PREVENTION OF PROBLEM OCCURRENCES FOR REDUCING RAW MATERIAL INVENTORY

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ABSTRACT:

The Main aim of this project to reduce the raw material inventory carrying less than 30 days. Some major problems lead to inventory carrying more 30 days as bulk buying of raw materials, purchasing of raw material in advance, holding non-moving raw materials and greater number of raw material rejections due to an unskilled labour led to delay in supply of raw material to the external and internal customer. The detailed study focuses on generating expert ideas and how to overcome the problems in order to satisfy the customer and improving the productivity of the organization. Pareto analysis has been applied and changes were done in few process standards for reducing the raw material inventory from 45 days to 30 days. This issue has been categorized based the level of importance and customer expectations and to increase in productivity of an organization. As a result, raw material inventory carrying has been reduced from 45 days to 30 days.

Keywords: Inventory, Prevention, Raw material, carrying cost, quality specifications, on time delivery and performance.

Introduction

Raw Materials Inventory can assume a significant part in working on the efficiency of the manpower in the working unit. On the off chance that the natural substance stock is arranged appropriately, laborers will not have a lot of inactive free time. This will make them undeniably more useful. Effective materials help executives in the decrease of wastages that is related with numerous creation units. Getting more raw materials or less are both unwanted from an organization's stance. The equivalent ought to be simply exact and satisfactory. One of the significant benefits of Raw material inventory is working on the funds and books of a business. Viable materials the board can assume a significant part in working on predictive analysis and predicting of stock inflow and outflow. In conclusion executives can help in further developing creation and conveyance times in legitimate materials. At the end of the day, it can help in smoothing out every one of the different cycles that are experienced inside the creation interaction. The entrepreneur may be investing more energy than any other time in recent memory dealing with their raw material inventory, with little to show for it. More unrefined components stack up, apparently enough to keep going for any unanticipated event. This expands your inventory expenditure on monetary record.

RESEARCH OBJECTIVES:

- To reduce the raw material inventory carrying less than 30 days and to enhance profitability of an organisation by preventing problem occurrences.
- To meet on time delivery of raw materials needs to be in correct dimensions as per quality specifications to internal customers and finished goods to external customer.
- To ensure supply of finished goods in right quality to customers and get 100% good performance report.

Theoretical and Empirical Background

EA Silver, N Zufferey Most inventory modelling has accepted stochastic requests and steady lead times. deficiencies of natural substances bring about lost deals. The point is to propose heuristic strategies for limiting the normal expenses in such circumstances. **RJ Tersine (1988)** examinations a specially make to order inventory framework. Dynamic programming is utilized to foster a calculation for figuring the ideal recharging strategy and the normal complete stock expense per item. Mathematical investigation is completed and the outcomes show that data utilized in inventory control can reduce the total inventory cost fundamentally. **Kyung.S.Park** - a creation inventory model is introduced which binds together the stock issue of the completed item and decaying natural substances for a solitary item creation framework. The deterioration of the raw material is thought to be a steady part of the inventory. **Capkun et al. (2009)** analyse the connection among inventory and execution of American based assembling firms, their discoveries demonstrate ran material inventory, WIPI and FGI essentially impacted

