International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 04 | Apr 2019 www.irjet.net p-ISSN: 2395-0072

Value Analysis Aimed at Cost Reduction in Wooden Bed Manufacturing

Rushil Kadu[1], Mayuresh Kamatkar[2], Amol Karne[3], Shital Patel[4]

[1,2,3]B.E. Student, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Kharghar, Navi Mumbai. India
[4]Professor, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Kharghar, Navi Mumbai. India

---

Abstract - *The purpose of this study was to analyze the prospect of cost reduction through value analysis technique. A manufacturing process of a conservative wooden bed is studied to apply the value analysis technique in order to decrease the cost. Value Analysis is one of the foremost techniques of cost reduction and control. It is a meticulous approach which ensures the necessary functions for the minimum cost without diminishing quality, reliability, performance and appearance. This study focuses on the design alteration of the wooden bed by varying the utilization of material used for manufacturing it. This study presents the purposeful cost analysis of wooden bed and ideas are projected to reduce the cost of manufacturing of the product. Through newly projected ideas, cost saving in single product is conceivable to be 25% of the former manufacturing cost.*

Key Words: **Value Engineering, Performance, Wooden bed, Cost reduction, Cost comparison.**

1. INTRODUCTION

Value engineering is the organised application of recognised techniques which identify the function of a product or service, establish a monetary value for the function and provide the necessary function reliably at lowest overall cost. Value Engineering analysis techniques can be applied to any product and can be process procedure system or service in different kind of business or market activity including health care, construction, industries and in the service sector areas. It is a primary aspect of value engineering such that basic functions can be preserved for the value improvements. Its main momentous is improvements in quality and reliability of the product by focusing the team's attention on the functions that detect most of the problems, and the most likely reason behind these problems.

1.1 Value engineering in manufacturing industries

Today Value Engineering play an important role to it control over the various factors such as cost, performance and quality, of the various products in the industries. Value Engineering is concerned with the cost reduction, quality enhancement, and installation of integrated system of men, material, and machines for the benefit of the industries. It provides specialized knowledge and skills in the methods of engineering analysis, predict and evaluate the results to be obtained from such systems. For every industry it is necessary reduce the extra cost associated during the production time and maintain the quality of the product up to certain level according to the demand of the customer and all these things helps the company for his survival as a competitor in the market.

1.2 Customs of Value Engineering

1. It is a cost deterrence as well as cost abolition technique thus reducing cost of the product.
2. Aids employees for better understanding of their jobs and orients them towards creative thinking
3. Balance the cost and performance.

2. LITERATURE REVIEW

Value Engineering is a function concerned with the systematic team approach to improve the worth of goods, products or parts and services by using and finding the role. Value product therefore increases or decreases depend upon either by improving the role or reducing the cost. It is a primary phase of value engineering such that basic functions be preserved and not be reduced as a consequence of pursuing value improvements [1].

Value engineering is essentially a process which uses function analysis, team- work and creativity to improve value. Value Engineering can be applied during any stage of a project's design development cycle. However, the greatest benefit and resource saving are typically achieved early in the development and conceptual design stages [2].

Value Engineering and SWOT techniques are used to achieve the best for decision making and management issues through the consideration of creative ideas for improvement [3].Value engineering is an efficient tool among them for fostering the construction quality with an aim of low cost and high services. The function analysis is carried out with the help of FAST tool and the projects study deals with a step by step process in order to reach out better quality with lower cost [4].

3. METHODOLOGY

1. Information source
2. Functional Evaluation
3. Creative Phase

4. Assessment Phase

3.1 Information Source

The data for the wooden bed has been collected from the furniture industry situated in Industrial Area Kirti Nagar Satara. During the project analysis in the furniture industry the data related to wooden bed is taken for analysis, like the wooden raw material, layout, storage, scrap storage, tools used, finished and semi finished products are recorded for analysis.

3.2 Functional Evaluation

The detailed information of the cost of major modules of wooden bed is listed in table 3.1. The weight and percentage cost of all the modules is tabulated in functional evaluation table 3.2. For better understanding of the functional evaluation the graphical view of the data is provided in figure 3.1.

