

A Study of Inventory Management at ‘Shrinanda Industries Raipur’

ARUN KUMAR¹, DR. SUMITA DAVE²

¹ Student, Amity University Chhattisgarh

² Director, Amity Business School Amity University Chhattisgarh

Abstract- *Inventory management is a process which helps the organizations to fulfil their required supplies during the period of production and operating activities which help in increase in efficiency and effectiveness of the organizations. Shrinanda Industries is a manufacturing unit located in urla they manufacture Railway Bolts for different companies. The objective of this study is to understand the techniques of inventory management done in Shrinanda Industries and their techniques to maintain their required inventories in stock so that they can maintain regular production cycle. This study is based on competitor’s analysis of two manufacturing industries ‘Shrinanda Industries’ and ‘Pankaj Steels’ all the data is collected directly through top level management by Interview method. During the study there were few findings like there are many competitors in market and heavy dependency upon man power management. conclusions by this study are organizations can develop better polices for their Inventory management techniques and their operations.*

Indexed Terms- *Inventory Management, Stock Keeping Units, Techniques of Inventory Management and Production Cycle and Operation Cycle.*

I. INTRODUCTION

Inventory management refers to the process of ordering, storing, using, and selling a company's inventory. This includes the management of raw materials, components, and finished products, as well as warehousing and processing of such items. There are different types of inventory management, each with its pros and cons, depending on a company's needs.

A company's inventory is one of its most valuable assets. In retail, manufacturing, food services, and other inventory-intensive sectors, a company's inputs and finished products are the core of its business. A shortage of inventory when and where it's needed can be extremely detrimental.

At the same time, inventory can be thought of as a liability. A large inventory carries the risk of spoilage, theft, damage, or shifts in demand. Inventory must be insured, and if it is not sold in time it may have to be disposed of at clearance prices—or simply destroyed.

Inventory is defined as a list of goods and materials which are available in stock for business. In accounting inventory is considered as an asset. Inventory management is about specifying the size and the placement of stocked inventory. Inventory management is essential for different locations or within multiple locations for a supply network to protect the regular and planned production against running out of materials or goods. The scope of inventory management also concerns with the fine lines between stock up of lead time, carrying costs, forecasting of inventory, physical inventory, space available for inventory, quality management, stock up, returns of defective goods and demand forecast of inventory. Inventory management deals with: -

- (i) Active control program which deals with the management of sales and purchase department.
- (ii) It helps in providing good understanding of inventory and capacity to control financial cost.
- (iii) It will provide control over operating cost.
- (iv) It will help in identifying the inventory requirement, stock up techniques and actual and projected inventory status.

• Objective –

1. To find which method of inventory management techniques is used by firms and minimum

- inventory levels.
2. To study the operating cycle from raw materials to finish product
 3. To study the inventory control management is working regularly and increases the production and final outcome.
 4. To study the differences in their product line like their pricing, quality.

II. LITERATURE REVIEW

Rashmi Ranjan Panigrahi, Duryodhan Jena (2021), Inventory management practices (IMP) are prevalent in managing and controlling inventory in an organization. The study aims to measure the performance of steel manufacturing firms by determining the effect of distribution turnover and inventory automation over competitive strength and operational efficiencies. From the extant literature, it is evident that the above relationship is very limited in the Indian context. Data were collected from five selected manufacturing firms from the state of Odisha, India. Respondents of the study are some key officials, viz. operations manager, production manager, purchase manager and warehouse manager from various manufacturing firms. As per the need of the study, various statistical tools such as correlation, multiple regression, confirmatory factor analysis and Kolmogorov-Smirnov test were used. The outcome of the study concludes that IMP has significant impact on firm performance and also contributes to the existing body of knowledge by helping inventory management practitioners of manufacturing industry.

