Original Research Article

Lead Time Reduction of Inbound Logistics in a FMCG Company

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Abstract: Fast Moving Consumer Goods(FMCG) by the name has high demand in the market as well as heavy competition. Maximizing efficiency and effectiveness of the process in the industry by shrinking supply chain and making dynamic production to meet unpredictable demand is a challenging task faced by the industry. Logistics which is a major portion of supply chain, adds cost to product without adding value is a major area to focus, as customer is not willing to pay for it. In this case study we have considered a process industry which consumes COPRA and extracts Edible oil from it. A portion of supply chain which deals with IN-BOUND LOGISTICS is taken for improvement. The Aim of the study is to reduce the inbound Truck Turn Around Time (TTAT) by 70% with minimal cost. Presently the company has loss of Rs. 11.5Lakhs per month on average by paying the truck owners for delaying truck for more than a day. Since the demand is increasing rapidly the company has decided to double the productivity. Through this study scope of improvement is found by analysing detailed time study. Mistake proofing and standardization of work is also done to reduce the variation and improve the mean TTAT.
Keywords: Inbound logistics, TTAT, Time Study, FMCG, Process Industry, Lead time reduction

INTRODUCTION

Fast-moving consumer goods (FMCG) or consumer packaged goods (CPG) are products that are sold quickly and at relatively low cost. Examples include non-durable goods such as soft drinks, toiletries, over-the-counter drugs, processed foods and many other consumables. In contrast, durable goods or major appliances such as kitchen appliances are generally replaced over a period of several years[1]. Though the profit margin made on FMCG products is relatively small (more so for retailers than the producers/suppliers), they are generally sold in large quantities; thus, the cumulative profit on such products can be substantial. FMCG is a classic case of low margin and high volume business. Thus, maximizing efficiency and effectiveness of the process in the industry by shrinking supply chain and making dynamic production to meet unpredictable demand is a challenging task faced by any industry[2,3].

The following are the main characteristics of FMCGs
From the consumers' perspective
- Frequent purchase

- Low involvement (little or no effort to choose the item)
- Low price
- Short shelf life
- Must use for daily consumption

From the marketers' angle
- High volumes
- Low contribution margins
- Extensive distribution networks
- High stock turnover

Logistics is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations[4]. The resources managed in logistics can include physical items such as food, materials, animals, equipment, and liquids; as well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transportation,

warehousing, and often security. Logistics is a major portion of supply chain, adds cost to product without adding value is a major area to focus, as customer is may not know the amount they pay for it. The challenges of the logistics and supply chain operation is concerned with the "FIVE V's" Value, Velocity, Variability, Visibility and Vulnerability.

Inbound and Outbound Logistics

Inbound logistics refers to the transport, storage and delivery of goods coming into a business. Outbound logistics refers to the same for goods going out of a business. Inbound and outbound logistics combine within the field of supply-chain management, as managers seek to maximize the reliability and efficiency of distribution networks while minimizing transport and storage costs. Understanding the differences and correlation between inbound and outbound logistics can provide insight for developing a comprehensive supply-chain management strategy.

