

An Evaluation of the Stock Handling System: A Case Analysis of Mumbai Based Production Firm

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Abstract: The purpose of this research is to look into the method used to manage inventories. The research conducted is significant because it highlights the benefits of identifying stock control issues. The methods employed include on the spot investigation, informal conversations, and periodic review assessment. In the manufacturing sector, inventory management is crucial. Company will fail if inventory management is poor. The corporation finds it difficult to keep fair inventories. Using a range of methods to handle inventories, the corporation can keep its inventory level within reasonable bounds. The primary objective of the article is to examine the methods of inventory handling used by XYZ Corporation and to pinpoint potential enhancements that might be implemented into the business's inventory control system. The organization currently uses an efficient system for managing its inventories. The organization needs to use several inventory management strategies to enhance the current system.

I. INTRODUCTION

Inventory is made up of parts that are used in the manufacturing process. In general, inventory is divided into three categories: raw supplies, ongoing work, and finished products.



Raw Supplies: This is the fundamental component of the manufacturing process. It serves as the foundation for final products.

Ongoing Work: These products are in the intermediate stages of completion.

Finished Products: This is the product that was ultimately produced.

The raw materials are the first step in the manufacturing process, after which they are processed and transformed into final commodities. The majority of the time, a new by-product is created in the middle of the manufacturing or

production process and serves as the raw material for another product.

Several factors, including but not limited to the following, necessitate effective inventory management:

- For efficient company operations
- To satisfy a predicted need
- To avert an inventory-out situation
- Should seek insulation from higher costs in the coming years
- Regarding the uniform dispersal pattern

All of these previously mentioned factors perform more effectively when there is an effective inventory management system in place. It is a procedure that is dependent on efficient inventory management. There are numerous methods for controlling inventory, including the EOQ, ABC analysis, VED assessment, backup stock level, etc. An automotive component manufacturer's inventories are taken into account in this study report.

II. XYZ COMPANY, MUMBAI

XYZ was established on April 28, 2013, as a private limited company. It is registered at Mumbai's Registrar of Companies and is an affiliate of a foreign company. The XYZ Company also conducts business in a number of other nations, including Canada, Hungary, France, Germany, and China. The XYZ firm's parent firm is a member of the Canadian Stock Exchange. The accumulated funds are Rs. 25, 95,000,000, while the authorized capitalization of XYZ Limited is Rs. 58, 00, 00,000. That produces machinery for specialized use. The business reached its fifth anniversary on April 28, 2018. Consumer, workers, and financial considerations form the basis of its operation. The most recent annual meeting (AGM) of XYZ Company took place on October 25, 2017.

The company manufactures connecting rods, cylinder blocks and heads, and camshafts, among other essential engine parts. Beginning with the crucial, highly precise metallic components employed in car engines to aerial crane job sites to the crop products that extract and OPES create and build. The firm produces goods that propel mobility, work, and daily life, and it offers a diverse product portfolio. The company manufactures several clutch models, shaft & shell assemblages, gear sets, and assemblies for transmissions. The company provides a wide selection of cogs and cogging installations for the vehicle's driveline, notably Energy Transmission Modules and Back Motion Modules for installation in all-terrain driving arrangements. Company is the go-to provider for OEM (Original Equipment Manufacturer) clients for anything from simple machine parts to intricate assemblies. Different types of products, including gearbox housing, outlet shaft, gear dwellings, connector shaft, selection shaft, engine head and bar pin are produced by XYZ Company.

III. LITERATURE SURVEY

In order to improve the organization's supplier network, Simon Wu, Rebbaca Lao, Hong Shen, and Qiang Deng (2016) focused on improving the handling of stocks. The decline in stock is among the foremost crucial aspects of managing stock. In reality, maintaining a small amount of storage may not be the greatest course of steps therefore manufacturers need to maintain the proper amount of storage to reach the appropriate amount. Inventory control is crucial for minimizing costs while still adhering to laws, as Sunitha, K. V. (2012) noted in her thesis. To maintain the equilibrium, it is challenging to balance supply and demand as well as inventory management. Inventory management will succeed with the support of skilled staff and high-quality software. The profit made on investments from handling stocks has been boosted by increased sales and earnings, an appealing place to work, and an increase in client retention. Any company with stocks, as stated by Plinere, D., and Borisov, A. (2015), needs to handle its stock. For the purpose of avoiding problems like overflow and in short supply, businesses maintain adequate stocks. Through effective leadership, control over stocks could be enhanced and costs might be decreased for the company. Jose, T., Jayakumar, A., and Sijo, M. T. (2013) found a difference among the EOQ and the number of items bought. It is being made clear that the business doesn't buy supplies using EOQ. Thus, handling inventories is illogical. By using an estimation of its secure supplies, the business can figure out the amount of inventories it can store in reserves each year. As stated by Mohamad, S. J. A. N. bin S., Suraidi, N. N., Rahman, N. A. A., and Suhaimi (2016), the efficiency of managing stocks is an important area of interest for organizations. There are recommendations made to boost the effectiveness of demand forecasting, cycle counting, scattered inventory, and inventory management. Atnafu, D., and Balda, A. (2018) examine the relationship among stock control practices, competitiveness, and corporate effectiveness

with an emphasis on handling inventories. Competitiveness and efficient stock control have a favorable correlation, as per the research's data interpretation. Furthermore, increased corporate efficiency gives a business extra capacity to employ various methods for handling inventory.

