

**A REVIEW PAPER ON “PRODUCTIVITY IMPROVEMENT IN SMALL SCALE
INDUSTRY THROUGH LAYOUT OPTIMIZATION USING THE PRINCIPLE
OF LAYOUT MANAGEMENT”**Prof .S.S.Gosh¹ Rajat Shende² Rupesh Lonare³ Puja Hedao⁴¹Assistant Professor,^{2,3,4}Student,
^{1,2,3,4}J D College of Engineering,
Nagpur 441501, INDIA.

ABSTRACT:-Layout construction consist a efficient physical settlement of different departments, work stations, machines, equipment, storage areas and common areas in a production plant. The now a days competitive all around environment, the most facility layout has become an efficient appliance in cost minimization by improve the productivity. It has become very needed to have a good organized plant layout to all possible resources in an optimum style to achieve the maximum returns from the capacity of facilities. To obtain the optimization purpose a lot of techniques are grown by many experimenters in the land area. The purpose of this paper is to analysis the additions in the field not only to layout of plant on the other re-layout also.

1. INTRODUCTION

Plant layout to Small Scale business is closely related with the industry building and made up area. From the point of view of plant layout, we can classify small business or unit into three categories as Manufacturing units, Traders and Service Establishments. The all aim of plant layout is construction a physical settlement to meets the needed output quantity and quality most economically or Plant layout ideally relate portion of space and settlement of equipment in such a manner that all operating costs are reduce.

the facility layout are combination of the natural settlement of department, workstation, machine, equipment, material, common areas etc. within an existing or proposed industry. Maximum plant layout is designed correctly for the initial conditions of the business. However these layouts provide many bottlenecks during growth period. Hence as elongate as capacity arise, it has to confirm the internal and external changes for which a re-layout is important. The reasons for a re-layout are due to changes in production volume, changes in process and technology and changes in the product.

The frequency of re-layout depends upon requirement of the present situation. Hence facility layout design is a continuous reiterative process based upon the changing constraints of dynamical environment. So development of facility layout is position based requirement of the industry, The indication that allow the need for a re-layout are congestion and poor utilization of space, overload stock in process at the facility, big material handling distances, bottleneck at factory, idle time of facilities and workers, all over labor and uncomforted, accidents and problem in controlling operations and personnel.

The study of plant layout is a technical study, plant layout is used for analysis of dissimilar physical shape for a assembling plant. It is called Facility Planning and facility Layout. The layout of plant refers to the physical facility placement like machines, equipment, tools, furniture etc. in like a style have fast flow of material at the fewer prices and with the less number of handling in processing the products to the receipt of raw materials for the last product delivery..

Webster and Tyberghein define layout flexibility as the cability of a layout to acknowledge to known and upcoming product mixes. They deal with the largest flexible layout to be minimum material handling cost over a number of demand summary.

Burlington and Webster expand this definition to the multi-time case and present a method for calculating layout flexibility based on judging the costs of upcoming re-layouts. They advise that these amount be used as additional criterion in calculating the most adjustable layout. A adjustable layout is one that would maintain less material handling amount against variations in the product demand levels and variations in the resulting material handling flows.

LAYOUT TYPES

- Product layout.
- Process layout.
- Fixed layout.
- Cellular layout.

1. Product Layout:

The all processing appliances and machines are setup allow to the continuity of process of the product, is called product layout. In this layout, single type products are produce in working place. This product need be consistent and produced in maximum quantities in arrangement to approve the layout of product.

Advantages

- (i) Material transferring cost is less.
- (ii) Operating processes is less.
- (iii) Machine and men utilize very good.
- (iv) Less space is required to material in movement and for unstable storages.
- (v) The production control is simple.
- (vi) Reduce total production period.

Disadvantage

- (i) No adjustability which is almost needed is achieve in layout of product.
- (ii) The production costs increases with reduce in size of production.
- (iii) When two or one lines are dynamic rich, there is calculation machine idleness.

2. Process Layout:

The layout of process is especially useful where less area of construction is requirement. the products are not consistence, the process layout is also low attractive, because it has making process adjustability than other. In layout of process, the machines are disorder according for one line of operations but are arrange allow to kind of the working or nature. Layout of process is mostly acceptable to non-repeated product.

Advantages

- (i) Reproduction of machines is less. Equipment purchasing cost is reduced.
- (ii) The specialization at various levels by done good and grater effective control.
- (iii) More flexibility in employee and appliance in this manner transfer of load is simply controlled.
- (iv) Good utilization of appliance available is possible.
- (v) Break down of appliance may be simply handled by passes work to another machine/work place.
- (vi) There is good control of difficult or correctness processes, particularly where is inspection needs.

