

Evaluation of Generic Flexible Manufacturing Systems

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Abstract – A regular Flexible Manufacturing System (FMS) has been considered under Planning Design and Control (PDC) methodologies. The central target is to test the effect of structure technique (steering adaptability) on system execution under arranging methodology (interchange system burden condition) with control methodologies (sequencing and dispatching rules). A PC reenactment model is created to assess the impacts of previously mentioned procedures eager for advancement range time, which is taken as the system execution measure. Most limited Processing Time (SPT). These heap conditions are Full Balanced Load (FBL), Balanced Machine Load and Unbalanced Processing Time (BMLUPT), Unbalanced Machine Load and Balanced Processing Time (UMLBPT) and Unbalanced Load (UBL) concerning machine burden and handling time. The aftereffect of the reproduction demonstrates that there is ceaseless decrease in make-range with increment in steering adaptability when both machine burden and handling times are unequal i.e., under UBL system condition.

Keywords – FMS, PDC, SPT, MINQ, MQMWT etc.

I. INTRODUCTION

The run of the mill Flexible manufacturing system. In the FMS, the crude materials are gone into the system and stacked on the CNC machine instrument with the assistance of pick and spot robot. The stacked part is machined and handled totally on the machine. The stacking and emptying are finished utilizing robots and moved to next machine utilizing robotized transport gave in the system. The machining procedure is cultivated utilizing CNC program. The crude material is being moved starting with one station then onto the next workstation utilizing committed bed. CNC machines apparatuses are outfitted with Automated Tool Changers (ATC) including instrument magazine to cover the wide scope of manufacturing procedure required. Robotized guided vehicles (AGV) are fused in the system to move the machined parts from workstations to distribution centers.

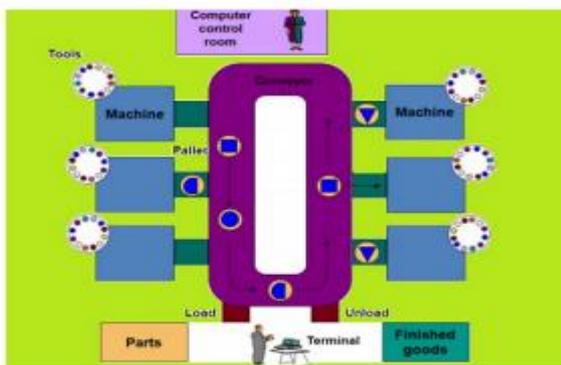


Fig. 1. Typical Flexible Manufacturing System.

The AGV are driverless PC worked vehicles handles the material exchange related exercises adequately and productively. Completed parts later on put away in programmed stockpiling and recovery system (AS/RS).

II. LITERATURE REVIEW

1. Flexible Manufacturing System Scheduling

• Cluster Formation

Clustering algorithms have been widely utilized in gathering innovation to gathering machines and parts into cells. The comparability between the parts having regular activities is utilized to frame groups. A few closeness coefficients are accessible in writing to shape groups. Canie distinguishes the requirement for a method which can evaluate whether an utilitarian or a gathering cell system of generation is most proper in a particular case just as build up the fitting system. He portrays the procedure of numerical scientific categorization and indicated how it might be applied to both gathering innovation and plant design. A PC program for creation stream investigation is introduced.

III. RESEARCH METHODOLOGY

The administration in this worldview can be clarified from the perspective of either the circumstance, or entertainer, or procedure. The circumstance is to be figured out how to a natural request by an entertainer through a deftly developed self-sorting out administration process which reproduces the circumstance. In this structure, the 'circumstance' viewpoint contains the present mechanical circumstance in assembling industry, while the association establishes the 'on-screen character'

perspectives. The job of new innovation versus sourcing rehearses in overseeing fabricating adapt abilities establishes the 'procedure'. The entertainer has different alternatives to work out, contingent on the circumstance and procedure, which structures his 'opportunity of decision'. In light of SAP, key learning's of a case are integrated, activities recommended and expected exhibitions are condensed. As indicated by Sushil (2001), SAP-LAP types are classified by different features. An endeavor has been made in this proposition to present SAP-LAP examination of following kinds for different contextual investigations.