IV. METHODOLOGY

The analysis is founded on primary information gathered by the company's financial executive and secondary information gathered from publications including books, journal articles, annual reports, and websites. ABC Evaluation, Inventory Turnaround proportions, the EOQ, and protective stock were some of the approaches used in the research.

4.1 Assessment and Interpretation of Data

EOQ (Economic Order Quantity) is a method used in inventory management to identify orders with lower carrying costs overall and is used to determine the ideal order quantity.

Table 1 compares the amount of every part that the organization has purchased with the number of the financial order. It is found that the amount of economic orders and the total amount of items bought are different. There persists to be potential for advancement in the business's stock management, despite the fact that it utilizes the EOQ methodology to purchase the supplies. Decreased extra stock, often known as "safety stock," is maintained on hand as a backup in case utilization increases unpredictably due to a strangely a great need or an insurmountable prolonged stream of new items.

Table 1: EOQ Calculation for the period 2020–2021

S.No	Specifics	Annual Demand	Reorder Price/ Order	Annual Handling Price/item	The EOQ	Amount purchases made in previous year
1.	Differential LD case	88170	6000	60	4252.18	23
2.	Differential HD case	26554	5000	50	2417.94	13
3.	Output Shaft LD	156994	3000	20	7604.68	21
4.	Shaft HD Output	13162	1900	10	2542.99	8
5.	Spigot shaft	59602	200	4	2600	26
6.	Shaft Selector	49000	200	4	2392.99	24
7.	Engine Head	19000	13000	600	959.762	23
8.	Housing for gearbox	580	3000	60	197.98	5
9.	Housing for clutch 1	76	2000	70	58.96	4
10.	Housing for clutch 2	200	900	40	99.95	4

Table 2: Calculation of the safety stock for 2020–2021

S.No	Products	Maximum Lead Time in Days	Average Lead Time in Days	Average Customers	Maximum Users	Annual Demand
1.	Differential LD case	100	80	300	350	88170
2.	Differential HD case	100	80	80	100	26554
3.	Output Shaft LD	100	80	500	600	156994
4.	Shaft HD Output	100	80	60	80	13162
5.	Spigot shaft	100	80	180	300	59602
6.	Shaft Selector	100	80	145	170	49000
7.	Engine Head	100	80	7	20	19000
8.	Housing for gearbox	100	80	4	7	580
9.	Housing for clutch1	100	80	3	5	76
10.	Housing for clutch2	100	80	4	7	200

Table 2 displays the computation for security reserve. A protective reserve has been determined for each item. The actual need for every item is displayed for an entire year. The lowest period of time is 40 days and the longest is 100 days. By evaluating the volume of protective supplies, the organization can decide which quantity of inventory to keep on hand at any given time of the entire year. The business will be equipped with emergency supplies to manage any circumstance. Table 2 makes it clear that the company is maintaining an adequate safety supply.

Table 3: The organization's 2020–2021 classification of A, B, and C items

Product number	Units on average	Per-unit Price	Price overall	% of the overall cost
1	60000	61.90	3714000	27%
2	17000	104.60	1778200	13%
3	130000	13	1690000	12%
4	20000	102.30	2046000	15%
5	57000	5.60	319200	2.36%
6	50000	58	2900000	21%
7	16000	50	800000	5.93%
8	600	302.40	181440	1.34%
9	70	362	25340	0.18%
10	170	178.50	30345	2.19%
Overall			Rs. 13484525	100%

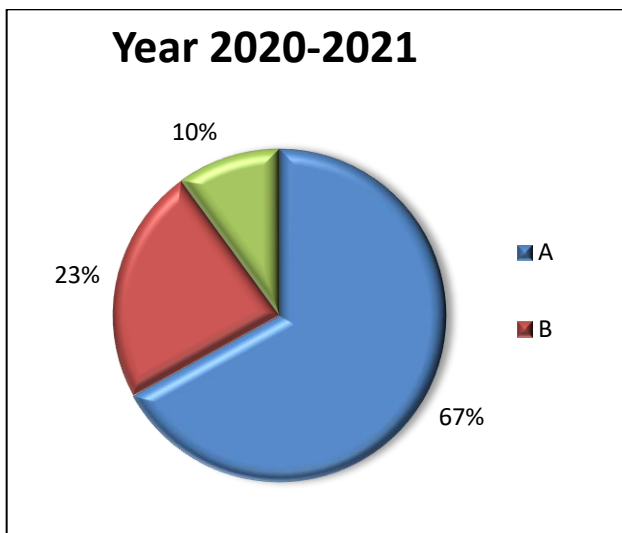


Fig 1: The organization's 2020–2021 categorizations of things into groups of three: A, B, and C.