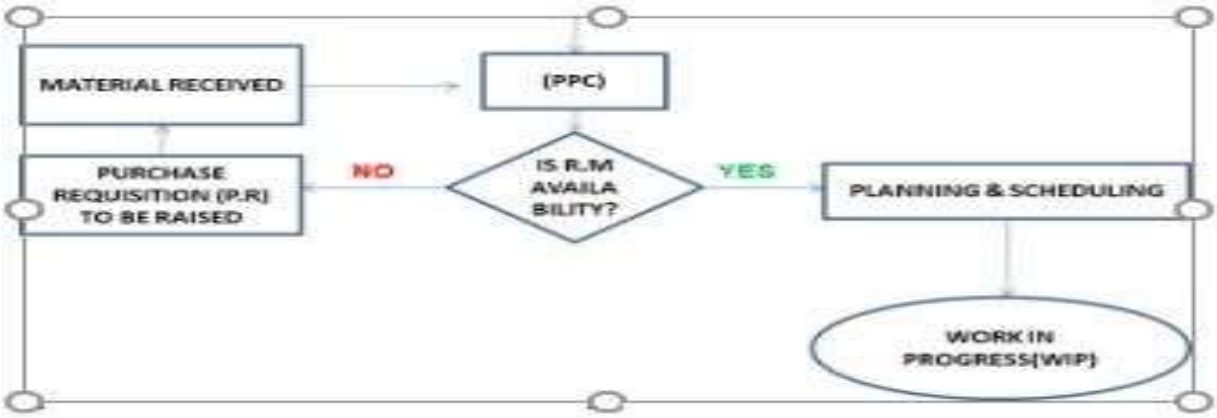
execution of firms in the assembling ventures. However, their impact differs yet Raw Material Inventory has the most essential effect on firm execution surrogate by overall revenues and income before interest and tax. **Bernard and Noel (1991)** look at whether stock revelation anticipate deals and income by dividing inventories into RMI, WIPI and FGI. They observed distinctive critical outcomes among the stock sorts. This means that RMI, WIPI and FGI are distinctive efficiently dependent on their determinants and effect on functional and monetary execution. **Kros, Falasca and Nadler, (2006)** Raw materials are part portions of inventories conveyed by an assembling firm at a given time. Each association has inventories of some kind of financial aspects and procedures of stock administration are basics of productive activity, benefit and endurance particularly in an exceptionally serious climate. **Eneje et al (2012)** Investigated the impacts of raw material inventory management on the productivity of distillery firms in Nigeria utilizing a cross sectional information from 1989 to 2008 which was assembled for the examination from the yearly reports of the inspected brewery firms. They inferred that productive administration of raw material inventory is a central point to be contained with by Nigerian brewers in improving or supporting their benefit. **Goyal (1977)** considered a stock model that bound together the stock issue of unrefined substance and completed items for a solitary item fabricating framework. He called attention to that the issue of deciding the ideal acquirement strategy for unrefined substance can't be treated in detachment; it relies upon the creation clump size of the items that necessary the raw material. **Sarker and Parija (1996)** fostered a requesting strategy for natural substance for a solitary assembling cluster. The goal was to limit the complete expense while simultaneously satisfying the need of the creation office. Utilizing a whole number estimate, they had the option to arrive at the ideal arrangement.

RESEARCH METHODOLOGY:

The data of raw material inventory has been captured from the company of production planning and control department. The Raw material inventory carrying is more than 30 days This is main reason for delay and supply in supply not meeting customer expectations so we need to reduce raw material inventory to 30 days. The Percentage analysis has been used to control raw material inventory and Pareto analysis has been applied to understand the 20% because that leads to 80% delay of supply. The facts and figures have been grouped through interaction with the Executives working in the unit. The data were collected from monthly production details, quality rejection details and raw material details through invoice from an internal and external agents and customer. Inventory carrying data for more than 30 days taken for the year between 2020 to 2021.production of coils into sheets have been taken into account for this study. Material inward and invoice details have been taken as primary data, expert opinions, opinion from executives and management information have been gathered for secondary data.

DATA ANALYSIS AND INTERPRETATION:

EXISTING PROCESS FLOW CHART FOR RAW MATERIAL INVENTORY AS ON 23.07.2021



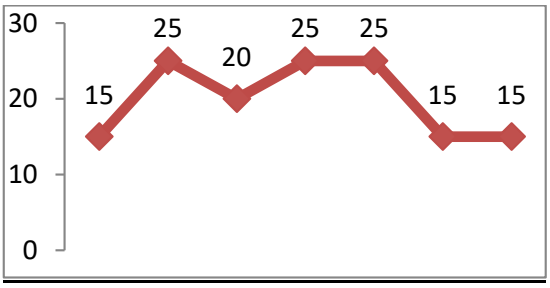
CUSTOMER'S EXPECTATION

Customers	EXPECTATION'S		
	What is expected? (Describe)	Measure (Parameter)	What is expected? (Describe)
Internal Customers			
Production	R.aw Material supply	On time	100%
Quality	Right Raw Material	Qlty. Specifications	100%
Marketing	Finished Goods Delivery	As per schedule	100%
Management			
Management	Customer satisfaction	Customer feed back	100%
	Inventory Carrying	Number of Days	< 30
External Customer			
Every Customer	Right Quality & on time delivery	As per Performance report from customer	100%

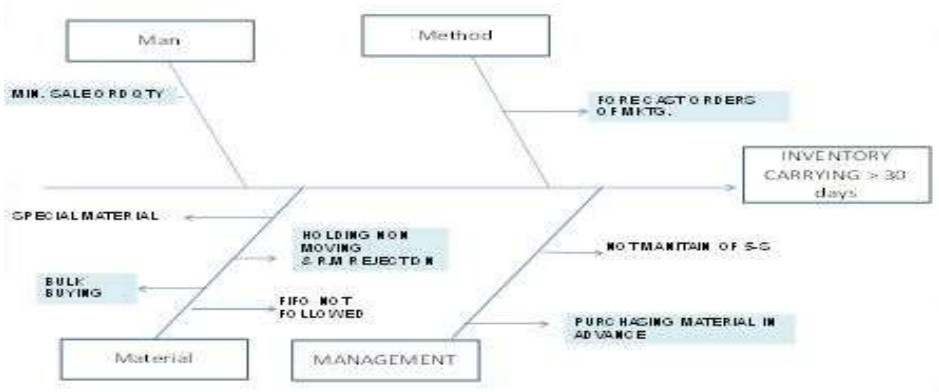
DATA COLLECTION SHEET

Customers Expectation	Deviation from expectations	Problems Occurrence by month							
	Problems	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Total
R.M supply on time	Delay in supply	25	30	23	15	18	21	20	152
Right R.M	Not meeting quality spec	0	2	1	0	2	0	1	6
Finished Goods Delivery	Not meeting the scheduled qty	3	4	7	3	2	0	5	24
Customer satisfaction	Not satisfied 100%	1	2	1	3	2	3	4	16
Inventory Carrying	More than 30 days	15	25	20	25	25	15	15	140

RUN CHART FOR INVENTORY CARRYING > 30 DAYS



POTENTIAL CAUSES FOR INVENTORY CARRYING > 30 DAYS



IDENTIFYING ROOT CAUSES

LIKELY CAUSES	PROBLEM OCCURENCES BY MONTH							
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Total
	15	25	20	25	25	15	15	
Bulk Buying	X	X	X	X	X			5
Minimum Sale Order Qty		X		X	X			3
Holding non moving &R.M rejection	X	X	X	X	X	X	X	7
Material Purchasing in Advance			X	X	X			3
Forecast of orders from mktg.		X	X	X	X			4

From the data sheet it is clearly stated that the customer expectation on raw material supply on time, gets deviated from their expectations as such as delay in supply. Problem occurrence in every month shows that delay in supply, not meeting quality specifications, not meeting the scheduled quantity, expectations are not fulfilled completely and inventory carrying mor than 30 days. Root causes of the problem occurrences were identified properly in order to rectify the issues and make the raw material inventory carrying less than 30 days. It is identified that bulk buying, minimum sale order quantity, Holding non moving & raw material rejection, Material purchase in advance and forecast of orders from marketing are the major causes of the problem.