Shuai Zhang, Kai Huang, Yufei Yuan (2021), Spare parts are held as inventory to support product maintenance in order to reduce downtime and extend the lifetime of products. Recently, spare parts inventory management has been attracting more attention due to the “right-to-repair” movement which requires that manufacturers provide sufficient spare parts throughout the life-cycle of their products to reduce waste so as to achieve sustainability. In this review, 148 papers regarding spare parts inventory management published from 2010 to 2020 are examined. The studies are classified based on two groups of perspectives. The first group includes the characteristics of spare parts, products, inventory systems, and supply chains, while the second group

focuses on the characteristics of research methodologies and topics in the reviewed studies. The novelty of this literature review is three-fold. Firstly, we focus on analyzing the supply chain structure of different inventory networks for managing spare parts. Secondly, we classify the current literature based on analytics techniques, i.e., descriptive analytics, predictive analytics, and prescriptive analytics. Finally, the research gaps in this field are discussed from the perspective of reverse logistics, consumer durable goods, inventory network structure and policy, spare parts demand pattern modeling, and big data analytics.

S S Islam, A H Pulungan and A Rochim (2019), The research aims to examine factors that affect inventory mismanagement in a Small Medium Enterprises (SME), which is a market leader in the Heavy Equipment Spare Part Industry. Despite its status as market leader, the company deals with various inventory problems, for examples slow-moving stocks, delivery delays to customers, and so forth. Those problems, at the end, may reduce company's profit. In order to determine the main factors, this study applies quantitative and qualitative methods. Quantitative methods, specifically Pareto diagram and Inventory Turnover Ratio (ITR), are mainly used to evaluate sales and inventory management. ITR is affected by spare part quantity, warehouse area used, and the material amount. The top five ITR ratings are examined further through observation, interview, and questionnaire techniques. Meanwhile, the qualitative method is applied to evaluate the company's inventory information systems, procedures and coordination's among departments, and human resources. Our findings suggest that the unintegrated company's information system and lack of qualified human resources are the main factors affect inefficient inventory management. The research benefits to industry by suggesting the importance of information systems and human resources to inventory management. As for academics, this research enriches inventory management literature.

Pradeep Kumar Shetty, C. Raghavendra Kamath (2018), Inventory Management is a widely misinterpreted technique that is not receiving the due attention it deserves. It can be crucial to an industry's production operations especially to small-scale

manufacturing plants where even a minimum savings value results in an increased profit margin. The purpose of this study was to evaluate the present-day procurement behaviors and contrast it with mathematically concluded options thereby formulating an entire Inventory model around it. The research was conducted by visiting two industries, namely Rainbow Industries and Karnataka Closures and collecting relevant data. It was found that both industries followed a JIT model of procuring raw material. Further analysis of said data suggested that by implementing an Economic Order Quantity (EOQ) model, both industries could procure an increased quantity of raw material while saving a substantial amount of capital in procurement charges. This would also increase production rates. The analysis techniques utilized were EOQ and ABC Classification of Finished Goods. Additionally, the scope of the study extends to any management or executive personnel looking to reinvent and optimize production capacities using effective tools.

Hong Shen, Qiang Deng, Macau Rebecca (2017), In this paper, we focus on inventory management in a manufacturing company in China. This study aims to identify the key factors that influence inventory management practices, investigate efficient and effective inventory management approaches, and examine the impact of supplier cooperation on supply chain improvement. A case study approach is used to identify the key factors that influence inventory management in a factory. Efficient and effective inventory management practices are derived from the case study and may provide practical guidance for foreign manufacturers in China. This study provides a valuable tool for identifying the key factors in inventory management which can be applied to similar problems encountered in actual manufactories.

Aashna Sharma, Vivek Arya (2016), Inventory: stock file of all the products that the organization has made for sale and the components that make the product. Every organization requires inventory for smooth running of its activities or we can say processes. The inventory is link between the production and the distribution process. The role of inventory management is to check the availability of material as and when required the quantity of the inventory and if it's possible to minimize the investment in inventory.

In today's competitive world of manufacturing companies are searching new ways of improving the industry process, how to satisfy the customer and by following this how they can stay ahead with their competitors in the world of competition. The strategy that can bring these things to life for past decades. This represents that money will be tied up until the inventory leaves the company as purchased products, due to large size of inventories maintained by firms a amount of funds are required. It is therefore absolutely imperative to manage inventories efficiently and effectively in order to ignore the unnecessary investments. A firm who is neglecting the managing of inventories will be at risk at its long run profitability and may fail ultimately. The reduction in excessive inventories carries an appreciable impact on the company's profitability.