LITERATURE REVIEW

Truck Turnaround Time [5]: The In-plant logistics system that was practised and was influenced by the organisation of facilities like security gate, weighbridge, layout of loading bay and warehouse occupancy, and procedures followed within the company. The understanding andco-operation of truck operators and contractors in doing business with the industry also played an important role in adopting and streamlining this process. The result of all these components was the time a truck spent in the system. This single measure not only evaluated the total performance of in-plant logistics function, but also provided an opportunity to quantify performance improvement as and when they were planned and implemented. In order to appreciate this measurement, collected data on truck arrival and departure statistics for a span of 30 days and conducted some analysis. Fig. 1 Shows the schematic representation of the flow of process. There was no specific reason for selecting this time period and this period was considered to be representative. This data was organised as follows: Entry gate time to warehouse reporting time; Loading time at the warehouse; Exit gate time from entry gate reporting time.
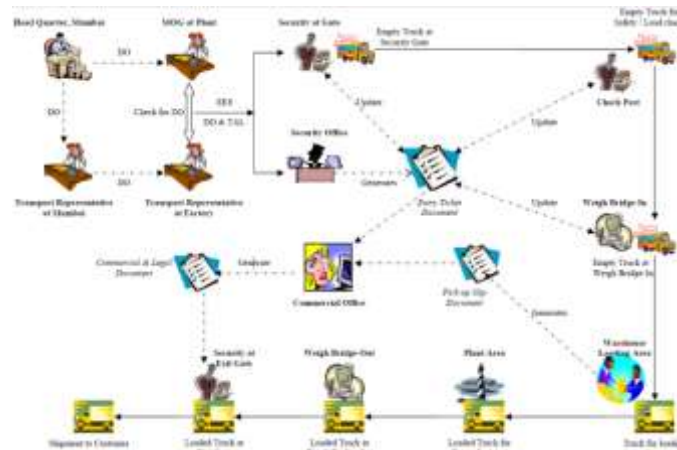

Fig-1: Schematic Representation of Flow of work

PROBLEM DEFINITION

In this case study, we have considered a process industry which consumes COPRA and extracts Edible oil from it. A portion of supply chain which deals with IN-BOUND LOGISTICS is taken for improvement. The Aim of the study is to reduce the inbound Truck Turn Around Time (TTAT) by 70% with minimal cost

Through this study also 50% of the Trucks arriving the plant are delayed by a day (Some even more). Expected Number of trucks per month 320 in which 160 trucks are payed 600Rs for delay Loss of Rs96000 (June 2016 data) so approx. loss per year is Rs11,52,000. Make this to ZERO.
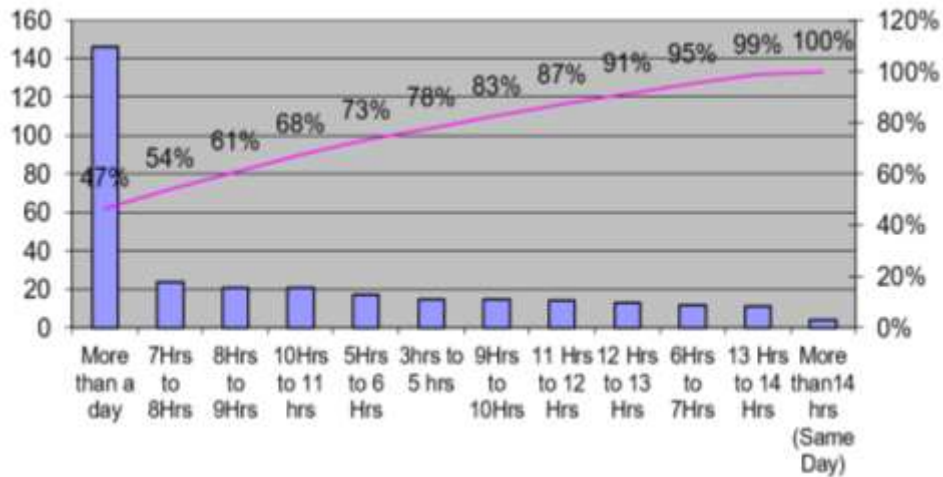
Fig-2: Pareto Chart showing different TTAT and number of trucks

