



ROLE OF CAD/CAM IN DESIGNING AND MANUFACTURING OF NEW PRODUCTS

¹Dr. Vikash Kumar, ²Dr. C. Mageswaran, ³V. Ravinder, ⁴B Rajendra Prasad

¹Associate Professor, Dept. of Mechanical Engineering, Malla Reddy College of Engineering, Sec-100

²Professor, Department of Mechanical Engineering, Malla Reddy College of Engineering, Sec-100

³Asst. Professor, Department of Mechanical Engineering, Malla Reddy College of Engineering, Sec-100

⁴Asst. Professor, Department of Mechanical Engineering, Malla Reddy College of Engineering, Sec-100

ABSTRACT:

Smart CAD/CAM technologies for superior product modeling within the intelligence of designing complete product variants become additional pertinent in future. several design techniques to assist knowledge base design actions in numerous engineering domains additionally to subsequent processes need to be developed. A necessary job to achieve this aim is to permanently investigate this state of the art, rising trends, new approaches, additionally to industrial issues and needs concerning the complete CAD/CAM area. With the aim of direct future analysis and development activities as close as possible to the unendingly rising an needs of a worldwide market we have a tendency to disbursed a wide-ranging national study in cooperation with one amongst the Germans leading CAD/CAM magazines. during this method, it became potential to achieve a representative quantity of users, to get their experience based mostly assessments on today's most significant aspects of CAD/CAM technology. The results of this examination are summarized during this paper to grant system developers, engineers, and researchers an overview of this condition as well on function a direction for call manufactures with in the design.

Keywords: CAD/CAM; CIM; CAPP; Product Development ; design ; manufacture.

.INTRODUCTION

In a globally competitive environment, time compression strategies in product development are of critically importance. Certain products have long development cycle times. Examples are aircraft and automobiles. In few products like computers, technological obsolescence keeps a constraint on the time required for product development.

Whenever a new microprocessor is released in the market, the manufacturer companies of the computers link with each other to market computers based on the new processor.

Frequent making of newer microprocessors have consistently narrowed down the product life cycle of computers. The pursuit of good in performance has resulted in new technologies having developed be further refined. Here focus is on manufacturing

planning, data management, supply chain management.

In entertainment electronics. The life cycle of computers and entertainment electronic products is thus reduced, thereby necessitating new products being delivered to the market at reduced intervals. The time compression in development has additionally necessitated

- Avoidance of design errors, make over of parts and tooling,
- Better information management,
- Improved provide chain management,
- Attaining higher and better levels of performance,
- Providing quality levels superior to what's offered by competitors,

- Above all provision the merchandise at the bottom potential price.

2.STAGES IN PRODUCT DEVELOPMENT

The need to be right 1st time anytime has modified the approach to style. The initial section of style consists of abstract style, style analysis and performance simulation.

The section is extremely repetitious as shown in (fig. 1) The techniques like coincident engineering, failure mode and impact analysis etc., area unit accustomed guarantee a reliable and quality style at this stage. this is often followed by careful style, tool style, prototype manufacture and analysis and documentation.

In (Fig. 2) consequent section of development concerned second section of engineering wherever the planning might activities in product development through seamless data transfer.

In (Fig. 3) CAD/CAM technologies help to simulate and the manufacturing methodologies in the following ways.

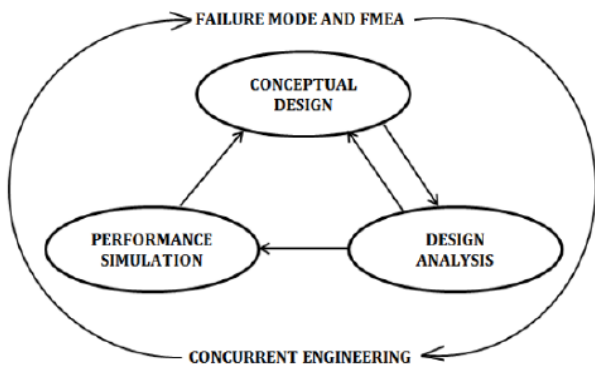


Fig. 1: Product Development Scenario



Fig. 2: Prototyping Stage of Product Development

3.PRODUCT DEVELOPMENT AND MANUFACTURE

CAD/CAM as an enabling technology for product development and manufacture Developments in computers and software relating to CAD/CAM have made CAD/CAM an indispensable enabling technology for time compression in product development. This is

made possible by an integrated approach to carry out different activities in product development through seamless data transfer. (Fig. 3) CAD/CAM technologies help to simulate and the manufacturing methodologies in the following ways.