Disadvantages

- (i) There are longer material transfer lines and the costly handling is needed.
- (ii) More total working cycle time unsettled to longer area and delay at different points.
- (iii) Since large work in sequence and delay for other procedure therefore bottle necks happens.
- (iv) Large floor space is needed.

3. Fixed Layout:

The fixed layout is smallest important for now days manufacturing industries. The fixed layout is big parts stay in a fixed position, other materials, man power, tools, parts ,machinery, and other supporting appliance are convey to this position. The big component or shape of the product stays in a standard location since it is heavier or bigger and it is cost-effective and useful to bring the essential devices and equipment to work station ahead including the man power. The fixed layout used in hydraulic, boiler manufacture, ships and steam turbine.

Advantages

- (i) Minimized material movement..
- (ii) Minimized capital investment.
- (iii) The work is usually complete by team of operators, therefore continuous of procedure is assure.
- (iv) Working centers are free of each other. Therefore, efficient loading and planning may be formed. Thus total manufacturing investment will be decrease.
- (v) It offers big flexibility and allowing change in product shape and size, and production volume.

Disadvantages

- (i) Skillfully man power is necessary.
- (ii) More time required to movement of machine equipment to production center.
- (iii) Difficult fixtures can be essential to positioning of devices and jobs.

4. Combination Type of Layout:

Now a days in pure state any one form of layouts discussed above is rarely found. Therefore, generally the layouts used in industries are the compromise of the above mentioned layouts. Every layout has got certain advantages and limitations. Therefore, industries would like use any type of layout as such.

Flexibility is a very important factory, so layout should be such which can be molded according to the requirements of industry, without much investment. If the good features of all types of layouts are connected, a compromise solution can be obtained which will be more economical and flexible.

LITERATURE REVIEW

Sr. No	Literature Review		
<i>Title of research paper</i>	<i>Author</i>	<i>Description</i>	
1	A Case Study Of Plant Layout: To Compare Production Efficiency Of Manual Plant Layout And Computerized Plant Layout Using Arena Software	Priyanka Yadav ¹ , Suman Sharma ²	These Studies Gave A Fantastic Change In Production Rate, Productivity & Plant Efficiency With Efficient Utilization.
2	Comprehensive Survey On Optimum Plant Layout Design	Dr. P.Sivasankaran	In Order To Obtain The Maximum Rate Of Return It Is Advisable The Change The Plant Layout Design To Achieve The Better Efficiency.
3	A Literature Review On Efficient Plant Layout Design	Sanjeev B. Naik Dr. Shrikant Kallurkar	In Today's Competitive Global Environment, The Optimum Facility Layout Has Become An Effective Tool In Cost Reduction By Enhancing The Productivity.
4	Layout Design For A Low Capacity Manufacturing Line: A Case Study	Filippo De Carlo ^{1,*} , Maria Antonietta Arleo ² , Orlando Borgia ¹ And Mario Tucci ¹	The Result Of The Case Study Showed A Slight Advantage With The Lean Approach In Considering Such Efficiency Indicators.

5	A Model For Effective Development Of Plant Layouts And Material Handling Systems	Daniel Bäck, Peter Johansson	In This Thesis Was A Model Developed, In Order To Improve Deficiencies In Existing Literature Regarding The Layout Problem .
6	Optimization Of Assembly Line And Plant Layout In A Mass Production Industry-A Literature Survey	Parminder Singh, Manjeet Singh	It Provides A Detailed Analysis Of Different Aspects Of The Literature To Identify Research Trends Through Innovative Data Mining Approaches As Well As Insights Derived From The Review Process.
7	Improvement Plant Layout Based On Systematic Layout Planning	W. Wiyaratn, A. Watanapa, And P. Kajondecha	The Purpose Of This Research Was To Modify The Present Plant Layout Of Canned Fish.
8	Layout Planning: A Case Study On Engineering-To Order Company	Miroslaw Matusek	This Paper Presents The Practical Application Of Systematic Layout (SLP) In Engineering To-Order Company.

CONCLUSION

This research paper has provided a good exposure to facility planning and layout designs for the improvement of the efficiency. The choice of which type of facility layout to adopt can have a significant impact on the long-term success of a firm. This decision, therefore, should not be considered lightly, but only after a through analysis of the operational requirements has been completed. A major issue to be addressed in facility layout decisions in manufacturing is: How flexible should the layout be in order to adjust to future changes in product demand and product mix. The study of layout has become extremely important. The most common objective of layout design, that is to minimize distance travelled, is not always suitable for all the manufacturing industries. Congestion in a specific area may have to be tolerated while maintaining minimum separation between facilities. Instead of criterion of minimizing total distance travelled, one may wish to minimize the total distance of the material travelled.

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