Analysis of manufacturing of EOT crane by the means of Project Management for disclosing area of improvement

Purvi Chauhan[1], Jatan Patel, Ajay Meriya, Rushi Sha[2]
[1]Assistant Professor
[2]B.E.Students, Production Engineering Department, BVM Engineering College,Gujarat,India

Abstract
Manufacturing of EOT crane is combination of a multitasked project in an organization. Hence combination of management of man, material and machine is a tedious and complex task as EOT as it needs proper scheduling in order to deliver the crane before the due date[6,7]. Project management is the practice of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time. By analyzing the process at macro level one prepare network diagram and by the means of project management one can reach to area of improvement for better management of resources.[1,2,3,4,5,8].

Keywords: *Project Management, Crash Cost Analysis, Resource LevEOTing , Revision And Monitoring, Critical Path Method.*

INTRODUCTION

As there are Six manufacturing units of Anupam which are placed at Vitthal Udyog Nagar, They are performing many task related manufacturing like Machining, Welding, Plasma-cutting, Forging, hydraulic bending, Painting, Gear hobbling etc.
As company is suffering with many problems of optimising time and resources management of crane without compromising its performance and features. So here is an attempt to improve the time and resources management of Electrical Overhead Travelling Crane as much as possible resulting into cost reduction.

Figure 1 : Electrical Overhead Travelling Crane

RESEARCH METHODOLOGY

Different area under the project definition would be studied and process analysis of the different fabrication would be done with the help of network diagram from which the area of improvement would be drawn out and with the help of necessary tools suggestion would be made. The time and cost analysis would be done for the different suggestion which would lead to results and discussion at the end.

Process Analysis

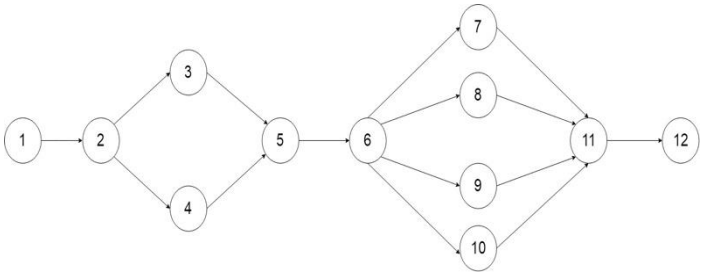

Figure 2 Network Diagram 1

Table 1 Events list for Network Diagram 1

Eevnt Number	Event Name	Time(days)
1	Work order release with CCD&BBU	**2**
2	Work order review	**2**
3	Approved vendor list	**3**
4	Tech. Specifications	**2**
5	Schedule	**1**
6	MPS Preparation & Release on monthly basis	**2**
7	APL/BOM/Drawing/Spare BOM	**17**
	Approved vendor & Spare List	**3**
	Approved QAP	**2**
10	Existing Stock Status	**1**
11	Purchase requisition for -raw material -Bough out items -Spare items	**4**
12	Report presentation	**1**

Such type of network diagram was made and critical path analysis was done.

Total Days for the Completion of Project

The total days for the completion of project is summation of critical days found from the critical path.
This is the maximum time the project would take for the completion.

Table 2 Critical Days

Network diagram	Critical days
1	32
2	26
3	32
4	28
5	28
6	30
Total days	176

This days are less than 6 months which mean s company dispatches the EOT crane on time according to customer due date.

Table 3 Areas of Improvement

Reason identification	Design	Material Delay	Space	Rework and Manpower	Transportation	other
Setback reason in per.	7.75	30.25	19.75	22.25	20	0

Suggestions to reduce time

1) For fabrication of body and other parts of EOT crane the company has to procure material from the kanjoda plant inventory which is near nadiad, hence the company setup in v.v.nagar has to request material one day before the use and in case of improper judgment or transportation the production line will be stopped. Also the company has to bear high transportation cost every time they issue material from the inventory.
   One solution for this is procurement of material from nearby source which is also not feasible as it will increase the cost of material.
   The feasible solution for this is maintaining the inventory near V.V.Nagar plant in odder to decrease the transportation cost as well as maintain company production line on time. as this material will only be used for the EOT crane the management of material will also became simpler.
   The unit - 6 which near all the V.V. Nagar plant location is best suitable for storing metal plate inventory as it not currently in use.

