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# Review on Process Time Reduction From Design to Manufacturing Using Cad-Cam and Process Planning Activity for Improvement of Productivity and Quality

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**ABSTRACT:** To ensure the high productivity and quality by using CIM in a small scale die industry some aspects need to focus which are main purpose of this project. In small scale industry the current environment tends to force employee to work in isolation also it observed that they works on conventional machines when CNC or VMC machines are available, this is because of some certain problems which are not analyzed properly or failure to find root cause by system. To eliminate this mentality of workers there should be close neat observation of supervisory control is essential, also it is necessary to build an error proof system which lead to develop a system which focuses on productivity and quality control.

**KEYWORDS:** CIM integration, process time reduction, die manufacturing etc.

### I. INTRODUCTION

Press tool dies are normally developed as one-off tools in the manufacturing industries. The required quantity of sheet-metal component production is achieved with this single die which can be reground at the die-block and used perpetually. Before long, the component being produced becomes obsolete and hence the die is rendered obsolete too. The die produces number of components during its service life. Hence a single die is needed to be developed for the given component for a mass-production quantity. Now, since a die itself is produced as one-off unit, it is akin to a job-shop production process. The process being unique for each die, the manufacturer of the die normally ignores the effectiveness of the manufacturing process as the benefit realized of such effort would be insignificant for manufacturing a single die. With this background, consider a die manufacturing facility engaged in the manufacturing of die working on a continual basis executing the development of dies for a variety of clients.

Since there is an overwhelming similarity in the configuration of dies with respect to its elements, an attempt to organize and integrate this process of die-making can turn out to be highly fruitful in terms of the savings and the effectiveness of the manufacturing cycle associated with this die-making process. This would help in stream-lining all the necessary developmental activities of the shop-floor along with the design activities while being routed through the Process Engineering Department for ensuring the best process and method of development adopted for this exercise.

It is well known fact that in entire product life cycle the most time consuming process is the manufacturing process i.e. the machining operations as per customer demand. The same rule is also applicable for die making. The die contains some intricate shapes and complicated profile on itself which is not possible to produce by using conventional machining process. Also when conventional machining process are used, the time required to manufacturing for die is too large beside this it is very difficult to handle the quality issues arises in manufactured product. This makes the serious effect on the productivity of the firm. So, it is essential to focus on machining operations for reducing lead time.

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The modern tool room cannot say updated unless there is CNC or VMC machine set up. But still the company may face the problem of production delay and poor quality. This is because of lack of awareness towards proper process implementation. This is because of lack of knowledge of CAD-CAM system. Also the shop floor people cannot implement the process plan as instructed because of the limitation of bottleneck. The overall effect of such behavior is increase in production lead time, increase in the production time of individual element, poor quality management and imperfection of quality of end product. The success of computer integration will depend on the expertise of managers in implementing existing methods to take advantage of the potentials offered by new technologies.

For implementing CIM it needs education and training for the employees. Although people go through some training, seminar and workshop but due to not getting exactly what they want to do they cannot use the system related CAD-CAM effectively.

To overcome this deficiency and to implement the CIM integration this project helps the organization to keep up-to-date record related to design, process planning and manufacturing of the system and to place the required information at one place so that while extracting data it should be easy to extract as well as to upload. For this propose a simple user interface is developed in this projects which helps to collect the information with respect to time as well as delivers the information in very short time when requires. Also this project is focused on the concept like con-current engineering implementation in small scale industry. First part of this paper contains current practices i.e. the system presently works in small scale manufacturing industry and the unwanted effect of system on production floor in sense of increase in production time, poor manufacturing quality, workers mentality etc., next part includes the proposed system i.e. eliminated loop holes in the current system using new techniques which reduces the manufacturing time and improves the quality of end product, then the last part focused on comparison between the current system and proposed system in aspects of manufacturing time, quality of product and productivity.

## II. METHODOLOGY

### 2.1 Introduction to existed system

The existing process is explained also the problems in system and causes behind delay is also focused. The root cause behind the increase in production lead time, poor quality of end product and their relation with productivity is explained. The reason behind all problems is the faulty process flow or in other word the wrong way of working. Existing system contains some loop holes which causes lowering the workers efficiency. Also the system is mostly dependent on the workers skills and experience. The problem related to system is studied by using case study, in which a die is manufactured by using existed system. Time required for each individual cycle is taken into consideration for calculating the productivity and profit of the system. All these points are taken into consideration while designing the proposed system.