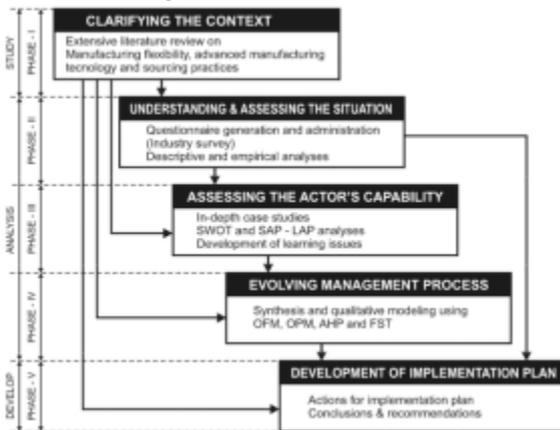


Fig.2 . Design of the study.

1. Survey methodology

A survey of different assembling associations, engaged with accomplishing producing adaptabilities at strategic and key level has been taken up by utilizing a particularly structured poll. Exceptional accentuation has been given to look for data identified with business methodology and execution of the associations, status of volume, adjustment conveyance and assembling adaptability and the job of innovation and sourcing rehearses in accomplishing adaptability at strategic and key level. The survey has been planned after broad writing audit and approved through friend survey from academicians, divisors and specialists from the business.

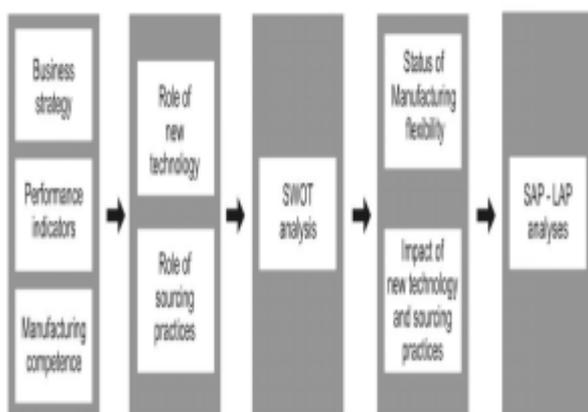


Fig.3. Methodology for conducting the case studies.

2. Options Field Methodology (OFM)

This depiction indicates what is acknowledged in the structure as well as what choices are rejected. The Options Field Methodology and the Options Profile Methodology give intends to careful improvement of plan circumstance, portrayals and configuration target depiction.

- This inquiry characterizes the specific circumstance and must, consequently, reflect considerable knowledge into the plan circumstance. The inquiry must be neither too expansive nor excessively thin. It must animate innovative and gainful reactions that don't stray from the subject under thought.

Table -I :Weights of various manufacturing Flexibilities

Respondent ⇌	Researcher	Sourcing Manager	Technology Manager
Objective ↓			
Volume Flexibility	0.081	0.221	0.105
Modification Flexibility	0.188	0.319	0.258
Delivery Flexibility	0.731	0.460	0.637

IV. DATA ANALYSIS FOR ORGANIZATION PROFILE

Questionnaire survey consists Organization Profile. In this section certain basic profile of the organization such as number of employees, age of the organization, Annual turnover, Tier of Industry and Awareness of Flexible Manufacturing System is presented. Frequency tables and appropriate graphs are presented for each variable.

1. Number of Employees

The number of employees in the organization. 41.9 percent of the organizations are having 0-100 employees, 44.8 percent of the organizations are having 101-500 employees, 9.3 percent of the organizations are having 501-1000 employees and remaining 4.1 percent of the organizations are having 1001-3000 employees.

