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A Study on Inventory Management with Reference to BHEL

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ABSTRACT

Market changes, new technology, and new laws are some of the external factors examined in this study as they pertain to BHEL's inventory management. Furthermore, it explores the ways in which IT and automation might potentially increase productivity while decreasing processing times. This research has three main objectives: to provide BHEL's management with practical insights to increase operational efficiency, optimize inventory levels, and lower holding costs. The study's real-world case study on inventory management in a complex industrial setting might be useful for academics, researchers, and industry practitioners. Moreover, inventory management as a whole benefits from this case study. The main goal of this study is to analyze and assess BHEL's inventory management procedures in order to suggest strategic improvements. Storage, optimization strategies, demand predictions, and procurement are some of the inventory management components studied using quantitative analysis, case studies, and BHEL's five-year financial statements.

Introduction—

Capabilities for efficient product inventory management are provided by Inventory Management for Commerce. Merchants may find these features useful for managing shipments to satisfy client requests and keeping tabs on sales quantities, regardless of whether they operate a single storefront or a network of warehouses, pickup sites, drop shippers, and other affiliates. Provide customers with accurate, up-to-the-minute information about the Organization's saleable stock across all of its websites, monitor inventory levels, and provide shipping recommendations depending on distance or priority. Organization has the option to choose its preferred product settings on a global, per-source, and per-product basis. These technologies may be used by Organization to handle both basic and complex shipping networks, depending on the company's growth.

Some features of inventory management are as follows:

Retailers that rely on a single supplier for their products and those who work with several suppliers both have options.

- A system for keeping track of total funds made available via approved channels
- Levels of optimization for shipment matching algorithms
- Protection of several concurrent checkouts.

Inventory management's criticality

Since it impacts the profitability of operations on a daily basis, effective inventory management is crucial to a company's bottom line. New data from McKinsey & Company shows that American retailers have $740 billion worth of unsold stock. If investors manage their inventory well, they won't have to worry about losing money on unsold items. That manner, the organization may focus on activities that will lead to development.

Benefits of inventory management

There are many benefits to inventory management; however, we will just touch on the three most important ones: increased earnings, accelerated growth, and satisfied customers. Describe it to them.

1. An increase in satisfied clients : Managing inventory on a daily basis is crucial to an organization's capacity to satisfy clients. Any delay in a customer's purchase delivery might be frustrating for them. Sales and profits for the business can fall because of this. When customers get incorrect or late orders, it's frustrating for everyone. Having said that, most clients do praise the fast and accurate processing of their orders. Inventory management requires The rate at which the company delivers products to customers Organizations' reliability in meeting customer demand

2. Accelerated growth of the business: The more complicated a company is, the more complex its inventory management demands become. When more product lines, workers, production sites, and customers are involved, inventory management is more complicated. The most important thing is to be proactive. Creating a streamlined stock system from the start is essential. The more time and effort Organization needs to put it off, the more money it will end up costing.
3. Earned the most possible : The bottom line of Organization's business could benefit in a variety of ways from effective inventory management. The capacity to monitor performance and provide salespeople with up-to-date product facts is the primary capability of organizations. Besides boosting earnings and decreasing inventory expenses, it eliminates inefficiencies that lead to stockouts, overstocking, and misplaced items. In order to cut down on the time and money spent getting things ready for sale, inventory management works in tandem with purchasing and supply chain management. As a result, managing inventories takes less effort and time. Because it has such a direct impact on profits, inventory management is fundamental to the day-to-day running of every business. Production and client orders are connected via inventory. Despite the fact that there are several ways to identify and classify inventory, a company's capacity to complete orders is directly affected by its inventory management. Maintaining inventory of raw materials, safety stock, finished goods, and even packaging materials allows businesses to collect crucial ata that influences their future purchasing and fulfilment procedures. Learning purchasing habits and product turnover rates establishes the need and timeliness of inventory replenishing. You may use this information to improve customer interactions, cash flow, and profitability. It can also help you minimize money lost due to wasted inventory, stock outs, and re-stocking delays.

Research Gap

BHEL may have a substantial knowledge vacuum when it comes to studying how inventory management fits into the bigger picture of supply chain procedures. The first step is to learn the ins and outs of BHEL's supplier, manufacturing, and distribution channel inventory management system. To do so, it may be necessary to investigate the measures taken by BHEL to lessen the likelihood of stockouts, obsolescence of inventory, demand fluctuations, and interruptions in the supply chain. Improving resilience and reducing inventory-related risks might be studied by evaluating the efficacy of risk assessment methodologies, contingency planning, and inventory buffer solutions.