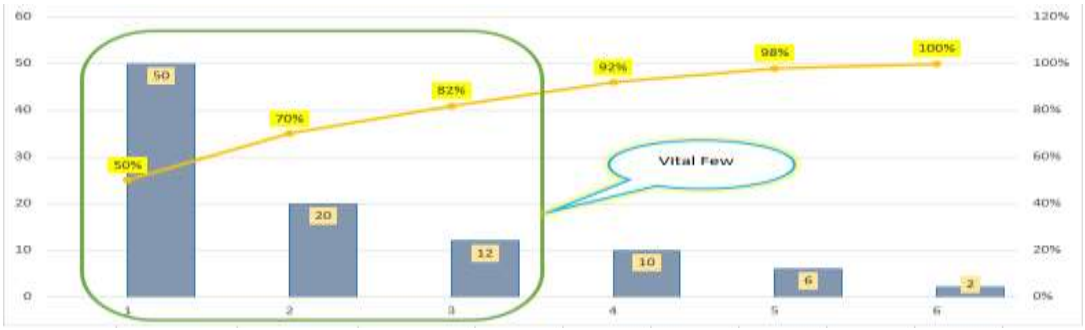
Tools and Interpretation

PARETO ANALYSIS

Here we considered monthly inflow of unfinished raw material (Coils) data of items and applied Pareto analysis as what are the reasons of rejection and delays till we get finished Material (Sheets).

4 Months data (Aug 21 to Nov 21)

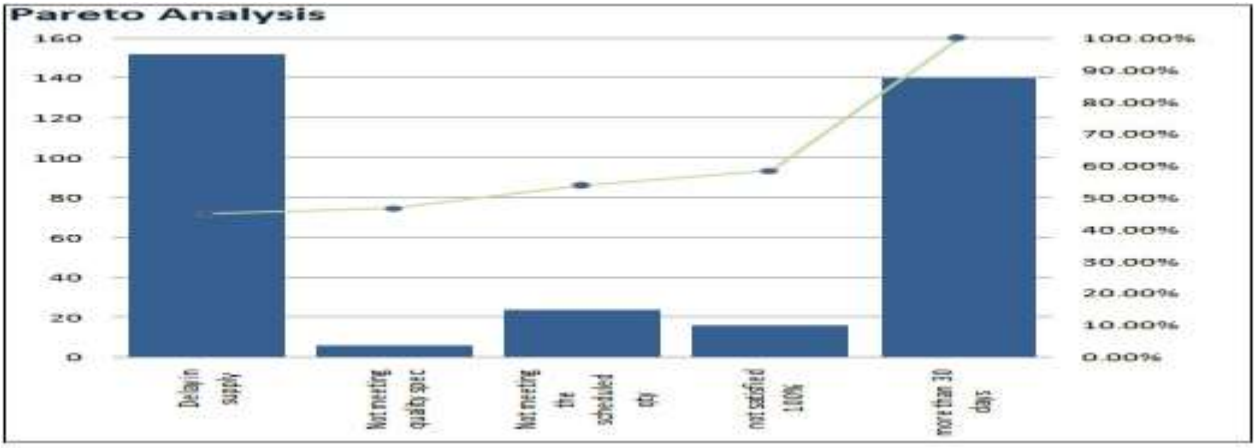
S. No	Delay reasons	Frequency	Cumulative Freq.	Cumulative %
1	Dimension error of finished raw material	50	50	50%
2	Short shipment of raw material	20	70	70%
3	Labour shortage	12	82	82%
4	Skillet issue for making finished raw material	10	92	92%
5	Improper documentation	6	98	98%
6	Plant shutdown/Union strike or other delay	2	100	100%