Current status of in-bound logistics from 12-15 Trucks per day is doubled without increasing the number of labours, reducing the Cost of Delay and simplifying the process with a small increase in working time of 10-15% Productivity is doubled with 10-15% increase in labour expense
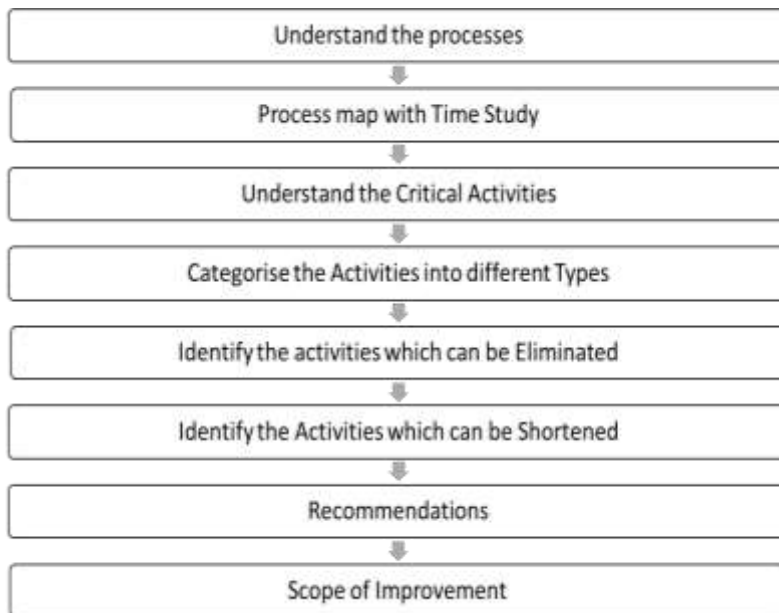
Reduction of TTAT for inbound Logistics in a Food Processing Industry-
Average Turn Around Time = 8 Hrs 51 Minutes

Minimum Turn Around Time = 3 Hrs
Entitlement (Avg.-Min.) = 5 Hrs 51 Minutes
Expected to improve 70%,

Therefore, the Target Turn Around Time = 4 Hrs and 5 Minutes

As the demand is increasing rapidly the company has decided to double the productivity.

METHODOLOGY

The foremost step is to understand the process properly. Process Map is done in micro level with detailed time study. The activities are then classified into different types. Critical activities are then sorted separated. Time study is done 3 times in order to get the average value. The mean time is then calculated. Pareto chart is done in order to analyse the area of focus. Activities which can be eliminated and activities that

can be removed are found. Recommended suggestions for process improvement and lead time reduction by process elimination and process modification in then

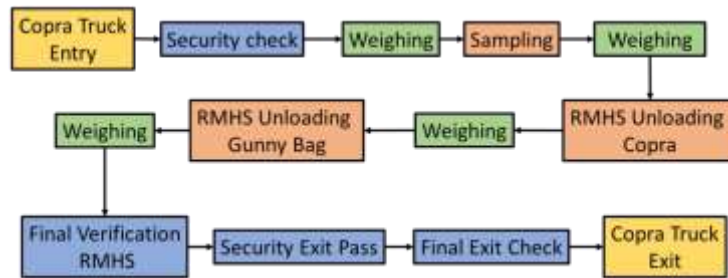found. Scope of Improvement is also given for further improvements.

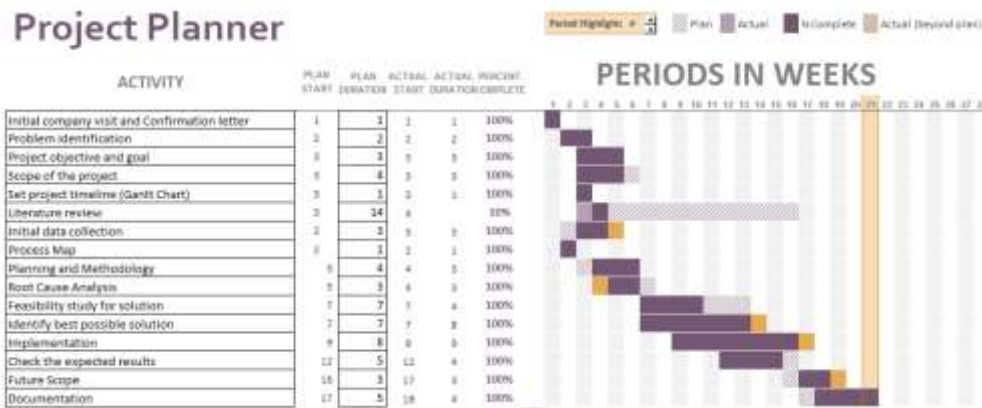**Fig-3: Flow Chart of the current state process**