Objectives of the Study

- To get knowledge about inventory management
- Researching BHEL's current inventory management processes.
- To provide BHEL's management with practical insights to increase operational efficiency.
- To evaluate various inventory management systems based on their cost-benefit analyses
- To provide recommendations based on the study's results

Research Methodology

The use of both primary and secondary sources is standard procedure in the research process. Whether you should use primary or secondary sources depends on your research objectives, the resources you have at your disposal, and how much control you want to have over the data collection process.

Origin of Information Gathering

Information gleaned from books, journals, websites, newspapers, and other publicly accessible sources is known as secondary source data. The data used in this research came from secondary sources.

Descriptive Design for Research

Business Financial Statements and Inventory as an Analytical Tool

Limitations of the Study

- There's no guarantee that the data gathered is relevant to the analysis at this time.
- The data is only available for the five-year period that was chosen.
- The data has not been compared with other firms, which is one of the key limitations of the research.
- The outcomes for decision making might be correct or inaccurate based on the data analysis.

Literature of Review

A Study of Inventory Management System of Linamar India Pvt. Ltd, Pune by Anajali Mishra & Harsha Anil Salunkhe (2018): The objective of this study is to analyze the process of managing inventories. This research is significant because it will help identify and address issues with inventory management. The method consists of reviewing annual reports, doing research on-site, and conducting unstructured interviews. Inventory management is crucial in the manufacturing industry. If inventory management is not done correctly, the business will fail. It is challenging for the company to maintain precise inventory levels. There are a variety of inventory management strategies that businesses may use to maintain sustainable stock levels. Linamar India Pvt. Ltd.'s inventory management techniques are the major focus of this study, which aims to provide suggestions on how the company might improve its inventory management practices. Presently, the method for managing the company's inventory is working well.

Inventory Management Concepts and Implementations: A Systematic Review by Jean-Claude Munyaka baraka, Sarma Venkata yadavalli, (July 2022): Management relies on inventories as a critical function. Logistics and supply chain management rely on it as a core component of the material management system. In order to fulfill consumer or humanitarian demands, warehouse stock may be necessary, depending on the organization's aims. Management of inventory is crucial to the efficiency of operations and the overall success of a company. Given the ever-increasing demands on society, this research delves into the philosophy and practice of inventory management. Demand is an essential component of any inventory management system, and the definition of demand has a bearing on the management of inventory. The degree of certainty, which may be deterministic (known with certainty) or stochastic/Bayesian (knowing but uncertain), and the structural dependency, which can be either independent or dependent, are significant aspects of demand. How operational inventory management is impacted by the deterministic independent and dependent features of demand is the subject of this paper's examination.

Research paper on Inventory Management System by Punam Khobragade, Roshni Selokar, Rina Maraskolhe, Prof. Manjusha Talmale, (April 2018): Owners of hardware stores might benefit from using software known as an Inventory Management System to monitor sales and purchases. A glut of cash in the warehouse, slow sales, and dissatisfied consumers are all outcomes of badly managed inventory. By eliminating paperwork, human error, and manual delays, this project speeds the process. An excellent inventory management system allows you to track sales and stock levels, get notifications when you need to replenish, and know just how much to purchase. Inventory Management System is a Windows-exclusive application that facilitates inventory management and generates all required reports.

A Study on Inventory Management and Control by Pratap Chandrakumar, Gomathi Shankar (2017): The study's goal of increasing inventory exposure makes it vital to the company's success. Aiming to guarantee high-quality business operations, this legislation will supervise the sale of consumer items. The production company's inventory must be carefully monitored and controlled. This research will analyze the inventory management system of Abco India, a top brake manufacturer in the industry. This paper presents an analysis of ABC items within the context of SAP stock policies. There is complete coverage of all activities occurring in the inventory department. It was found that the corporation outsources demand forecasting to its suppliers rather than doing it in-house, albeit SAP handles some of this work. This is influencing the way the firm makes its products. It would be wise to work toward better demand forecasts and supplier communication. Improved inventory management and labor allocation based on demand

will allow for more output while still keeping space constraints in check. The finished items inventory drops as a consequence.