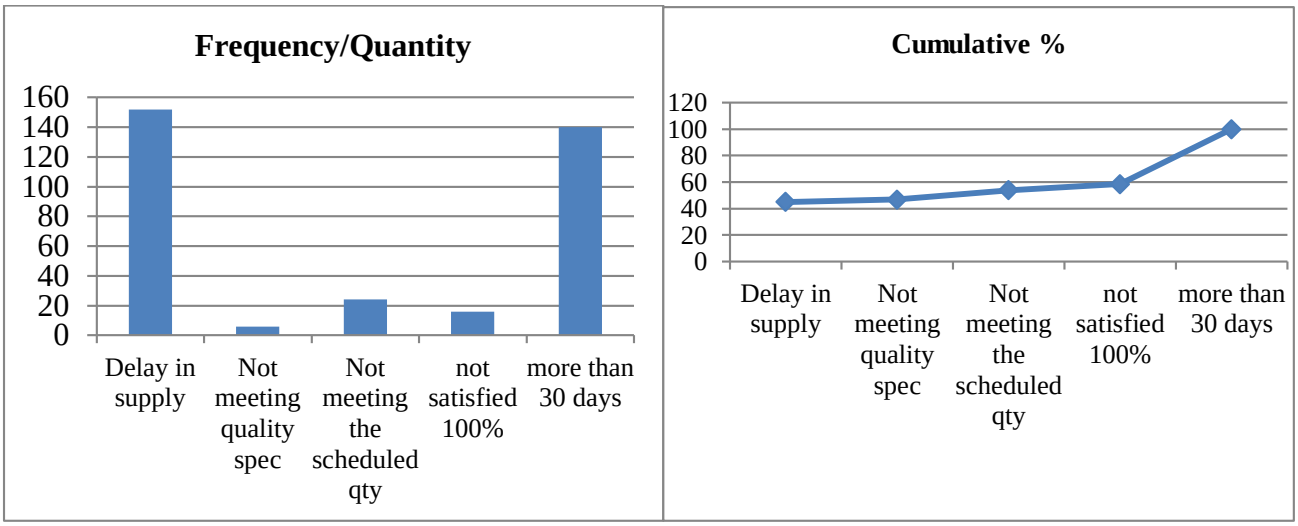
PROBLEMS OCCURRENCES BY VARIOUS CATEGORIES

Category	Frequency/Quantity	Cumulative %
Delay in supply	152	44.97
Not meeting quality specifications	6	46.75
Not meeting the scheduled quantity	24	53.85
Not satisfied 100%	16	58.58
More than 30 days	140	100
Total	338	

PARETO ANALYSIS FOR THE TYPE OF PROBLEMS



FREQUENCY AND QUANTITY CHART **CUMULATIVE CHART FOR PARETO ANALYSIS**



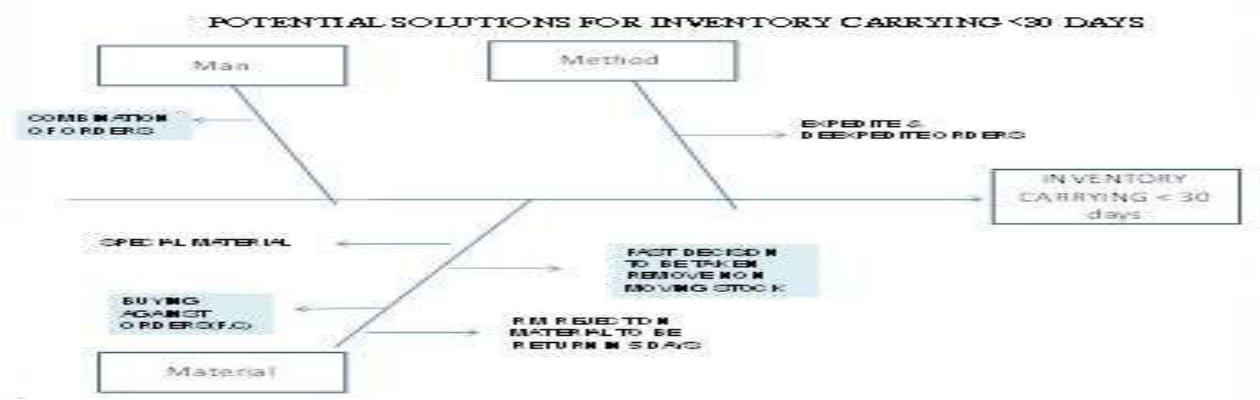
PARETO ANALYSIS INTERPRETATION

Based on the Pareto Analysis principal of 80/20 of 80/20 rule, we could able to process the sample data of last four months and observed the Vital Few.

