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Inventory Reduction and Accurate planning of the Material at Larsen &Toubro limited, Powai, Mumbai

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Abstract:- Inventory management helps in controlling inventory, knowing visibility and traceability on quantities in hand and cost reduction. This paper highlights research work carried out at L & T , Pawai, regarding reduction of inventory and accurate planning of the hardware material. It was found that there was difference between the physical stock and the stock shown in the system. This led to the problems of excess stock and excess shortages. Hence the supplier was always under pressure to supply large quantity in short period. So the relations between the suppliers and L&T were not good.

Two methods viz. BOM purification and MRP controller transfer were used for the collection, analysis, reducing inventory and accurate planning.. At the end of research work, the factious inventory cost on SSG Department Head. 44.82 lakhs have been transferred from SSG Department

It was suggested to L & T to do automation of procurement of the hardware, handover forms regarding MRP controller transfer and regular check of the stock should be done to save man hours and less calls for errors. The researchers also tried to solve the problems of the suppliers by designing "Six Golden Rules" for smooth functioning.

I. INTRODUCTION

1.1 Supply Chain Management:

Supply chain management is the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole. Supply chain management is a cross-function approach including managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end-consumer.
A manager should track the days payable outstanding, average purchase price, range of purchase price, average purchase quantity, fraction on-time deliveries, supply quality and the supply lead time

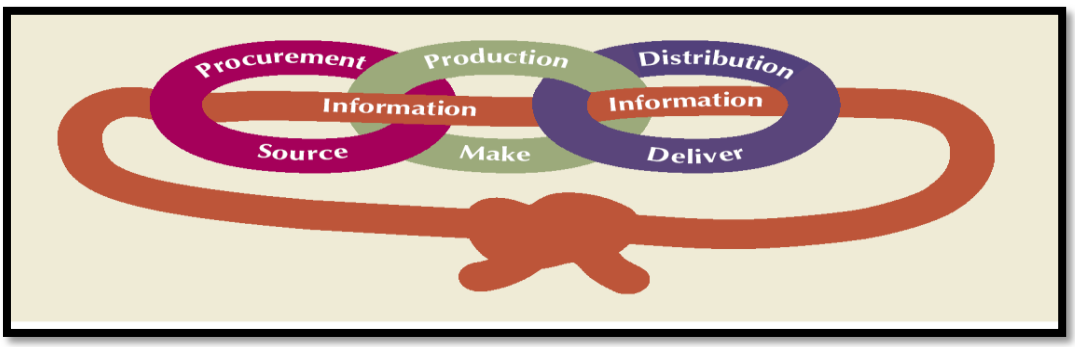


Figure 1: Supply chain functioning

1.2 Inventory

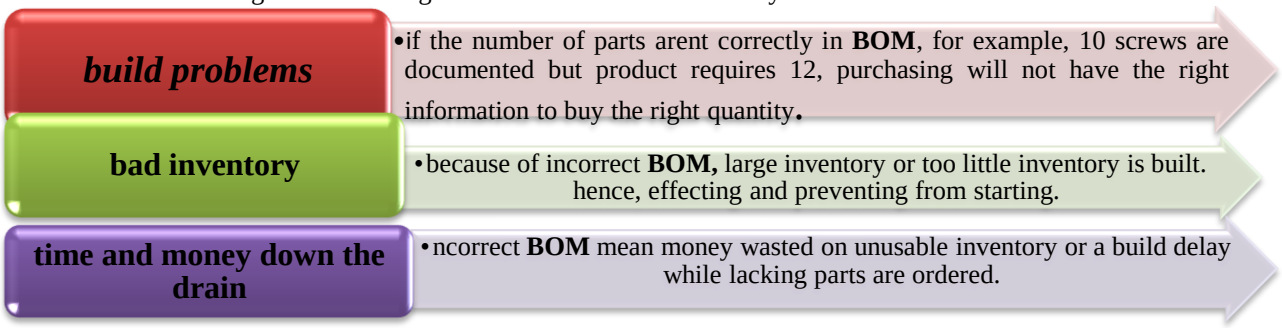
Inventories are materials and supplies that a business or institution carry either for sale or to provide inputs or supplies to the production process. All businesses and institution require inventories. Often they are a substantial part of total assets.

Objectives of inventory is customer service, Timely delivery, buffering against uncertainty, providing variety, efficiency. Principles of effective purchasing is Right Quality, Right Quantity, Right Time, Right Price, Right Source And Deliver, Right Place.

1.3 BOM Purification

"A bill of material is a list of the raw materials, sub-assemblies, intermediate assemblies, sub components, parts and the quantities of each needed to manufacture an end product".