Inventory Management Pattern of manufacturing Sector in India by Toopalli Sirisha, Dr. Nalla Bala Kalyan (July 2022): All businesses are driven by the three Ps: production, sales, and profit. Whether it's a manufacturing facility or a retail store, inventory management is essential for any business. That is why this inquiry is so important. The term "inventory" refers to the stockpile of products, materials, or other monetary assets that are preserved for potential use at a later date. An analytical research design was used in this study. Books, journals, and the company's own publications are examples of secondary sources used in this study. Various statistical approaches were used in this study, including always ABC, HML, correlation, safety stock, and trend analysis. A cutting tool supply schedule must be followed by the company. All of the tools are acquired from other sources, even if there is sufficient capability to generate them. According to the research, the company does not apply sophisticated inventory management techniques. Subcontractors are being entrusted with a share of the raw materials by the firm for processing.

The impact of Inventory Management Practice on Firm's Competitiveness and Organizational Performance: Empirical Evidence from Micro and Small Enterprises in Ethiopia by Daniel Atnafu, Assefa Balda (July 2018): Gathering information on the effects of inventory management strategies on company performance and competitiveness was the driving force behind this study. Structural equation modeling (SEM) was used to investigate the conceptual framework's assumptions and connections. One hundred eighty-eight micro, small, and medium-sized enterprises (MSEs) in the manufacturing subsector contributed data to the research. Increased inventory management approach may lead to a competitive advantage and greater organizational performance, according to the results. A competitive advantage may also increase the effectiveness and output of a company. Policymakers, academic institutions, non-governmental organizations (NGOs), and anyone else assisting micro, small, and medium-sized enterprises (MSEs) should prioritize providing the training and resources necessary to promote inventory management methods in order to enhance MSEs' organizational performance and competitiveness. Because of such, their influence on the expansion of the national economy would be much greater. Conclusions cannot be extended to large-scale or overall sectors since this study just addresses the manufacturing sub-sector from the standpoint of MSEs.

Data Analysis and Interpretation

Inventory Turnover Ratio

This ratio shows the efficiency of the firm in the producing and selling of the products

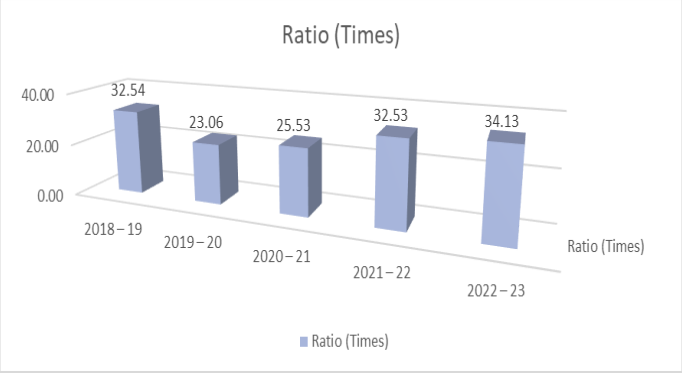
Inventory Turn Over Ratio

$$= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Inventory Turn Over Ratio

Rs. In Crores

Year	Cost of Goods Sold	Avg Inventory	Ratio (Times)
2018 – 19	253780	7800.04	32.54
2019 – 20	205455	8908.23	23.06
2020 – 21	183653	7194.45	25.53
2021 – 22	213396	6560.21	32.53
2022 – 23	230587	6755.9	34.13



Interpretation

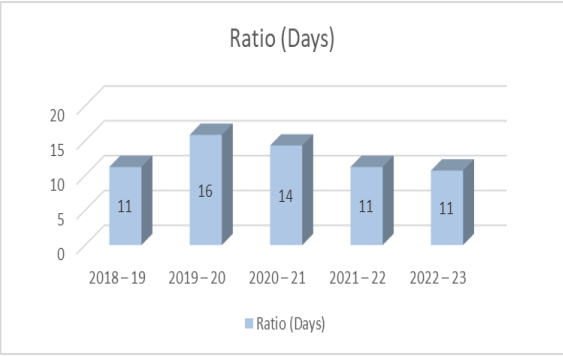
From the above data of observation, we can state that, Inventory Turn Over Ratio has decreased from 2018-19 to 2019-20 year i.e., from 32.54 to 23.06, later on from 2019-20 to 2022-2023yr the ratio was increased gradually year by year from 23.06 to 34.33.