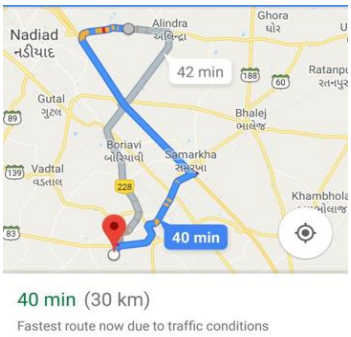

Figure 3 Current route

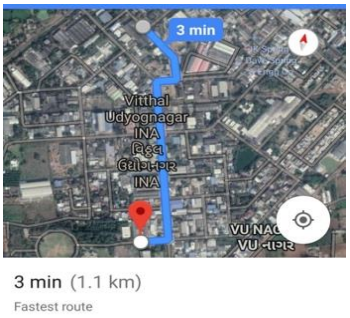

Figure 4 Modified route1

Figure 5 Modified route 2

2) Management of space is crucial for any company and for the company like Anupam For company like Anupam scrap management is very crucial as it incurs lots of space and cost for handling as well as storage.al the scraps of Plasma arc cutting and oxy-acetylene cutting are placed near those machine as well scrap other manufacturing process is gathered around that area. This scrap hinders the ongoing process as well as it uses most of the space unit 5. Hence is needed to proper mange this scrap.

One feasible solution for this is to move this scrap form unit -5 to unit- 6which is also near to the current location and also will not hinder the ongoing process. This will lead to increase to empty workshop floor space area up to 20 % of total work space area available which is a considerable amount of space for utilization for other purpose. Scrap management would be becoming very simpler this way as well it will help company in proper utilization of scrap

In the empty floor space area company could fabricate all the miscellaneous component which was been fabricated at the kanjoda plant which will lead to reduction in transportation cost as well as will lead to reduction in some amount of time.

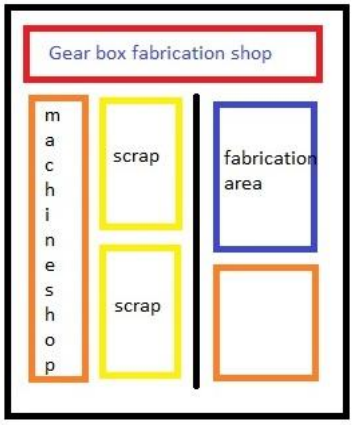

Figure 6 Current Layout

Figure 7 Modified layout

3) In manufacturing of the gudder whole process are to be done within the unit 5 except one part that is rope drum. The manufacturing of rope drum is done within the company while the machining of the rope drum is being done by the vendor. Company has small bunch of machine available in unit-5 and these machines are bottle neck. Hence to fasten the manufacturing Time Company should find an alternative.

One feasible solution for this is purchasing of heavy duty lathe machine which will machine the roop drum as well as lose some amount of pressure from current machine.

Machine capital comparison

Table 4 Current scenario

Description	Cost (Rupee)
Manufacturing cost	
Transportation cost	45000
Total cost	235000

Table 5 Machine Implementation

Description	Cost (Rupee)
Heavy duty lathe machine	1700000
Present cost	235000
Miscellaneous operation	60000
Total cost	1405000

By this the company will be able to save one day which was being wasted in transportation and manufacturing of the roop drum which was allocated to the vendor, now would be fabricated inside the company itself and another miscellaneous component.

