

CAD/CAM 23ME506

Topic: Unit I INTRODUCTION TO CAD/CAM

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Unit 1

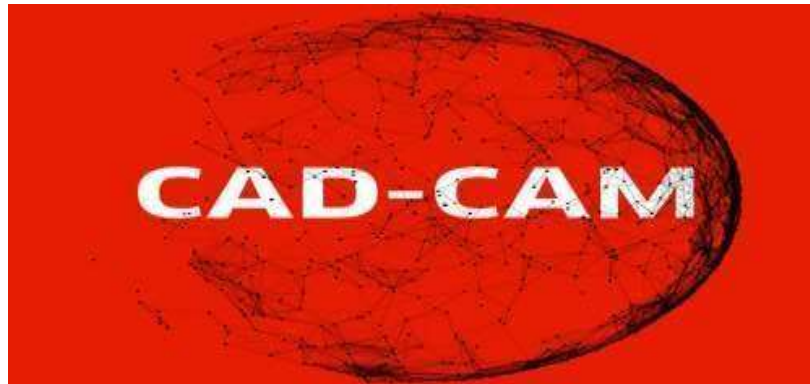
INTRODUCTION

CAD is used in many applications

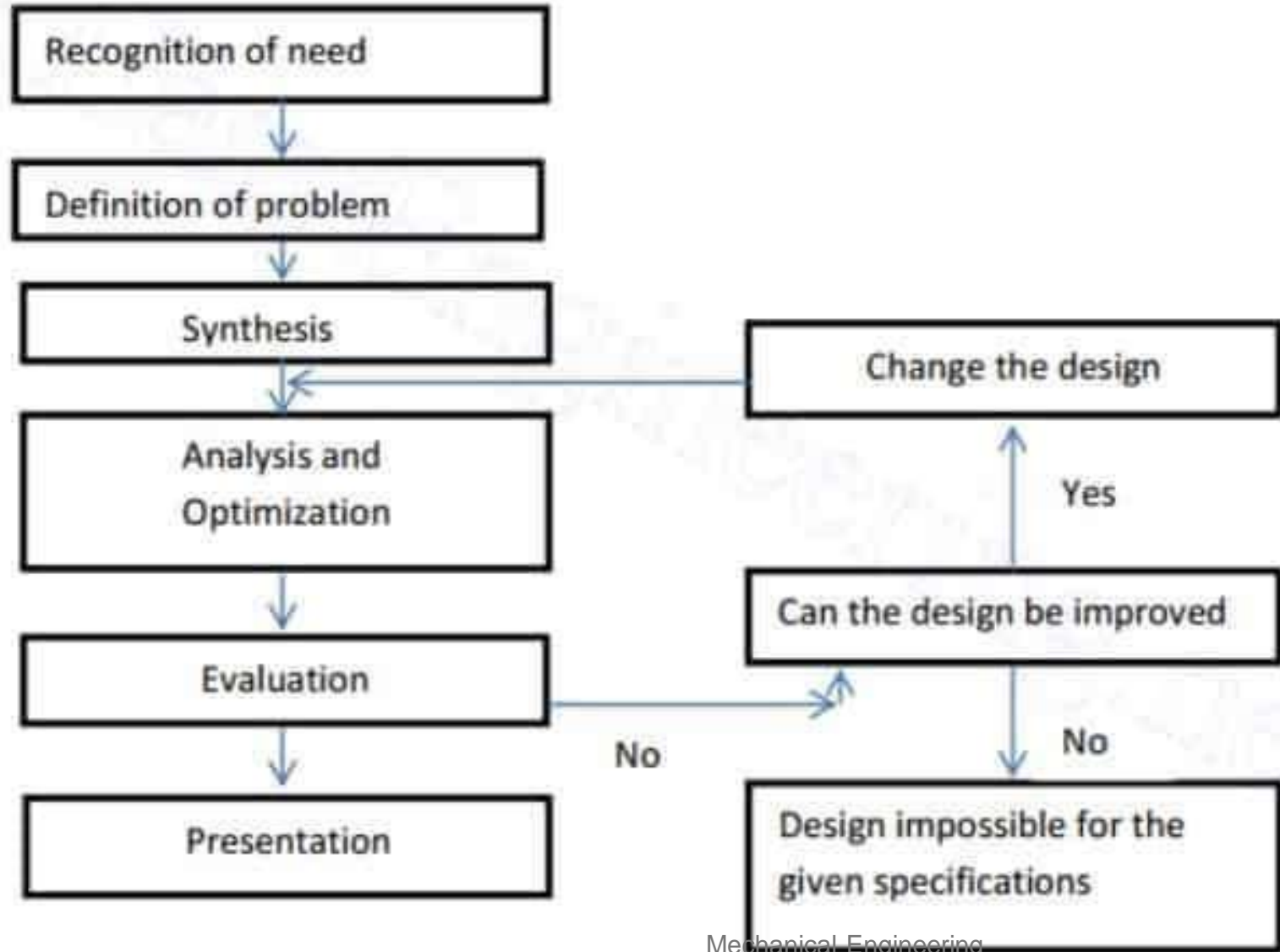
- ✓ including automotive,
 - ✓ shipbuilding,
 - ✓ aerospace industries,
 - ✓ industrial
 - ✓ architectural design
-
- ✓ 2D CAD programs usually include a library of geometric images; the ability to create Bezier curves, splines and polylines;
 - ✓ Among the most popular 2D CAD programs are AutoCAD, CADkey, CADD5, CATIA v4 and Medusa.