Inventory Holding Period

The amount of time that passes between the acquisition and sale of an asset is called its holding period. Generally speaking, a holding duration of one year or more is considered long term, whereas a holding period of less than a year is considered short term.

$$\text{Inventory Holding Period} = \frac{365}{\text{Inventory Turnover Ratio}}$$

Year	Days	Inventory Turnover Ratio (Times)	Ratio (Days)	Ratios Rounded off (Days
2018 – 19	365	32.5357	11.21	11
2019 – 20	365	23.0635	15.82	16
2020 – 21	365	25.527	14.29	14
2021 – 22	365	32.5288	11.22	11
2022 – 23	365	34.1312	10.69	11



Interpretation

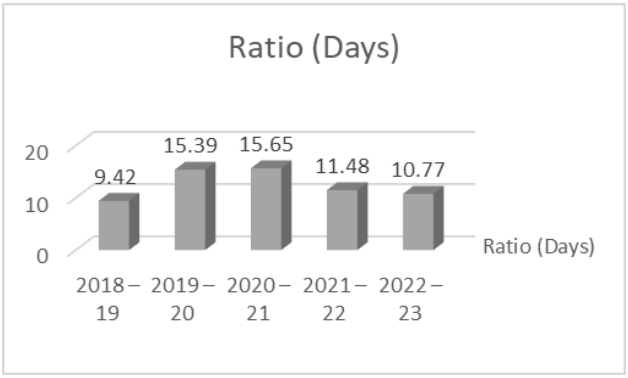
From the above data observations we can state that, Inventory Holding Period was highest in the year 2019--2020 i.e. 16 days and lowest Invetory Holding Period was in the year 2018-19, 2021-22, 2022-23 i.e.11

Inventory Conversion Period

This ratio illustrates the pace of revenue generation from inventory by showing the number of days it takes to turn stock into net sales.

$$\text{Inventory Conversion Period} = \frac{\text{Inventory}}{\text{Sales}} \times 365$$

Year	Inventory	Sales	Ratio (Days)	Ratios Rounded off(Days)
2018 – 19	7800.04	302156	9.42	9
2019 – 20	8908.23	211195	15.39	15
2020 – 21	7194.45	167765	15.65	16
2021 – 22	6560.21	208441	11.48	11
2022 – 23	6755.9	228912	10.77	11



Interpretation

From the observation of the data we can state that, Inventory Conversion Period is highest in the year 2020-2021 i.e. 16 days and Lowest in the year 2021-2022 & 2022-2023 i.e. 11 days

Average day to Sell Inventory Ratio

The average number of days it takes for a firm to convert its inventory (including WIP) into revenue is shown by this financial ratio.

$$\text{Average Days to Sell Inventory Ratio} = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} \times 100$$

Interpretation

From the above observation data we can state that, Average Days to Sell Inventory is 2 days in the year 2018-19, 2019-20, 2020-21, 2021-22 and 1 day in the year 2022-23

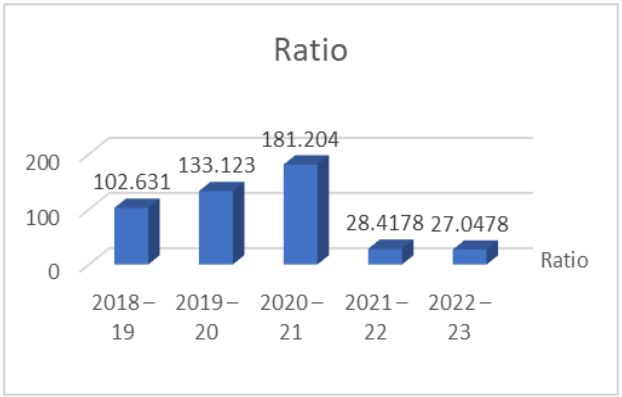
Raw Materials Conversion Period

Raw materials will be maintained in the warehouse for what is stated in this ratio as the number of days before being delivered to the production department for work-in-progress. A shorter raw material holding duration suggests that a corporation may recoup more of its manufacturing costs, while a longer one signals higher warehouse costs and lower profits.

Raw Material Conversion Period

$$= \frac{\text{Raw Material Inventory}}{\text{(Raw Material Consumption / 365)}}$$

Year	Raw Material Inventory	Raw Material Consumed	Raw Material Consumed / 365	Ratio
2018 – 19	4325.35	15382.9	42.1448493	102.631
2019 – 20	4425.15	12133	33.2409863	133.123
2020 – 21	4193.65	8447.3	23.1432877	181.204
2021 – 22	414.75	5327.07	14.5947123	28.4178
2022 – 23	465.33	6279.46	17.204	27.0478



Interpretation

From the above Observation Data we can state that, Rawmaterial Conversion Perion is highest in the year 2020 – 21 i.e.181.20 and Lowest in the year 2022-2023 i.e. 27.04