Fig-4: Gantt Chart: A project Management Tool for scheduling process

The project Timeline or Gantt Chart is built with the help if project management tool. Different steps and the planned start and duration is first noted. The timeline is given in weeks and project total duration is 21 Weeks. The Actual duration is also entered in order to understand the running status.

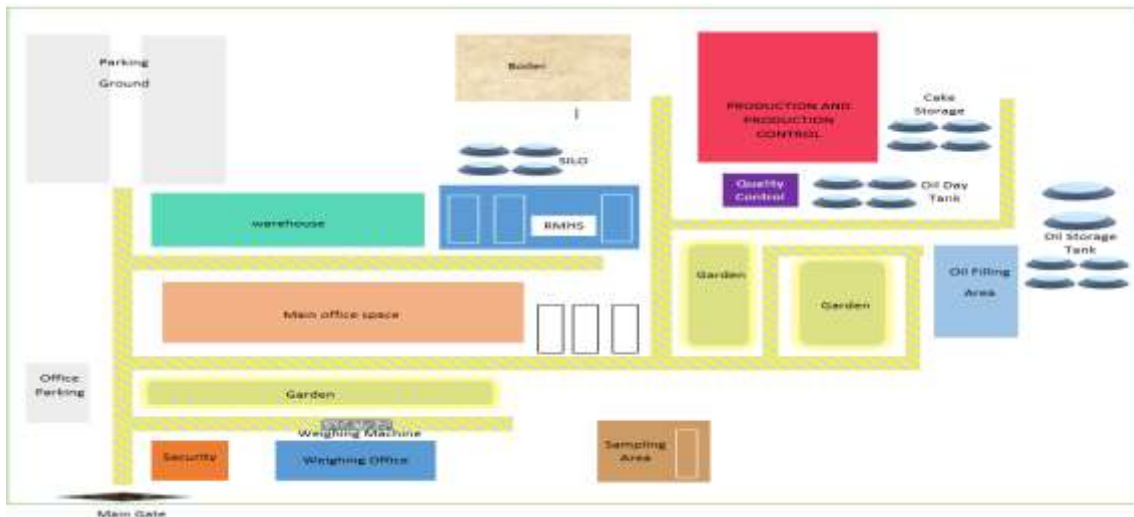Then understanding the process in a detailed way by plotting the plant layout and flow of operation is done.

Fig-5: Plant Layout

Inbound Logistics Process
- Truck coming to plant
- Checking the Quality & Quantity of copra
- Unloading the Copra in Warehouse/silo
- Truck Leaving the Plant.

Detailed time study in micro-level is done and also distance travelled is measured. Time study is done
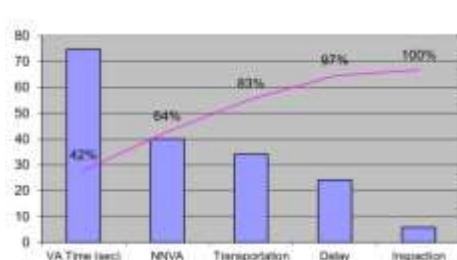
multiple times to check the correctness of the value and variation in the data. The mean time is taken for plotting the Pareto charts.