Need of CAD

- The purpose of CAD is to optimize and streamline the designer's workflow, increase productivity, improve the quality and level of detail in the design, improve documentation communications and often contribute toward a manufacturing design database
- CAD helps users create designs in either 2D or 3D to visualize construction, and enables the development, modification, and optimization of the design process.



PROCESS OF CAD/CAM



using that portion to be

CAD allows :

- **to create more accurate design**
- **CAD replaced manual design drafting,**
- **allowing design development,**
- **alteration and optimization.**
- **CAD enables engineers to craft more precise**
- **designs and manipulate them virtually.**

Advantages of CAD

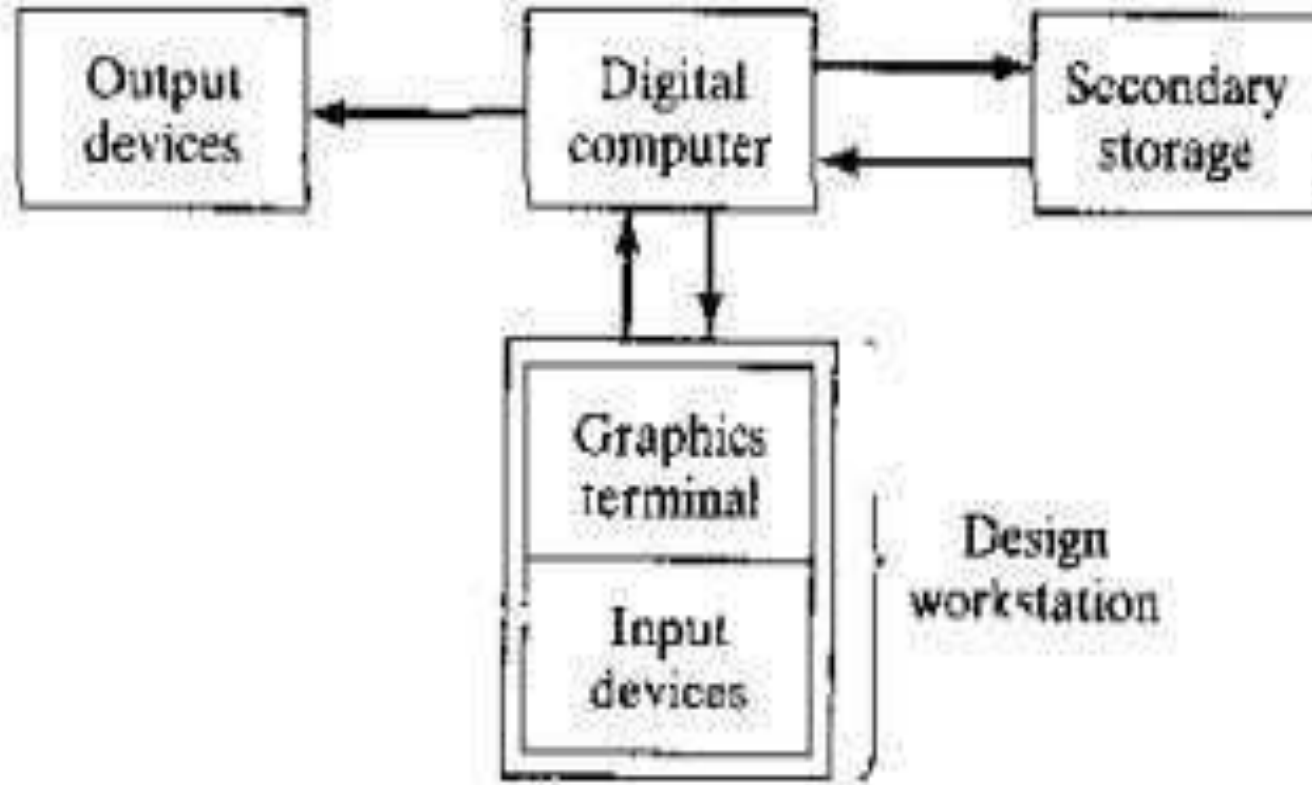
- ✓ **Saves Time.** The ongoing era of product development entails a lot of competition.
- ✓ **Increases Productivity.** Time saved translates directly into augmented productivity.
- ✓ **Improves Accuracy.**