### 2.2 Current practices and problem identification

In current system, when there is new order is placed the product growth flow is as bellow,

- 1) Idea and concept is explained by the super authority to CAD department.
- 2) Rough design is generated by the head of CAD department
- 3) Design/ drawing/ modelling is created by CAD department i.e. team member of CAD department.
- 4) Forwarding the design to process planning department.
- 5) Generate the process plan for individual component
- 6) Generate process flow for entire process.
- 7) Forwarding process plan to manufacturing department i.e. CAM department along with NC code.
- 8) Running simulation of each component.
- 9) If problem arises making the change as per previous experience or knowledge.
- 10) Starting the production.
- 11) Send the component for testing.

The main reasons of increasing production time and poor quality observed in the current system is

- 1) Lack of systematic approach
- 2) Work in isolation

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3) Tendency to work on conventional machines

## 2.3 Objective of work

Objective of this dissertation deals with design of low budget system for CAD-CAM and process planning integration for a small scale die manufacturing industry to reduce process time by reducing machining time, programming time, assembly time, time required to trial etc. as well as error identification and elimination for improved quality of end product during production and to enhance productivity by increasing the profit of firm.

## 2.4 Flow of work in proposed system

- 1) Decision of new product is declared by head.
- 2) The following decision is taken by the super authority, head of design department, head of manufacturing department, head of process planning department and customer.
- 3) Rough decision and idea generation.
- 4) Suggesting option to the design.
- 5) Establishing or using standard part for production.
- 6) Eliminating the unnecessary process.
- 7) Considering the manufacturing and production floor problem.
- 8) Considering the possible error occur during the process i.e. error elimination.
- 9) Rough design for process planning sheet.
- 10) Rough design for process flow synchronization in such an order that other production should not get affected.
- 11) Reshuffling the process and design.
- 12) Finalize the plan.

## III. CONCLUSION

As per the above problem identified, we are implement the CAD-CAM process instead of conventional process and Comparing the machining time of Existing System & Proposed System.

## REFERENCES

- 1) S. Kumar, R. Singh b. A knowledge-based system (KBS) developed for selection of progressive die components. Journal of Achievements in Materials and Manufacturing Engineering. Jan-Feb 2007. Volume 20, issues 1-2.
- 2) John Johansen, Uday S. Karmarkar, Dhananjay Nanda, Abraham Seidmann. "Business Experience with Computer Integrated Manufacturing: A Survey of Current Strategy and Practice". Proceedings of the 28th Annual Hawaii International Conference on System Sciences 1995, IEEE, 1060-3425/95.
- 3) A.Gunasekaran. Concurrent engineering: A competitive strategy for process industries. The journal of the operational research society. Vol.49, No. 7. July 1998.
- 4) A.Gunasekaran. Implementation of computer- integrated manufacturing: a survey of integration and adaptability issues. Int. J. Computer integrated manufacturing, 1997, VOL. 10, NO. 1-4, 266± 280.
- 5) Mohammad Amin Okhovat ET. AL. Development of world class manufacturing framework by using six-sigma, total productive maintenance and lean, Scientific Research and Essays, 24 December, 2012 Vol. 7(50), pp. 4230 -4241, DOI: 10.5897/SRE11.368.
- 6) A.Gunasekaran ,P.Cecille. Implementation of productivity strategies in a small company, Elsevier Science Ltd. Technovation, May 1998, 311-320, 0166-4972/98
- 7) E.M. Shehab, H.S. Abdalla. Manufacturing cost modeling for concurrent product development. Robotics and Computer Integrated Manufacturing. 17 (2001) 341-353.
- 8) R. Addo-Tenkorang. Concurrent engineering (ce): a review literature report. Proceedings of the World Congress on Engineering and Computer Science 2011 Vol II WCECS 2011, October 19-21, 2011, San Francisco, USA.
- 9) Vinayak P. Bavchikar, Prof. P.N.Gore. Productivity & Quality Improvements By Using Computer Integrated Manufacturing (Cim) In Die Manufacturing Industry, Ijesrt,Jan-2016,Vol-5, Issn: 2277-9655