- It prepares the company for success and prevents needless extra work for engineering, manufacturing, sourcing, purchasing in the long run.
- Better preparation for manufacturing department for production runs and supports the new introduction process along the way.
- Better Planning and scheduling in the future will be without any hurdles after correct BOM.



1.4 MRP Controller

The MRP controller is a person or group of persons responsible for monitoring material availability. The MRP controller forecasts sales and production schedules in order to establish what requirements must be met in order to meet the needs of the buyer. They find out the potential problems related to production and create new parameters and guidelines. An MRP controller has the ability to foresee and correct any problems that might impact production requirements.

II. LITERATURE REVIEW

A significant part of the recent literature on supply chain system explores the decisions on controlling inventory, production and distribution.

The article "Inventory Reduction: The Fundamental Techniques" written by "Mike Rauch" Published in "Professional Door Dealer" magazine, states that "The most effective way for businesses to reduce inventory is by reducing the supply lead time. Lead time can be defined as the time it takes from when you first determine a need for a product until it arrives on your doorstep. If lead time was zero, inventory could be zero".

Marvin B. Lieberman and Lieven Demeester explains in the article "Inventory Reduction and Productivity Growth: Evidence from the Japanese Automotive Sector" that "on average, each 10% reduction in inventory led to about a 1% gain in labour productivity, with a lag of about one year"(published on 9th May, 1995, page no. 2,)

The topic "Supply Chain Management: Literature Review And Some Issues" written by "Jinesh Jain", published in "Journal Of Studies On Manufacturing, (Vol-1-2010/Iss.1)", Jan, 2010 emphasises that "In the current competitive scenario supply chain management assumes a significant importance and calls for serious research attention, as companies are challenged with finding ways to meet ever-rising customer expectations at a manageable cost. To do so, businesses must search out which parts of their supply-chain process are not competitive, understand which customer needs are not being met, establish improvement goals, and rapidly implement necessary improvements"

Inventory Management is important part of logistics, given its significant impact on firm and supply chain performance. Firm recognize Inventory Management as important driver of firm performance & undertake initiatives to improve inventory management efficiency and effectiveness says Cuneyt Eroger & Christian Hofer in the paper "Inventory Types & Firms Performance; Vector Autoregressive & Vector Error Correction Models" .

III. NEED OF THE STUDY

In L&T, Inventory management forecasts and make strategies which help in minimizing inventory costs because goods are created or received as inventory only when needed. As the MRP controller is not the actual buyer of the material, the handover form is filled by the MRP controller so that the material is handed over to the actual buyer. Hence the cost of the material gets transferred. It was found out that STRATEGIC SOURCING GROUP DEPARTMENT was carrying 3.69 crore inventory (factious) on its name.

There was difference between the physical stock and the stock shown in the system. Because of this problem, the procurer always faced problem regarding excess stock and excess shortages. And because of excess shortages, the production line remained dry. Hence, proving loss to the company as a whole. As there had excess shortages, the supplier was always under pressure. They had to supply large quantity in short period. Hence few suppliers were not satisfied with the process. So relation between the suppliers and L&T was bad.

IV. OBJECTIVES OF THE PROJECT

After identifying the problems faced by L&T, the researcher has finalised the following objectives;

i. To check wrongly stocked items and perform BOM purification for accurate planning of the material.
ii. To correct the data in the system after BOM purification.
iii. To reduce factious inventory cost on STRATEGIC SOURCING GROUP department head.
iv. To solve the grievances of the suppliers.

V. SCOPE OF THE STUDY

This research will help the L&T, the employees and the researcher in the broader sense. Scope of the study is spread in three aspects:

As the BOM of the items gets corrected in the system; there will be accurate procurement and planning of the material**.** Filling up of handover forms by the MRP controller, factious inventory cost on SSG department head gets reduced gradually. Cordial relationship maintained between L&T and the suppliers by issuing of Standard Operating Procedures for the Suppliers for smooth functioning.

It has helped the researchers to Study and understand the concepts of inventory management, BOM purification, SAP software and how procurement of material is done.

VI. LIMITATIONS

- Employees working in L&T from last 10 years showed lethargic approach towards CHANGE.
- The study is limited to scope of data publicly available.
- The researchers could not get enough time to work upon other processes and automation of procurement.

VII. RESEARCH DESIGN AND METHODOLOGY:

7.1 Research Design:

In this project reduction of factious inventory cost and accurate planning of LARSEN AND TOUBRO has been analysed. An attempt is also made to try to solve the problems faced by suppliers while delivery of the material to L&T.

7.2 Collection of Data:

I. Reduction of the factious inventory cost and accurate planning of the material.

Two methods are used; BOM purification and MRP controller transfer.

A. BOM Purification:

To purify the bill of material, the first process was checking of physical stock.