The five types are:

- 2D CAD (flat drawings of product)**
- 2.5D CAD (Prismatic models)**
- 3D CAD (3D objects)**
- 3D wireframe**
- surface modelling (skeleton like inner structure)**
- solid modelling (solid geometry)**

peripheral devices include:

- ❖ **printers,**
- ❖ **external floppy disk drives and**
- ❖ **other data storage devices,**
- ❖ **monitors,**
- ❖ **keyboards,**



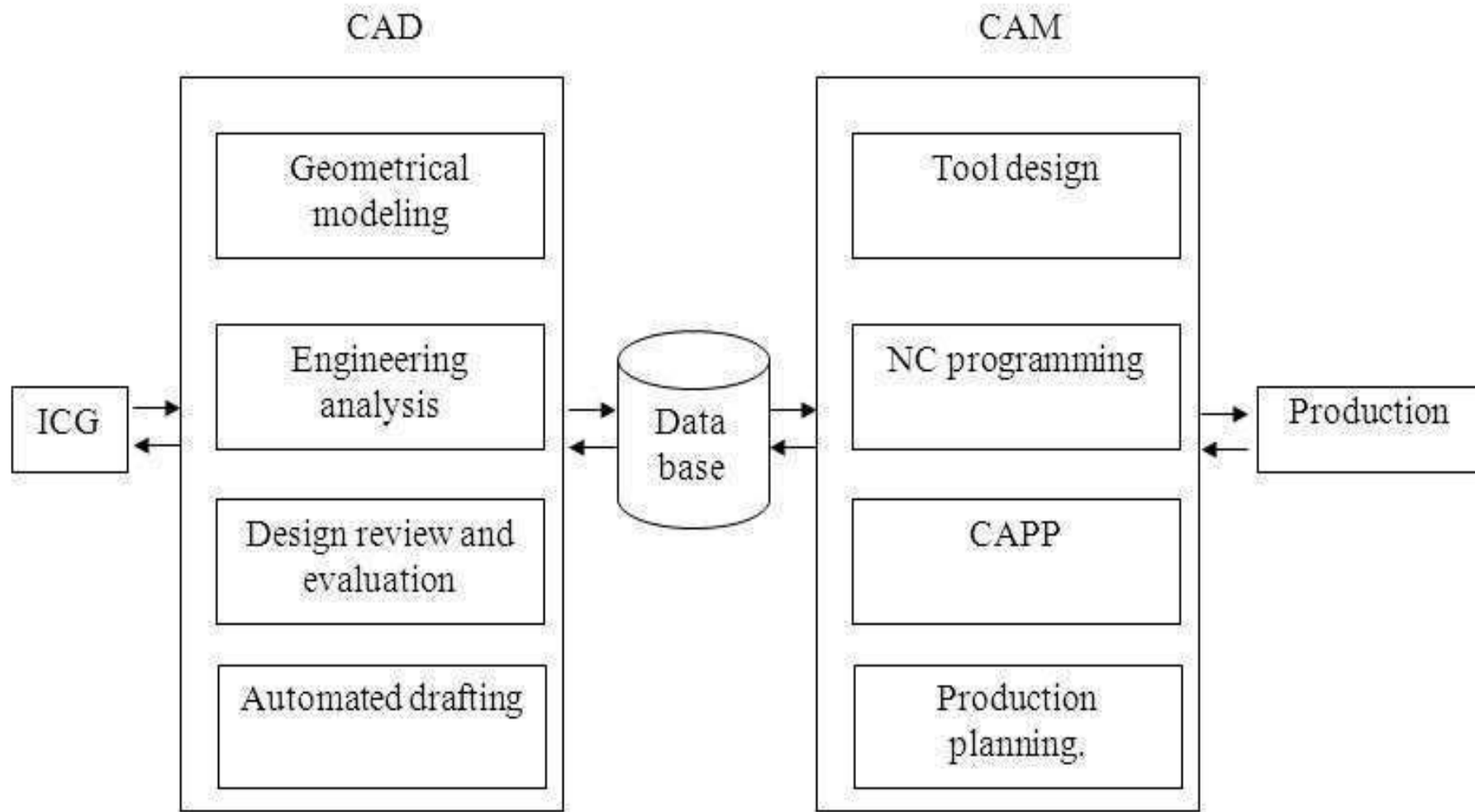


Fig. 1.4 The CAD/CAM relations

GEOMETRIC MODELLING

- A prototype is needed for testing and optimizing design.
 - Costly
 - Time consuming
- CAD eliminates the need of developing prototype.
 - Assists to evaluate the design.
- “Computer compatible mathematical description” of the geometry of the object is called as **geometric modelling**.
- CAD software allows the mathematical description of the object to be displayed as the image on the screen of computer