Pawan Kumar, Manav Rachna (2014), Inventory constitutes the most significant part of majority of Indian manufacturing industries. Because of the huge inventories maintained by most firms, a considerable sum of an organization's fund is being committed to them. Thus it becomes absolutely imperative to manage inventories efficiently so as to avoid the costs of changing production rates, overtime, sub-contracting, unnecessary cost of sales and back order penalties during periods of peak demand. The main objective of this study is to control inventories in the AMTEK AUTO LIMITED, Bhiwadi Plant by using the various existing tools of optimization in inventory management. The study methods employed includes the variance analysis, Economic Order Quantity (EOQ) Model and the Chi-square method. The answer to the fundamental question of how best an organization handles inventory by using various optimization techniques. Consequently, recommendations on the right quantity, quality and timing of material, at the most favorable price conclude the research study.

Timothy Lwika, Patrick Boniface Ojera, Nebat Galo Mugenda, Virginia Kirigo Wachira (2013), Manufacturing firms apply various techniques in the management of their inventories. The practices adopted have a significant impact on returns, profitability and volume of sales. Manufacturing firms that efficiently apply these practices have an excellent financial performance. This paper examines the

impact of inventory management practices on the financial performance of sugar manufacturing firms in Kenya, by analyzing the extent to which lean inventory system, strategic supplier partnership and technology are being applied in these firms. The research survey was conducted in all the eight operating sugar manufacturing firms from the period 2002- 2007. The primary data was collected using structured and semi- structured questionnaires administered to key informants in the organizations. Secondary data was obtained from annual financial performance statements available in the year Book sugar statistics. Descriptive statistics was used to test the impact of inventory management practices and Correlation analysis was used to determine the nature and magnitude of the relationship among inventory management variables. The results indicate that there exists a positive correlation between inventory management and Return on Sales ($r=0.740$) and also with Return on Equity ($r=0.653$) which were found to be statistically significant at 5% level.

Letizia Tebaldi, Barbara Bigliardi, Serena Filippelli, Eleonora Bottani (2023), The present paper proposes a study carried out in an Italian company operating in the railway industry, whose aim was to simulate two inventory management policies, namely the Economic Order Quantity (EOQ) and the Economic Order Interval (EOI) and compare the relating results from a set of simulations with historical data. The simulation was carried out on 53 articles (37 raw materials and 16 work in progress). The two models were developed under Microsoft Excel™, and their effectiveness was assessed in terms of amount of effective stock and the total costs associated; specifically, total costs are composed of three cost items: (i) order/production, (ii) stock keeping and (iii) stock out. Overall, both models returned better results in terms of economic saving and amount of stock than the current management policy used by the company; more specifically, the EOQ policy turned out to be the best, and was then selected for being implemented in the whole warehouse under investigation. Moreover, from a theoretical perspective, the need for a literature review on inventory management models emerged.

Craig Fleisher and Babette Bensoussan (2020) “STRATEGIC AND COMPETITIVE ANALYSIS: Methods and Techniques for Analyzing Business

Competition” Given the priority of competitiveness in modern companies, practitioners of competitive or strategic corporate intelligence (CI) need to come to terms with what business and competitive analysis is and how it works. More importantly, they need to be able to convert the wealth of available data and information into a valuable form for decision-making and action. Collected data must be converted into intelligence. This is accomplished through analysis. Strategic and Competitive Analysis comprehensively examines the wide spectrum of techniques involved in analyzing business and competitive data and information including environmental analysis, industry analysis, competitor analysis, and temporal analysis models. It helps business analysts and decision-makers to draw effective conclusions from limited data and to put together information that does not often fit together at first glance

Oster, Sharon M (2014), This shows that combining a sound understanding of economic and managerial principles can make a striking difference in the quality of the strategic planning of an organization and provide guidelines for effective corporate strategies. Covering new and important areas in economics not treated in other management and strategic planning books, Modern Competitive Analysis is a fundamental resource to the managers of today and tomorrow. The Third Edition includes new material in game theory, added value analysis and strategic intent. Examples are drawn from modern network industries and more attention is paid to newly deregulated markets.