Sr no.	Part	Quantity	Cost (₹)
1	Top slat	1	500
2	Side rail	2	550
3	Side bottom rail	2	450
4	Legs	4	450
5	Side slats	4	300
Total Cost			2250

Table 3.1 Costing of wooden bed

Sr no.	Part	Weight(kg)	%Cost
1	Top slat	9	22.22
2	Side rail	7	24.44
3	Side bottom rail	7	20.0
4	Legs	9	20.0
5	Side slats	5	13.33

Table 3.2 Functional Evaluation

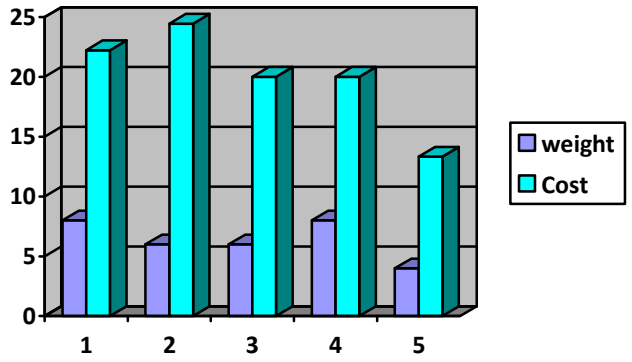

Figure 3.1 Component's Weight and % Cost

3.3 Creative Phase

In this phase various options available to us to reduce the cost of the final product which were suggested in the brainstorming session are mentioned.

1. Make slots in the Top slat.

The material removed to make slot can be utilised as side rails which will reduce the cost and weight of the bed.

2. Optimize the thickness of wood by strength analysis.

Implementing this idea can reduce the material cost without compromising its functional capability.

Function-Cost-Worth-Analysis (FCWA) is implemented to get the effectiveness of the proposed ideas in reducing cost and value addition in the product.

Part	Old cost	New Cost
Top slat	500	440
Side rail	550	385
Side bottom rail	450	365
Legs	450	345
Side slats	300	300
Total Cost	2250	1835

Table 3.3 Function Cost Worth Analysis

3.4 Assessment Phase

In this phase the evaluation of the product after imposing the ideas discussed in creative phase is done to show the percentage reduction in cost of every module and also the total reduction in the cost of the product.

Part	% cost reduction
Top slat	12.0
Side rail	30.0
Side bottom rail	18.89
Legs	23.33
Side slats	0.0

Savings in total cost = ₹ 415/-
% Savings in cost of product = 18.44%

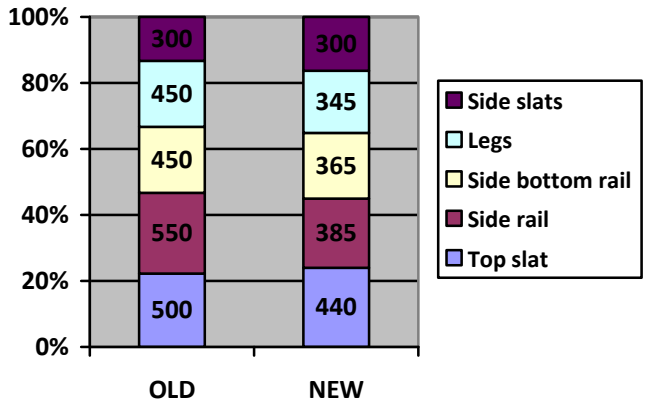

Chart 3.2 Cost Comparison

3. CONCLUSION

Applying the proposed ideas the cost is effectively reduced by 18.44% of the previous cost of manufacturing. With the implementation of value analysis the cost saved per product is ₹ 415/- , which is enough to buy two pairs of legs. The new design will also reduce the weight of the bed and improve aesthetics.

REFERENCES

[1] Miss Apurva J Chavan, "Value Engineering In Construction Industry", International Journal of Application or Innovation in Engineering & Management (IJAIEM), Volume 2, Issue 12, December 2013, ISSN 2319 – 4847.

[2] Amruta Chougule, A. K. Gupta and Sneha Patil, "Application of Value Engineering Technique to A Residential Building – Case Study", International Journal of Innovative Research in Advanced Engineering (IJIRAE), Volume 1, Issue 12, December 2014, ISSN: 2349-2163.

[3] Mostafaeipour, M. Mortazavi and N.Sadra-Abarghouei, "Implementation of Value Engineering for strategy formulation - Case study: Fisheries sector", Iranian Journal of Fisheries Sciences, Volume 10 Issue 4, PP:689-707, 2011.

[4] Nayana Tom and V. Gowrisankar, "Value Engineering in Residential House Construction", Volume 6, Issue 6, PP. 46-52, June 2015, ISSN 0976 – 6308 (Print).