The time study data is categorised into different sets as follows
- According to different types such as VA, NNVA, Inspection, Transportation and Delay
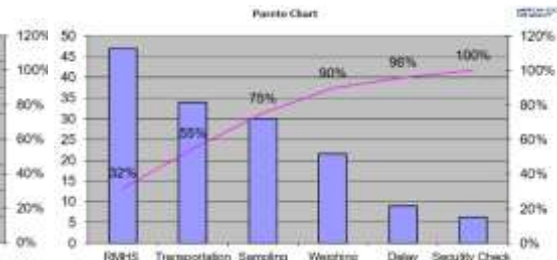

Fig-6

Fig-7

- Categorised as Critical Activity and Parallel Activity
- Different Processes such as security check, Sampling, Weighing, RMHS Unloading, Transportation and delay

RESULT

There are different ways like eliminating the process which does not add value in the process and reducing the time for the process by using line balancing and mistake proofing.

The Table below shows the time and distance that can be eliminated and removed by modification of the process.

Table 1: The time and distance that can be eliminated and removed by modification of the process

	Action	Distance	Mean
	Remove (in sec)	2500Ft	2107
	In minutes		35
Action	Reduce (in sec)	534Ft	4964
	In minutes		83
	No change (in sec)	1540Ft	2033
	In minutes		34

The different ways of Eliminating the process are as follows, Time eliminated is mentioned inside the brackets.
1. Remove After sampling weighing (6min).
2. Weighing the gunny bags from RMHS, removes the extra running time for gunny bag weighing

(Elimination of Accumulation of Gunny Bag) (14 min).
3. Final verification done in Weighing office rather than RMHS (18 min).
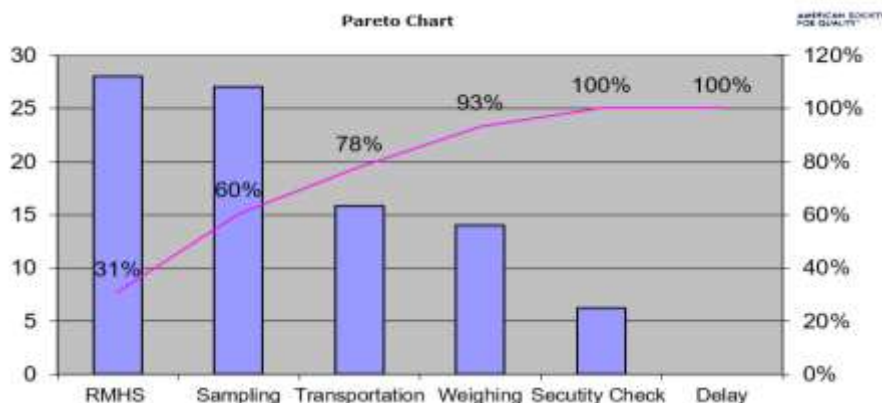4. After Weighing Direct Security check and vehicle Exit.

Fig-5: Pareto Chart Showing mean time of the process after process leveling Through this study scope of improvement is found by analysing detailed time study. Mistake proofing and standardization of work is also done to reduce the variation and improve the mean TTAT.

SCOPE OF IMPROVEMENT
Weighing Bridge Traffic
The oil filling trucks should have different setup of FLOW METRE rather than weighing machine which reduce the traffic, else Entry and Exit Different Weighing machine is another option.

Speed up RMHS Unloading
Conveyer belt direct unloading can be replaced with a different setup in which full copra unloading can be done and it transfer the copra to conveyer according to its loading capacity.

Making Paperless
The process is modified in such a way that all the documents are collected and checked by security, a ID number is given to the truck which can be used as reference in all processes. While exiting the documents are given with a ITD(In-bond Truck Details) sheet which details all the processes done inside plant.

CONCLUSION
The top management of the company analyse the proposed ideas and discuss within the respective department. The idea is then taken into account for implementation. Through this the process time is reduced from 141min to 81Min which means 56 minutes are saved.

This reduction in time helps in accommodating all the incoming trucks per day and could roughly save 11,50,000Rs per year which is given as penalty for holding the truck for more than a day. Through this the working hours are also made more efficient and effective. Plant productivity is also increased by this way.

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