Sajee B. Sirikrai, John C.S. Tang (2016), Industrial competitiveness is an important issue for countries pursuing export-oriented industrialization policies. Assessing the competitiveness of an industry is a complex process and it can be analyzed from several perspectives. This paper proposes that the aggregate performance of many firms in a particular industry can reflect the competitiveness of that industry as a whole. Based on theories from strategic management and operations management research, it presents an AHP-based model to comprehensively explore the varying degrees of importance of the indicators and drivers of industrial competitiveness. The model helps to identify the degree to which organizational performance indicators are important when assessing industrial competitiveness. Further, it helps to evaluate

the importance of particular factors that drive firms to perform better. The paper presents an application of this model by applying it to the automotive components industry in Thailand.

Michael E. Porter (2021), Strategy may not be the most dynamic word in the business lexicon, but reports of its death as a core discipline are premature. The analytical approach to strategy first put forward in 1980 by Professor Michael E. Porter of the Harvard Business School was a watershed in business analysis. Measuring Business Excellence Revisits Competitive Strategy, Professor Porter's seminal work, and finds that it remains a powerful framework for understanding the competitive situation faced by today's organizations.

Douglas M. Lambert, Arun Sharma (2004), Evidence suggests that the recent interest in competitive strategy and competitive positioning, while good in itself, has resulted in the management of many firms placing too much emphasis on competitive performance and too little emphasis on customer expectations. This research in the chemical industry provides support for the conclusion that management needs to refocus on the customer if US companies are going to succeed in the increasingly competitive marketplace. A methodology is presented that can be used by management to collect and analyze customer-based competitive data for use in establishing priorities for customer service expenditures.

Warren Briggs, Barry Shore (2013), The purpose of this paper is two-fold: first, it sets out to suggest that when a new ERP system or an upgrade is considered it may be best to begin with a formal analysis of the market leader's IT strategy. This study must address how they use information across the extended enterprise from suppliers to customers. Second, it aims to suggest a simple competitive audit matrix (CAM) that can be used to structure this analysis.

Shekhar Jayanthi, Bart Kocha, Kingshuk K. Sinha (2009), we present a model-based approach for competitive analysis of manufacturing plants. As part of this approach, we propose the application of Operational Competitiveness Ratings Analysis (OCRA) to measure the competitiveness of plants in terms of their relative inefficiency. We then present a

conceptual framework to classify and identify the drivers of plant competitiveness in terms of decisions related to plant structure and infrastructure. Finally, we demonstrate the application of this model-based approach to conduct competitive analysis of plants in the US processed food industry.

III. RESEARCH METHODOLOGY

This study is based on primary data all the data is collected directly from Managing Director from Shrinanda Industries and Pankaj Steel about their inventory management levels like how they operate the differences in organizations and their polices, production cycle, cost operating, resources management and other things that effect the inventory management and their production cycle. While collecting data Interview method was used and conducted in both the organizations.

IV. DATA INTERPRETATION

This study is conducted to identify the problems faced during the period of production and their techniques and stock keeping. The data is collected by top management about their operations and strategies used to sustain for long period of time. Data is analysed by using competitor side by side analysis. The study states about their production levels, inventory management techniques, stock management, operation cycle and other factors that affect levels of production.

V. FINDINGS

- Too much dependency on man force in both the organizations.
- Minimum safety equipment's are provided in both the organizations.
- Man force are not properly skilled and trained to operate heavy machinery in organizations.
- Just in Time inventory management is done most of the times
- Creditors bill payments are done on lately basis.
- There are heavy demands for Bolts and Plate screws but unable to fulfil the requirements.
- There are many competitors in market.
- Separate funds have been allotted for each

operating activities in both the organization.

- Both the organizations believe in inventory management techniques and operates stock safety check in required period of time.
- Regular checks in stock keeping is done so that maximum output can be produced.