3D MODELING

There are three basic types of three-dimensional computer geometric modeling methods:

- **Wireframe modeling**
 - modeling the curves of the part.
- **Surface modeling**
 - Model the surfaces of the part, but without knowledge of material.
- **Solid modeling**
 - full solid representation

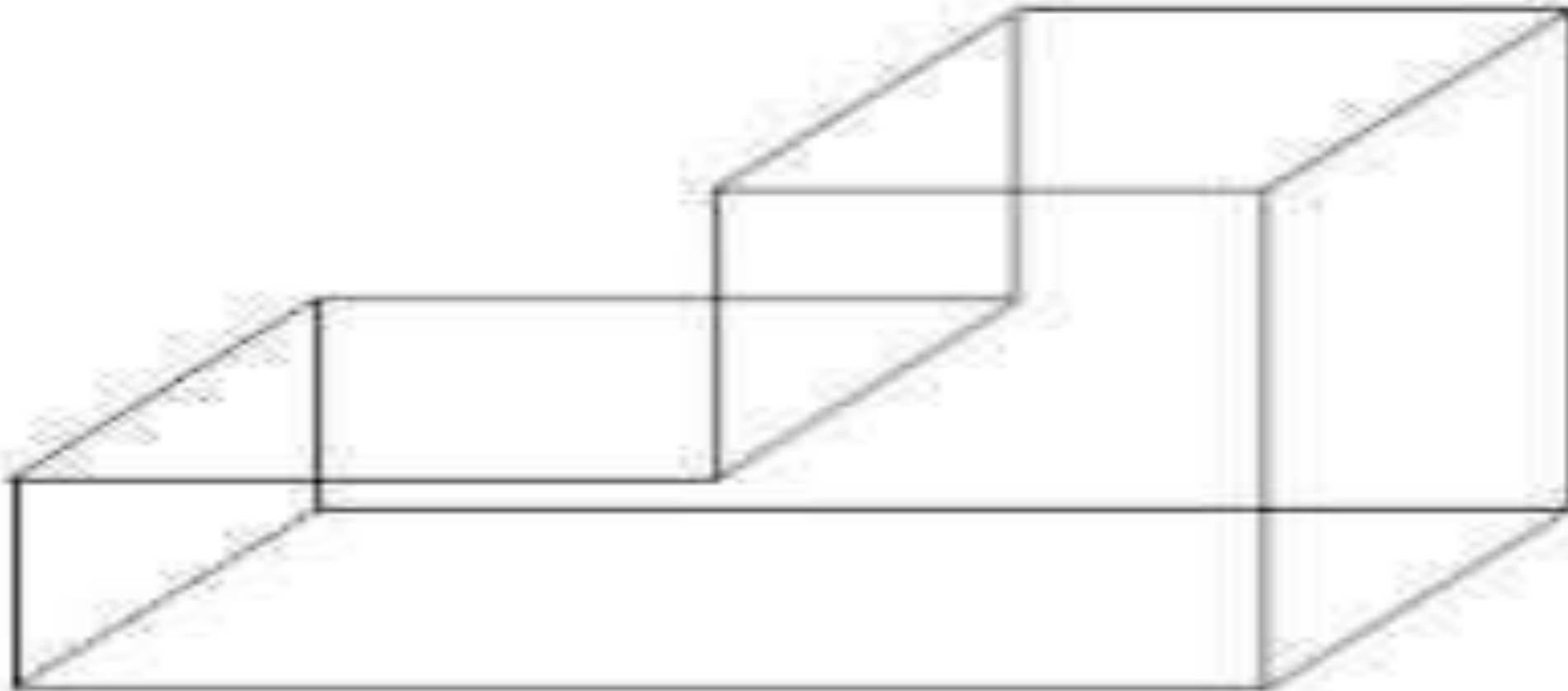


Fig 2.1 Wire frame model

Wireframe modeling - Advantages

- Can quickly and efficiently convey information than multi view drawings.
- Can be used for finite element analysis.
- Can be used as input for CNC machines to generate simple parts.
- Contain most of the information needed to create surface, solid and higher order models