20% of Total causes observed as the main factor that leads to 80% of delay and rejection of raw materials into finished materials (sheets).

Hence the organization need to focus on close monitoring on these 20% main factors and applying strategies to reduce the inventory of unfinished materials from 50 items per month to 45-40 items per month as a first action.

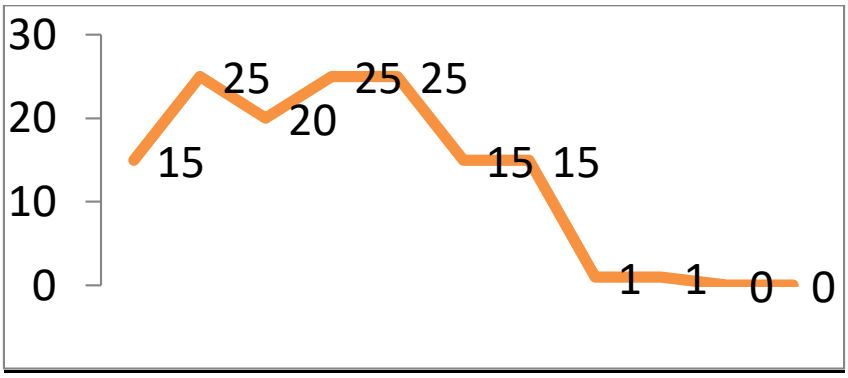
POTENTIAL CAUSES FOR INVENTORY CARRYING < 30 DAYS



DATA COLLECTION SHEET AFTER IMPLEMENTATION

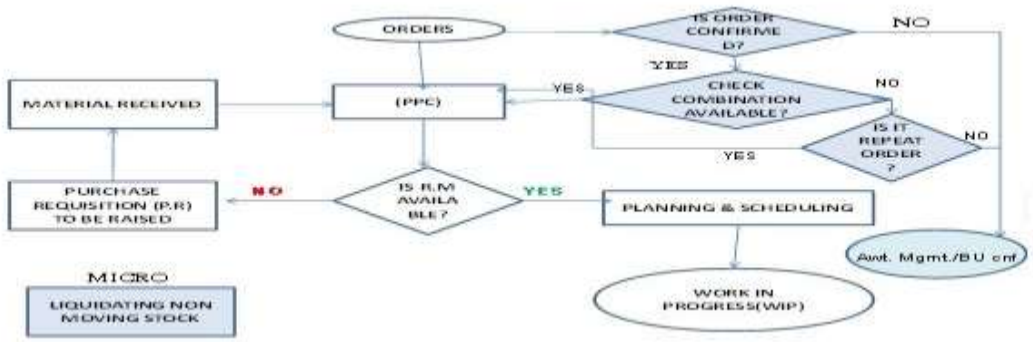
Customers Expectation	Deviation from Expectation	Problems Occurrences by Months										
	Problems	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
R.M Supply on time	Delay in supply	25	30	23	15	18	21	20	5	4	3	3
Right R.M	Not meeting quality spec	0	2	1	0	2	0	1	0	0	0	0
FG Delivery	Not meeting scheduled qty	3	4	7	3	2	0	5	1	1	1	1
Customer satisfaction	Not satisfied 100%	1	2	1	3	2	3	4	1	1	1	1
Inventory Carrying	More than 30 days	15	25	20	25	25	15	15	1	1	0	0

RUN CHART FOR INVENTORY CARRYING < 30 DAYS



MODIFIED PROCESS FLOW CHART FOR RAW MATERIAL INVENTORY

AS ON 24.11.2021



SUMMARY OF ACTION TAKEN

ROOT CAUSE	ACTIONS TAKEN	COMPLETED ON DATE
BULK BUYING	BUYING AGAINST ORDERS (FORE CASTING)	30/09/2021
MINIMUN SALE ORDER QTY.	COMBINATION OF ORDERS	28/10/2021
HOLDING OF NON-MOVING & R.M REJECTION	FAST DECISION TAKEN TO REMOVE NON-MOVING STOCK	20/11/2021

