.30	26445	.026%
Total			Rs. 10162325	100%

Source- Company annual reports

**Fig 1.: Classification of A, B and C items in the Organization for the year 2017-2018**

Source-Secondary Data

Fig 1 shows that 67 % (70% standard) of the items are from A category in the organization, 23 % (20% standard) of items are from B category in the organization, and 10% (10% standard) of items are from C category. It is clear that the organization follows ABC analysis properly, but still they can improve their inventory management.

Inventory Turnover Ratio

Inventory turnover ratio is also called Stock Turnover Ratio. It is the calculated inventory frequency that is converted into the sales. In simple terms, it measures capacity of the firm to generate revenue.

It is calculated by dividing net sales by average inventory,

Inventory Turnover Ratio = $\frac{\text{Net Sales}}{\text{Avg. Inventory}}$

Avg. Inventory

Table 4: Inventory Turnover Ratio of Linamar India Private limited for Past Three Years

Year	Net Sales (Rs.)	Avg. Inventory (Rs.)	Ratio
2015-2016	8,44,88,723	6,62,28,318	1.27:1
2016-2017	11,06,43,669	8,92,28,407	1.80: 1
2017-2018	18,20,97,639	5,56,27,391	3.27:1

Source-Secondary Data

Table 4 shows the increase in trend of stock turnover ratio. The ratio in first year was 1.27 to its sales which rose to 1.80 in the second year and 3.27 in the third year. Increasing trend in inventory turnover ratio denotes positive sign for the organization because the sales are also increasing. An increasing trend shows that the company is maintaining its inventory well.

Findings

- It is found that the organization is following EOQ technique. The company is working as per the defined EOQ level. Overall the working of EOQ is reasonable.
- From the safety stock calculation, it can be determined how much inventory the company can keep in its reserve stock per annum. Through this analysis it is known that the organization is having enough stock at all times.
- Through ABC analysis one comes to know about important items in the organization. The company is following ABC technique of inventory management very efficiently. There are 67% items in the A category. B category has 23% items and C category has 10% items.
- The inventory turnover ratio of the organization is satisfactory. It is according to its standard ratio. The ratio in first year was 1.27 which rose to 1.80 in the second year and 3.27 in the third year. Increasing trend in inventory turnover ratio denotes positive sign for the organization because its sales are also increasing.
- In material analysis, various types of materials like raw material, WIP and closing stock are studied. Through this analysis one got to know about the company's inventory value for past three years. The inventory of the company has increased in every year.
- The overall performance of the organization is satisfactory because of its prominent increase in sales. The sales have increased every year.

Suggestions

Existing inventory management system of the organization is good but if inventory management system is to be improved they should adopt some new inventory management system. The organization should also try to adapt more inventory management techniques like Just In Time (JIT) inventory system. This technique will save the time of the organization and will also reduce the inventory holding cost in the organization. As the organization is already following Lean manufacturing, now the organization can also try and implement different manufacturing techniques like TQM, Six Sigma etc.

Conclusion

The Inventory management is significant for any manufacturing organization. It helps the organization in smooth running of its activities and in reducing the cost of managing the inventory. From the above data study, it can be concluded that Linamar India Private Limited is managing its inventory very efficiently. The techniques undertaken by the organization are helping it in continuous flow of its production activities. EOQ, safety stock analysis, ABC analysis are being undertaken efficiently and effectively. Inventory turnover ratio is also showing an increasing trend which indicates that sales of the organization is increasing every year.

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