Table-II: Number of Employees in Organization

Employee Range	Frequency	Percentage	Cumulative Percentage
0-100	72	41.9	41.9
101-500	77	44.8	86.6
501-1000	16	9.3	95.9
1001-3000	7	4.1	100.0
Total	172	100.0	

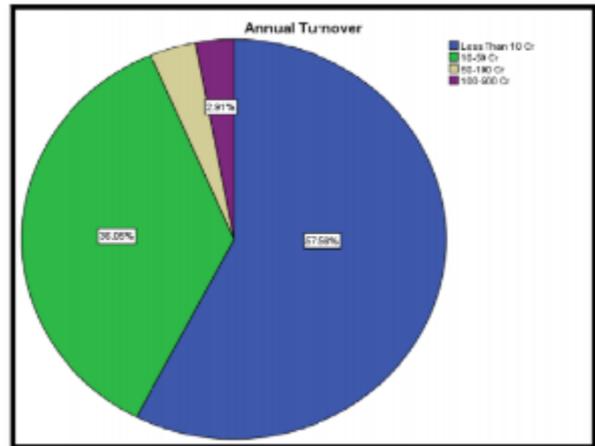


Fig.5. Annual Turnover of Organization.

V. CONCLUSIONS

Consumer loyalty is the top most and significant issue, which have been positioned as 77.9% by top administration and 86.6% by shop floor administrators. The client's needs and desires must be cautiously and consistently surveyed and comprehended, and each exertion has been made to meet those desires as well as to surpass them. This has been applied to both top administration and laborers.

Cooperation has been seen as the second most significant component having weight period of 57.7% by top administration and 68% by shop floor administrators. Groups have engaged the laborers to have relational aptitudes and gradual upgrades, which will positively affect the whole association and noteworthy supporter of the TPM achievement.

For approving the TPM study quantitatively, the estimation of OEE and distinguishing proof and examination of six major misfortunes were completed. The exact contextual investigation was led on chosen three TPM Manager model machines according to structured TPM Master plan in machine shop zone. It has included estimation of all parameters of OEE and to discover the misfortunes which were in charge of bringing down the OEE.

The different impalpable outcomes that were watched expanded in responsibility for and work environment by the workforce, an expansion in a positive soul, assurance and investing heavily in work, improved collaboration and gathering conduct among administrators and staff, which was significant for everybody and was perceived with certain prizes for their commitment.

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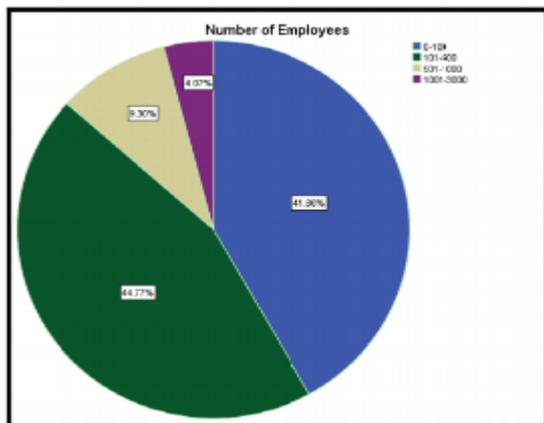


Fig.4. Number of Employees in Organization.

2. Annual Turnover

57.6 percent of the organizations are having annual turnover less than 10 crore, 36 percent of the organizations are having annual turnover between 10-50 crore, 9.3 percent of the organizations having annual turnover 50-100 crore, and remaining 4.1 percent of the organizations are having annual turnover 100-500 crore.

Table-III: Annual Turnover of Organization

Annual Turnover	Frequency	Percentage	Cumulative Percentage
Less Than 10 Cr	99	57.6	57.6
10-50 Cr	62	36.0	93.6
50-100 Cr	16	9.3	97.1
100-500 Cr	5	2.9	100.0
Total	172	100.0	

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