Fig. 1 shows that 67 per cent (70 percent average) of the business's items fall into Type A, 23 percent (20 percent average) into Type B, while 10 percent fall into Class C. The organization obviously uses the ABC methodology

appropriately, but there is definitely room for improvement in terms of handling inventories.

4.2 Turnover Ratio for Inventory

Stock turnover ratio is another name for inventory turnover ratio. Sales are generated based on the calculated inventory frequency. To put it simply, it assesses the company's ability to produce revenue. The formula is gross profit divided by average inventory;

$$\text{Turnover Ratio for Inventory} = \frac{\text{Gross Profit}}{\text{Average Inventory}}$$

Table 4: Inventory Turnover Ratio over the Last Three Years at XYZ Company

Period	Gross Profit (Rs.)	Average Inventory (Rs.)	The Ratio
2018-2019	9,42,89,725	8,64,30,320	1.09:1
2019-2020	13,08,45,671	9,94,29,409	1.31:1
2020-2021	19,22,99,641	7,58,29,393	2.53:1

The trend of the stock turnover ratio is increasing, as seen in Table 4. The ratio was 1.09 in the first year to sales, increasing to 1.31 in the subsequent year and 2.53 in the third. Because sales are also rising, an upward tendency in the stock turnaround proportions is an indication of success for the business. An upward trend indicates that the corporation is keeping good track of its inventory.

V. OUTCOMES

- This is found that the company employs the EOQ approach. The organization is conducting its operations according to the stipulated EOQ limit. The way that EOQ functions is generally reasonable.
- The protective share approach can be used to determine how much merchandise the business can have on hand at any given time. The organization is known to always have enough supplies according to this analysis.
- One learns about significant elements in the organization through ABC analysis. The business manages its inventory very effectively using the ABC method. The A category has 67% of the products. There are 23% of items in the B category and 10% in the C category.
- The organization's inventory turnover ratio is acceptable. It is in accordance with its usual ratio. During the preliminary period, the proportion became 1.09; during the subsequent one, it reached 1.31; while in the final period, it reached 2.53. Because the organization's sales are also rising, an upward trend in the inventory turnover ratio is a good sign.

- Resource evaluation looks at several sorts of components, including basic supplies, ongoing work, followed by final stocks. One learned the value of the company's inventory over the previous three years through this examination. Every year, the company's inventory has grown.
- Because of the organization's notable revenue growth, its overall performance is satisfactory. Every year, the sales have risen.

illustrates that the XYZ Corporation is fairly good at managing its supplies. The methods used by the organization help keep its production processes running smoothly. The EOQ, ABC, and protective stock assessments are completed effectively and competently. The proportion of stock that is traded is additionally moving up, indicating the fact that the business's yearly profits are increasing.

VI. RECOMMENDATIONS

The organization now uses a successful structure for managing its stock, however if the results are to be enhanced, a completely novel system must be put in place. The business should also look into employing extra just in time (also known as JIT) methods for stock control. The organization will benefit from reduced workload and a reduction in the cost of maintaining stocks with the assistance of this plan of action. The organization is able to operate through quality assurance and various other operational approaches because it has adopted the principles of lean manufacturing.

VII. CONCLUSIONS

Stock control is critical for all manufacturers. It minimizes the cost of handling supplies and helps the company run its activities smoothly. The information assessment provided

REFERENCES

1. Atnafu, D., & Balda, A. (2016). The impact of inventory management practice on firms' competitiveness and organizational performance: Empirical evidence from micro and small enterprises in Ethiopia. *Cogent Business & Management*, 5(1), 1503219.
2. Jose, T., Jayakumar, A., & Sijo, M.T.. (2013). Analysis of Inventory Control Techniques- A Comparative Study. *International Journal of Scientific and Research Publications*, 3(3), 520-530.
3. Mohamad, S. J. A. N. bin S., Suraidi, N. N., Rahman, N. A. A., & Suhaimi, R. D. S. R. (2016). A Study on Relationship between Inventory Management and Company Performance: A Case Study of Textile Chain Store. *Journal of Advanced Management Science*, 4(4), 299-304.
4. Plinere, D., & Borisov, A. (2015). Case Study on Inventory Management Improvement. *Information Technology and Management Science*, 18(1), 91-96.
5. Shen, H., Deng, Q., Lao, R., & Wu, S. (2016). A Case Study of Inventory Management in a Manufacturing Company in China. *Nang Yan Business Journal*, 5(1), 20-40.
6. Sunitha, K.V. (2012). *A Study on Inventory Management in Sujana Metal Products Limited*. (Master's Report, Jawaharlal Nehru Technological University, Hyderabad).