FINDINGS OF STUDY:

DESIRED RESULT: Reduced the Raw Material Inventory from 45 days to 30 days
Process to be worked on: To reduce R.M Inventory by changing process standard.
Project Starting Date : 23/07/2021
Estimated Completion Date : 20/11/2021
Meeting Frequency : Once in a Week

The problem occurred month by month such as delay in supply of raw material for internal customer and delay in supply of finished goods for external customer its leads to impact in inventory carrying more than 30 days. The internal quality rejection such as the finished material not meeting the quality specifications as per dimensions it's also one of the reasons for inventory carrying more than 30 days. The research shows that even it will affect the scheduled quantity of production. The holdings of non-moving material and rejection material it's leads to inventory carrying more than 30 days. The bulk buying of raw materials is also affect the inventory control. The buying of raw materials without the conformation of orders it's leads to holding of non-moving material. The not checking of combination of orders its leads to impact in wastage of material. Hence, we find that delay in supply will leads to inventory carrying more than 30 days. Pareto analysis has been applied and changes were done in few process standards for reducing the raw material inventory from 45 days-30 days. This issue has been categorized based the level of importance and customer expectations and to increase in productivity of an organization. As a result, raw material inventory carrying has been reduced from 45 days to 30 days.

SUGGESTIONS:

Organization should go to lengths for support of legitimate stores and extras in order to stay away from the regular breakdown of the machinery. There is a need to foster great correspondence framework between different offices like Marketing, planning, procurement, production and distribution capacities. The organization ought to follow Just-in-Time procedure, in this way it can get rid of sitting tight an ideal opportunity for a receipt of materials. To control the raw material inventory carrying less than 30 days need to reduce the bulk buying of raw materials and need to buy raw materials as per orders quantity. Before buying of raw materials need to check whether there is a combination of raw materials which suits the order quantity. Need to take a quick decision to move holdings of non-moving material and rejection material as soon as possible. Need to reduce the internal rejection of raw materials by quality which the materials are not in correct dimensions. Need to check whether the order is confirmed then

need to buy the raw materials. The insufficient Labour will lead to decrease in productivity. Thus, the Labours without proper training in operating of machines will leads to increase in more rejection. If the organisation acts on the above-mentioned issues can able to reduce the raw material inventory carrying less than 30 days.

CONCLUSION:

Raw material inventory has to do with keeping careful records of finished items that are ready for shipment. This regularly infers posting the creation of as of late completed finished goods to the stock totals similarly as removing the most recent shipments of finished items to buyers. Exactly when the association has a product trade set up, there is normally a sub-class contained in the finished goods stock to address any returned items that are renamed or second grade quality. Exactly staying aware of figures on the finished product stock makes it possible to quickly give information to bargains staff in regards to what is open and ready for shipment at some irregular time. Raw material inventory is huge for limiting costs, while meeting rule. Market interest are a touchy balance, and stock longings to ensure that the harmony is undisturbed. Extraordinarily pre-arranged Inventory the leaders and first-rate programming will help make with inspecting the board a victory. The ROI of Inventory the chiefs will be found in the sorts of extended pay and advantages, positive agent environment, and on for the most part addition of customer reliability and loyalty. Thus, the association need to zero in on close observing on these 20% principal factors and applying systems to lessen the stock of incomplete materials from 50 items per month to 45-40 items each month as a first activity.

APPENDICES:

S. No	Delay reasons	Frequency	Cumulative Freq.	Cumulative %
1	Dimension error of finished raw material	50	50	50%
2	Short shipment of raw material	20	70	70%
3	Labour shortage	12	82	82%
4	Skillet issue for making finished raw material	10	92	92%
5	Improper documentation	6	98	98%
6	Plant shutdown/Union strike or other delay	2	100	100%
	Total	100		

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