CONCLUSION

The study states that inventory management practices have improved management of organizations and to develop their future planning with proper quality and work efficiency with effectiveness of resources at workplace culture. The proper supply of inventories has increased the overall production and helps in achieving maximum profits during the operation cycle. It has also helped in waste management through regular inventory checks by proper availability of resources available on time. The overall benefit has effected in total production done in a particular day has been increased and new orders have been received in organization. Inventory management techniques has developed the organizations to keep minimum stock at their work place so that may not affect the daily operations. The product life cycle has been reduced to minimum days from raw materials to finished product. By doing competitor's analysis of Shrinanda Industries and Pankaj Steels there has been differences in their work culture, production cycle, and many more. Both the companies are leading manufacturer of Rail Bolts and Plate screws but when it comes to product diversity Pankaj Steels is leading the market with their market operations and their supplies in market so that they are able to make more production at a period of time and also having more no. of customers available in market place.

REFERENCES

- [1] Abbot, R. (1977). Inventory management Simulation with Applications. PhD thesis, department of economy, University of Michigan, Michigan USA.
- [2] Belien, J. & Force, H. (2012). Supply chain management of blood products: A literature review. *European Journal of Operational Research*, 217(1), 1–16.
- [3] Blake, J. (2009). On the use of operational research for managing platelet inventory and ordering. *Transfusion Editorial*, 49(3), 396–401.
- [4] Chazan, D. & Gal, S. (1977). A Markovian model for a perishable product inventory. *Management Science*, 23(5), 512–521.
- [5] De Kort, W., Janssen, M., Kortbeek, N., Jansen, N., Der Wal, J., & Van Dijk, N. (2011). Platelet pool inventory management: Theory meets practice. *Transfusion*, 51(11), 2295–3303.
- [6] Deniz, B., Karaesmen, I., & Scheller-Wold, A. (2010). Managing perishables with substitution: Inventory issuance and replenishment heuristics. *Manufacturing and Service Operations Management*, 12(2), 319–329
- [7] Grant, G. (2013). Integration of supply and marketing for a inventory management. *Management Research Review*, 33(2), 123–133.
- [8] Coslett, Brooke Gibson, "Just-In-Time/Just-In-Case Inventory Management as an Influence on Supply Chain Disruption in Medical Systems Based in the Southeastern United States During the COVID-19 Pandemic" (2022). *Doctoral Dissertations and Projects*. 3635
- [9] Orobia, L.A., Nakibuuka, J., Bananuka, J. and Akisimire, R. (2020), "Inventory management, managerial competence and financial performance of small businesses", *Journal of Accounting in Emerging Economies*, Vol. 10 No. 3, pp. 379-398.
- [10] Özkaya, Banu Yüksel, Ülkü Gürler, Emre Berk. 2006. The stochastic joint replenishment problem: A new policy, analysis, and insights. *Naval Research Logistics (NRL)* 53(6) 525–546.
- [11] Pantumsinchai, Pricha. 1992. A comparison of three joint ordering inventory policies. *Decision Sciences* 23(1) 111–127.
- [12] Petruzzi, Nicholas C, Maqbool Dada. 1999. Pricing and the newsvendor problem: A review with extensions. *Operations Research* 47(2) 183–194.
- [13] Pinsky, Mark, Samuel Karlin. 2010. An introduction to stochastic modeling. Academic press.
- [14] Rachamadugu, Ram. 1988. Error bounds for eoq. *Naval Research Logistics (NRL)* 35(5) 419–425.

- [15] Rao, Uday S. 2003. Properties of the periodic review (r, t) inventory control policy for stationary, stochastic demand. *Manufacturing & Service Operations Management* 5(1) 37–53.
- [16] Renberg, B, R Planche. 1967. Un modele pour la gestion simultanee des n articles d'un stock. *Revue Francaise d'Informatique et de Recherche Operationelle* 6 47–59.
- [17] Sarker, Bhaba R, Mahmood Al Kindi. 2006. Optimal ordering policies in response to a discount offer. *International Journal of Production Economics* 100(2) 195–211.
- [18] Serfozo, Richard. 2009. *Basics of Applied Stochastic Processes*. Springer Science & Business Media.
- [19] Shaked, Moshe, J George Shanthikumar. 1988. Stochastic convexity and its applications. *Advances in Applied Probability* 427–446.
- [20] Silver, Edward Allen, David F Pyke, Rein Peterson, et al. 1998. *Inventory management and production planning and schedulingx*, vol. 3. Wiley New York.