3.1 Assemble Analysis

With the assistance of today’s CAD/CAM technology, style team will add a prime down and bottom up manner to form an entire electronic product model. Once an assembly is completed, solids based mostly kinematic analysis will be used to simulate advanced motions of mechanisms additionally to hold out tolerance analysis.

3.2 CAD/CAM in Aid to Manufacture through higher Tool style and Optimize manufacturing Processes

Manufacturing simulation uses a set of powerful CAD/Cam tools that ask for to create virtual manufacturing environment. several uncertainties which can lead to time delay work on an

production of defective components will be eliminated through simulation or manufacturing, whether or not it's CNC machining, plastic injection moulding, casting, forging or welding.

3.3 Rapid Prototyping technology

is being additional wide employed to verify and improve designs, fast tooling additionally as initial prototypes.



Fig. 3: CAD/CAM Database

3.4 Agile Manufacturing

Agile Manufacturing is oriented in the direction of high mix/ low volume, flexibility and adding velocity in the production process. It is applied to nature somewhere customizable order, suggest a required improvement. Consequently,

that manufacturing has been one of most important strategies of new enterprises. In the atmosphere of the market ongoing to vary the quality, speed, quick responds, at very low cost by improving its agility of the manufacturing firm. A work of many highly developed technologies in Agile Manufacturing atmosphere has been researched through a few examinations. Many of them comprise computer-aided design, CIM, computer-aided manufacturing, IT, computer-aided process planning (CAPP). A few number of papers include the researchers investigative the integration of such highly developed technologies in Agile Manufacturing environment.

3.5 Agile Manufacturing Conception and Enabling Technologies

Even though there are many definitions of Agile Manufacturing brought out as a result of the researchers, the most familiar definition is, Agile Manufacturing is the ability of a manufacturing association to manufacture a range of products contained by a short period of time also in a cost effectiveness approach. Agile Manufacturing is an idea to standardize general manufacturing data, CAD/ CAM structure, research data, and join together them into a network. a standardized research data base and a general manufacturing data base are very critical for agility and can considerably decrease planning period and the product design period.

3.6 Characteristics of Agile Manufacturing

There are many characteristics of agile manufacturing such as show in following:

- Rapid new product development,
- Short lead times, cycle times,
- Use of superior CAD/CAM,
- Modular design and technology,
- highly flexible machines and equipment,
- Short and fast order processing,
- Fast supplier deliveries,
- Very Short time to market,
- Short guide times and short cycle times,
- Highly flexible and responsive processes,
- Modular assembly,
- Use of Solids model.

3.7 mould industry

In recent machinery manufacturing industry, mould industry has developed into the start industry for national economic system. many innovative product development and production depends deeply on mould manufacturing experience, particularly within the lightweight industry, automotive industry, and region and physics industries. the potential of mould manufacturing and stage of subsequent technique has end up to be a major pointer of a nation's level of mechanical producing technique. It straight affects many sectors of the nation's economy. mould CAM/ CAD is developed from the origin brought regarding by the autonomous development of mould CAM and mould CAD. it's a unique jump within the wide-ranging application of mould producing and technology. The quick development of CAD/CAM technology and therefore the more development of software system and hardware level provided well-built technical support for mould business and brought a mount up the standard of production level, endeavor product style and producing. it's become the simplest possibility for a contemporary enterprise networking, integration and knowledge.

3.8 mold CAD/CAM

Desgin flow By suggests that of the speedy development {of producing}of producing} technology and technology there square measure growing issues on the way to shorten machining production period and mould design time and to reinforce manufacturing quality. mould technology is additionally migrating often from manual style, counting on manual data and normal machine process skill to mould package, assisted engineering and assisted producing technology. The United States has pioneered implementing technology on mould business, realizing mould CAD/CAE/CAM incorporated system and achieving functions of enhancing mould manufacture quality, boosting production time and design effectiveness.

4. CONCLUSIONS

This paper concluded the results of a study with reference to advanced CAD/CAM technologies in reference to product development and manufacture. This paper conferred this methodologies are being employed and therefore the future oriented methodologies are going to

be preferred. CAD/CAM users additionally as designers are asked to rate many sensible CAD/CAM technologies in relevance development and manufacture. moreover, issues in reverence to the consciousness of product variant style are mentioned. The Constant development of product style and manufacturing progressively bring down impacts upon sensible CAD/CAM technologies, proposing larger necessities for the analysis on and growth of CAD/CAM.

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