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A Critical Study of Flexible Manufacturing System

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***Abstract*: In today's scenario with increasing customer expections with minimum product prices the industries has been compelled to reduce their product price for keeping themselves alive in the competitive market.**

Flexible manufacturing system is a system that is able to respond to changes conditions.

***Keywords*: flexible manufacturing**

1. Introduction

A flexible manufacturing system is a system in which there is some amount of flexibility that allows the system to react in case of changes, whether predicted or unpredicted.

A flexible manufacturing system is a type of industrial process that allows the equipment to be used for more than one purpose.

2. Types of FMS

Depending upon the kind of operation.

A. Processing Operation

It perform the some activities on the job. The activities are convert the job from one shape to the another continuous up to the final product.

B. Assembly Operation

It comprises the assembly of two or more parts to make a new component which is called an assembly or sub-assembly.

Based on the no. of machines
Single machine cel (SMC).
Flexible manufacturing cell (FMC).
Flexible manufacturing system.
Based on the level of flexibility
Dedicated FMS.
Random FMS.

3. Literature

Chawla et al. In this research paper the increase in the application of AGV's in to investigate various AGV's related issues to optimize the material handling operations and maximize the sustainable production output and profit. The high investment required for a FMS and the potential of FMS as a strategic competitive tool make it attractive to engage in research in this area.

4. Objectives of the FMS

- Flexibility
- Automation and integration
- Reduction in manufacturing lead time
- High productivity
- Reduction in manpower
- Reduction in material handling

5. Advantages

- Increase machine utilization
- Lesser no. of machine required
- Greater flexibility
- Lower manufacturing lead time
- Improve efficiency

6. Limitations

- High initial cost
- High maintenance cost
- Worker unemployment

AHP is a multiple criteria decision making tool. This is an eigen value approach to the pairwise comparision.

Application of AHP in different fields such as planning, selecting a best alternative, resource allocation and optimization.

7. Conclusion

FMS control problem are very complex and different. Rather than attempting to

The optimum solutions of the problem formulations, research should be done on interactive scheduling and control of FMS where there is human input in the loop.

FMS is different things to different researchers.

- FMS is a revolution in the fields of manufacturing technology.
- FMS can be designed to meet the specific demand of each company.
- It is used for multi task operation.
- FMS required substantial investment of time and resources. There are some published papers using a simulation approach, but usually they do not provide comprehensive modelling of FMS.
- AHP has been used in many applications of the public

and private sector.

Future: This thesis reported with an issue that makes an attempt to model and analyzes the flexible manufacturing system layout with integrated scheduling and all possible aspects of FMS have been comprises in this work.

Classification: Hierarchies can be divided into two kinds – structural or functional hierarchy.

In structural hierarchies, complex system are structured into their constituent's parts in descending order according to structural property. (Such as ahape,colour or age.)

Functional hierarchies decompose comples system into their constituent parts according to their essential relationships.

Advantages of AHP:

- Process repetition
- Judgement and consensus
- Tradeoffs
- Synthesis
- Consistency
- Measurement.
- Hierarchic structuring
- Interdependence
- Complexity
- Unity

Limitations of AHP:

AHP used in many applications of the public and private and private sector.

- AHP was criticized for not providing sufficient guidance about structuring the problem to be solved.
- Forming the levels of the hierarchy for criteria and alternatives. AHP is the rank reversal problem.

The future work can be considering the following important issues:

- The proposed evolutionary algorithms can be extended for modelling and analyzing other layout such as carousel layout, any general facility layout etc.
- The material handling cost can be extended to minimize the multiple objectives by the variable cost between machines.

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