Year	Inventory	Avg Inventory	Cost of Goods Sold	Ratio	Rounded off Avg. No. of Days
2018 – 19	7800.04	3900.02	253780	1.53	2
2019 – 20	8908.23	4454.12	205455	2.16	2
2020 – 21	7194.45	3597.23	183653	1.95	2
2021 – 22	6560.21	3280.11	213396	1.53	2
2022 – 23	6755.9	3377.95	230587	1.46	1

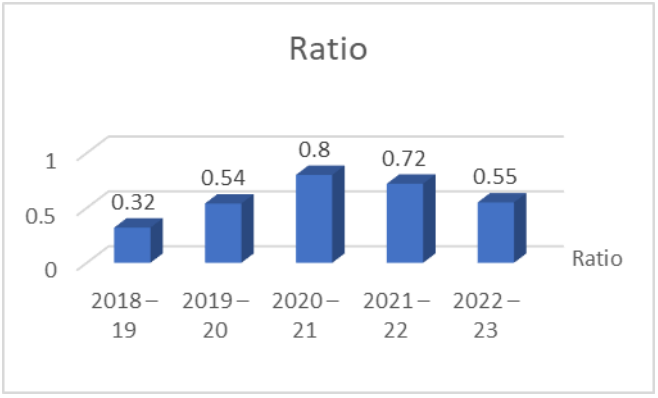
Work in Progress

This ratio shows how long it takes for the firm to turn their WIP into completed items. The shorter time work is held, the less money will be blocked from the company's accounts.

Work in Progress Conversion Period

$$= \frac{\text{Work in Progress}}{\text{Cost of Production / 365}}$$

Year	Work In Progress	Cost of Production	Days	Cost of Production /365	Ratio
2018 – 19	223.21	253780	365.00	695.29	0.32
2019 – 20	306.74	208455	365.00	571.11	0.54
2020 – 21	403.21	183653	365.00	503.16	0.80
2021 – 22	422.32	213396	365.00	584.65	0.72
2022 – 23	344.59	230587	365.00	631.75	0.55



Interpretaion

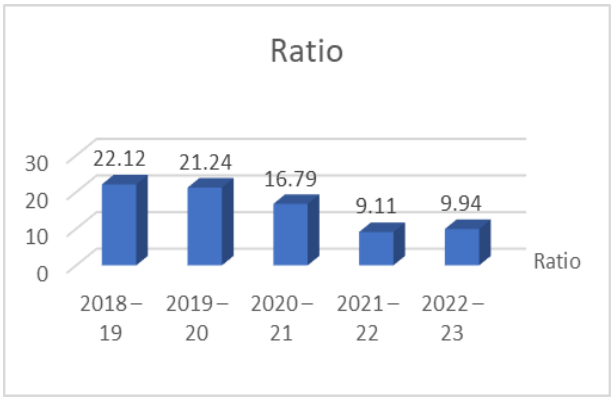
From the above data we can state that, work in progress conversion period is highest in the year 2020-2021 i.e 0.80 days and lowest in the year 2018-19 i.e. 0.32

Finished Goods Conversion Period

There are two possible definitions of this term: the amount of time it takes for completed items to sell out or the amount of time finished goods sit in a warehouse before they are sold.

Finished Goods Conversion Period
= Finished Goods Inventory
Cost of Goods Sold / 365

Year	Finished Goods	Cost of Production	Days	Cost of Goods Sold /365	Ratio
2018 – 19	15382.87	253780	365.00	695.29	22.
2019 – 20	12132.96	208455	365.00	571.11	21.
2020 – 21	8447.30	183653	365.00	503.16	16.
2021 – 22	5327.07	213396	365.00	584.65	9.
2022 – 23	6279.46	230587	365.00	631.75	9.94



Interpreation

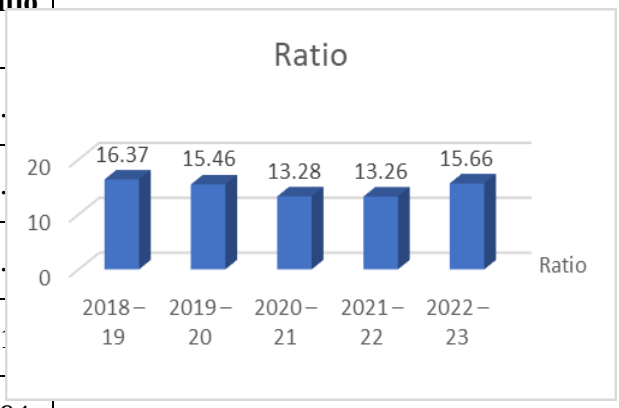
From the above observation data we can state that, Finished Goods Conversion Period is Highest in the year 2018-19 i.e. 22.12 and the lowest in the year 2021-2022 i.e. 9.11

Days Payable Outstanding Ratio

As an efficiency ratio, it indicates how long it typically takes business to pay its vendors.