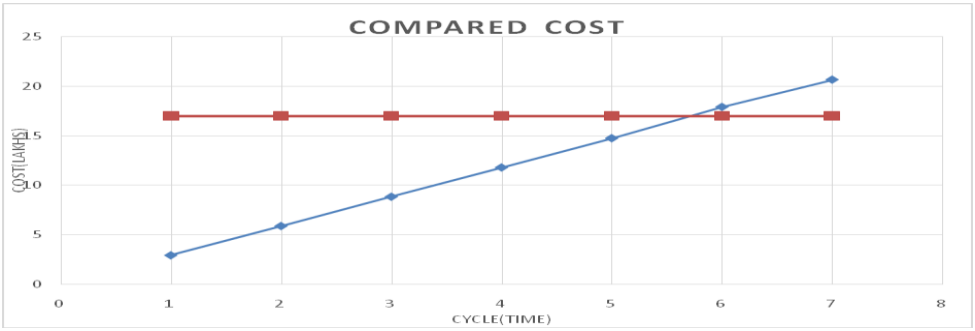

Figure 8 Cost Comparison

4) Manufacturing of all the parts of EOT crane are manufactured within the unit-5. Only for the blasting purpose all the parts are transported to the kanjoda plant near nadiad are also brought back to the plant for the assembly purpose. The lists of components for the blasting are as follow

Table 6 Component for the Blasting

SR.NO	List of components
1	Gudder
2	Gearbox
3	Bottom block
4	Hook
5	Boom
6	Hoist
7	Trolley
8	Gantry
9	Crab
10	Roop drum
11	End Truck

The transportation cost incurred by the company is very high as the company has to transport every part one by one between the plants.

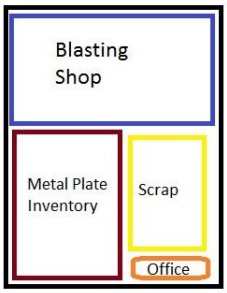

Figure 9 Unit-6 layout Modification

For the transportation of each component 3 hour is needed for one route hence total 33 hours will be need for transportation which is approximate four days.
Cost of transportation varies from component to component for instance it is taken as 20,000.

Table 7 current market cost for shed

Description	Cost
Metal sheet	75 Rs/ sq.ft
Fabrication	100 Rs per kg

Table 8 Shed Cost

Description	cost
10 m*500 m shed size	403500
Fabrication cost	25000
Total cost	428500

Table 9 Cost analysis for Shed

Description	cost
Shed cost	428500
Transportation cost	220000
Total cost	208500

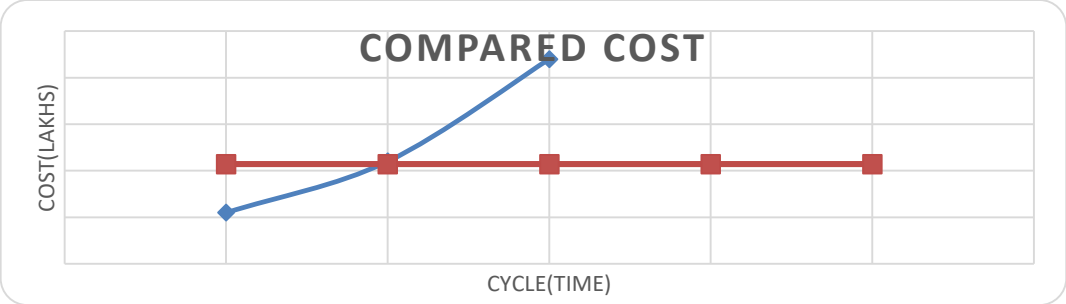

Figure 10 Cost Comparison

5) Work environment plays a vital role on worker as well as every employee mindset hence is should be according to working ergonomics principal will increase the work performance factor which will lead to increase in production rate. This was found lack in the company.

CONCLUSIONS

With these company would be able to save 867875 Rupee after approximate 2.5 year.Roop drum and other component can easily fabricated within the company without any external help of material or manpower.One Time Capital Investment.Company is more self-reliant.Whole EOT Crane would be manufactured in V.V. Nagar Plant.With this transportation cost would be reduced up to 80 % before assembly.

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