- Physically the stock of few items was checked.
- If the number of physically checked items is equal to the number shown in the system, which means the BOM is already purified.
- But there is huge difference.

B. MRP Controller Transfer:

The MRP controller is not the actual buyer of the material. So after the material is delivered by the supplier, the handover form is filled by the MRP controller so that the actual buyer is responsible for the delivered material. Hence the cost of the material gets transferred.

II. Standard operating procedures for the suppliers to solve their grievance.

For hardware L&T deals with 11 suppliers. Questionnaire is made for 7 suppliers.

7.3 DATA PRESENTATION, ANALYSISAND INTREPRETATION:

7.3.1 Data Analysis:

I. Reduction of the factious inventory cost and accurate planning of the material.

A. BOM PURIFICATION:-

For example: **Cat no: XN00025** BIN WEIGHT: 1 KG FOR 50 NUMBERS WEIGHT: 0.032 kg For 50 numbers = .032 wt For X numbers = 57.15wt	Therefore; **X numbers = (57.15*50)/0.032** Therefore **X numbers =89296.87** **And in SYSTEM the value of X =288769** **Hence error.**

DETAILS AND STEPS INVOLVED IN BOM PURIFICATION

1. In SAP to find out where to the cat no. is used. We fire CS15.
2. Download the data from the system.
3. Physically check where that cat no. is used.
4. Data from the system and data from physically checking are compared.
5. The result is 'mismatch'.
6. Hence BOM IS CORRECTED.
7. BOM is corrected in the SAP system by firing CS02.

B. MRP CONTROLLER TRANSFER:-

ON 24TH JUNE

		SUMMARY			
	Cpower AND 1556	U power	MCCB	SSG	Total
Existing	164	30.8	0.6	130	325.4
H/o done	7.86	3.79	0	6.86	18.51

Table 2 : 24th June inventory data

ON 4TH OF JULY

		SUMMARY			
	Cpower AND 1556	U power	MCCB	SSG	Total
Existing	164	30.8	0.6	130	325.4
H/o done	7.86	29.5	0.6	6.86	44.82
LEFT	156.1	1.3	0	123.1	280.58

Table 3: 4th July Inventory data

Till date amount 44.82 lakhs have been transferred from SSG department.

II. Questionnaire For The Suppliers:

11 questions were asked to the suppliers. Out of which only few are mentioned.