Days Payable Outstanding Ratio =
Accounts payable x 365
Cost of Sales

Year	Account's Payable	Cost of Goods Sold	Ratio
2018 – 19	11380.98	253780	16.37
2019 – 20	8829.16	208455	15.46
2020 – 21	6683.51	183653	13.28
2021 – 22	7749.59	213396	13.26
2022 – 23	9895.83	230587	15.66



Interpretation

From the above observation data we can state that, Days Payable outstanding Ratio is highest in the year 2018-19 i.e.16.37 and lowest in the year 2021-22 i.e. 13.26

Findings

- Inventory Turn Over Ratio has decreased from 2018-19 to 2019-20 year i.e., from 32.54 to 23.06, later on from 2019-20 to 2022-2023yr the ratio was increased gradually year by year from 23.06 to 34.33.
- Inventory Holding Period was highest in the year 2019--2020 i.e. 16 days and lowest Invetory Holding Period was in the year 2018-19, 2021-22, 2022-23 i.e.11
- Inventory Conversion Period is highest in the year 2020-2021 i.e. 16days and Lowest in the year 2021-2022 & 2022-2023 i.e. 11 days

- Average Days to Sell Inventory is 2 days in the year 2018-19, 2019-20, 2020-21, 2021-22 and 1 day in the year 2022-23
- Rawmaterial Conversion Perion is highest in the year 2020 – 21 i.e.181.20 and Lowest in the year 2022-2023 i.e. 27.04
- work in progress conversion period is highest in the year 2020-2021 i.e 0.80 days and lowest in the year 2018-19 i.e. 0.32
- Finished Goods Conversion Period is Highest in the year 2018-19 i.e. 22.12 and the lowest in the year 2021-2022 i.e. 9.11
- Days Payable outstanding Ratio is highest in the year 2018-19 i.e.16.37 and lowest in the year 2021-22 i.e. 13.26
- Current Ratio for all the years showing below than the standard ratio which is 2:1. SO companies Liquidity Position is weak.

Suggestions

- The longer the inventory conversion period was in 2018–19 and 2019–20 compared to earlier years, the more likely it is that the company's funds will be frozen for a longer length of time. Thus, it advised that they give this their whole attention.
- The company's weak liquidity situation is shown by its declining current ratio and the fact that it failed to maintain an accurate standard ratio over the last five years, which was 2:1. Therefore, in order to boost short-term liquidity, the corporation should stick to the standard ratio.
- The application of modern technologies like RFID, IoT, and AI to enhance inventory management in terms of accuracy, efficiency, and visibility will be investigated.
  Think about the benefits and drawbacks of the new inventory management software before deciding to use it.
- Evaluate the role of reserves in strengthening supply networks against shocks like global infections or severe weather (e.g., pandemics).
  Try to find a middle ground by combining lean inventory practices with a strong supply chain. Find out more about the connection between accurate demand forecasts and effective inventory management.
- Advice on how to improve demand estimates and the resulting impact on inventory levels is provided. Investigate the connections between vendor management strategies, lead times, and inventory performance.
- Look into the possibility that supplier collaboration might lead to improved inventory management. To better manage inventory, you should study up on the effects of Omni channel fulfillment and the meteoric rise of online purchasing.
- Consider the benefits and drawbacks of synchronizing inventory across several platforms. Examine the environmental impacts of traditional inventory management practices. It is advised that you evaluate eco-friendly inventory management strategies that lessen waste and your influence on the natural world.
- Finding the connection between inventory, working capital efficiency, and business performance is the next step.
- Optimize inventory turnover without compromising customer service quality by finding the sweet spot. Ascertain the ways in which companies alter their inventory strategies during periods of economic downturn or crisis.

Conclusion

If businesses want to simplify their supply chain, increase their financial results, and adapt to the ever-changing needs of the market, they must conduct a comprehensive analysis of inventory management. Among other significant areas, the research may provide solutions that enhance inventory management in terms of resilience, sustainability, and efficiency. Companies may adapt to shifting market circumstances and enhance their inventory management processes by delving into these areas. To succeed in the long run in industries that are continually evolving, one must stay abreast of the most recent thinking on inventory management.

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