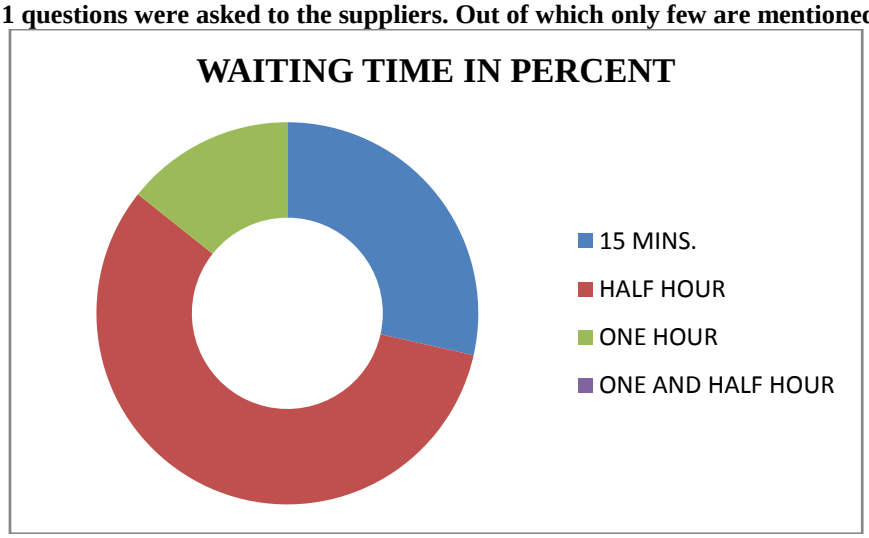


Figure 2 : Waiting time of supplier

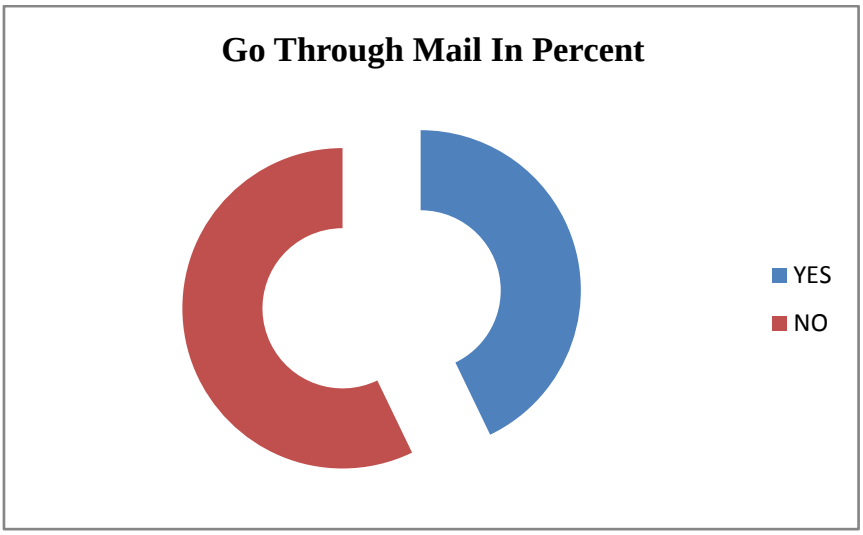


Figure 3: communication method used by supplier

So six golden rules are suggested by the researcher.

1. The supplier must study the mail sent by L & T every month as a schedule
2. The supplier has to study the mails sent from L & T.
3. The supplier must give priority to supply part nos having schedules with 2SDQ.
4. The supplier has to ensure challan parking or inbound to make. always deliver the same quantity as given in the schedule. They should not come with delivery of material without challan parking.
5. The supplier should inform the concerned authority while leaving premises so that gate pass is issued, hence taking care of their precious time.
6. The supplier who is not self certified must submit reports so that the parts delivered by them are stuck in quality issues.
7. L&T will be Monitoring supplier's performance schedules Vs dispatch which will have direct impact on supplier's vendor rating & SOB (SHARE OF BUSINESS).

III. Analysis of Automation Of Hardware:

Sr. No	EXISTING PROCESS	PROPOSED PROCESS
1.	STOCK has been calculated of each item from SAP and entered in planning sheet on 1st day of every month	To be done automatically in SAP
2.	AVG. consumption of last 3 months has been calculated from SAP and entered in planning sheet on 1st day of every month.	To be done automatically in SAP
3.	Based on stock and avg. consumption of each item, order in terms of SDQ has been decided manually.	To be done automatically in SAP
4.	Purchase order of parts has been created on individual parts.	To be done automatically in SAP
5.	source list maintained of individual item as per the purchase order	To be done automatically in SAP
6.	Schedules has been put as per SDQ	To be done automatically in SAP
7.	Mail communication has been sent to all concern suppliers	Mail communication has been sent to all concern suppliers
8.	Weekly cross checking of receipts of material with respect to schedules given	Weekly cross checking of receipts of material with respect to schedules given

VIII. FINDINGS

1. Manual procurement of hardware needs maximum manual intervention, man hours and calls for some errors. This results in shortages of material or excess inventory.
2. There is excess of stock and excess of shortages of the material because of incorrect bill of material.
3. There is factious inventory cost on strategic sourcing department because of no steps taken to change the name of MRP controller to the present buyer. SSG department carrying factious 3.69 cr. inventory cost.
4. As there are excess shortages of the material and the production line becomes dry. Hence, effecting the production department.
5. The suppliers are brought under hammer for urgent procurement. Hence, increasing the grievances of the suppliers.
6. The physical stock of the material was not matching with the SAP stock.
7. The procurer couldn't do the accurate planning of the material because of errors in the system.

IX. SUGGESTIONS

1. As manual procurement of hardware needs maximum man hours and calls for some errors, the researcher suggests automation of procurement of the hardware.
2. Hand over forms regarding MRP controller transfer should be done timely so that factious inventory cost is not on strategic sourcing department.
3. There should be regular check of the stock physically and if errors identified, timely action should be taken.
4. Grievances of the suppliers should be resolved for better relations and functioning of L&T and suppliers. So six golden rules are suggested by the researcher. Let's pick up the pace in the process of procurement-to- pay for goods delivered. Hence beneficial to the supplier for the smooth functioning. To pick up the pace in the process of procurement- to- pay for goods delivered, let's go through the bellow mentioned standard operating procedure;

X. CONCLUSION

This research work concludes that inventory has two sides; possessing a high amount of inventory for long periods of time is not usually good for a business because of inventory storage, obsolescence, spoilage costs. The physical stock of the material was not matching with the SAP stock. The reason was incorrect BOM. Moreover, SSG department was carrying the factious inventory stock of 3.69 cr. The reason was that the MRP controller didn't transfer the material to the actual buyer. The researcher made an attempt to purify the incorrect BOM; and is successful to some extent. The researcher also made an attempt to clear out the factious inventory cost on SSG department head. 44.82 lakhs have been transferred from SSG department. The researcher also tried to solve the problems of the suppliers by designing of SIX GOLDEN RULES for smooth functioning.

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