


Computer Aided Design CAD

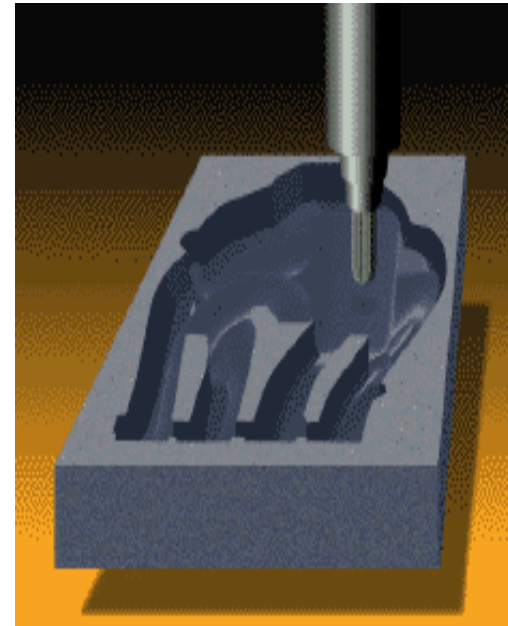
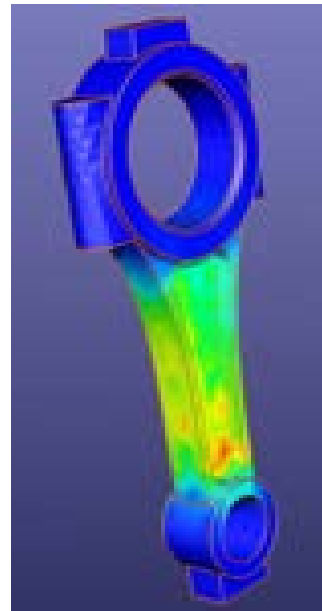
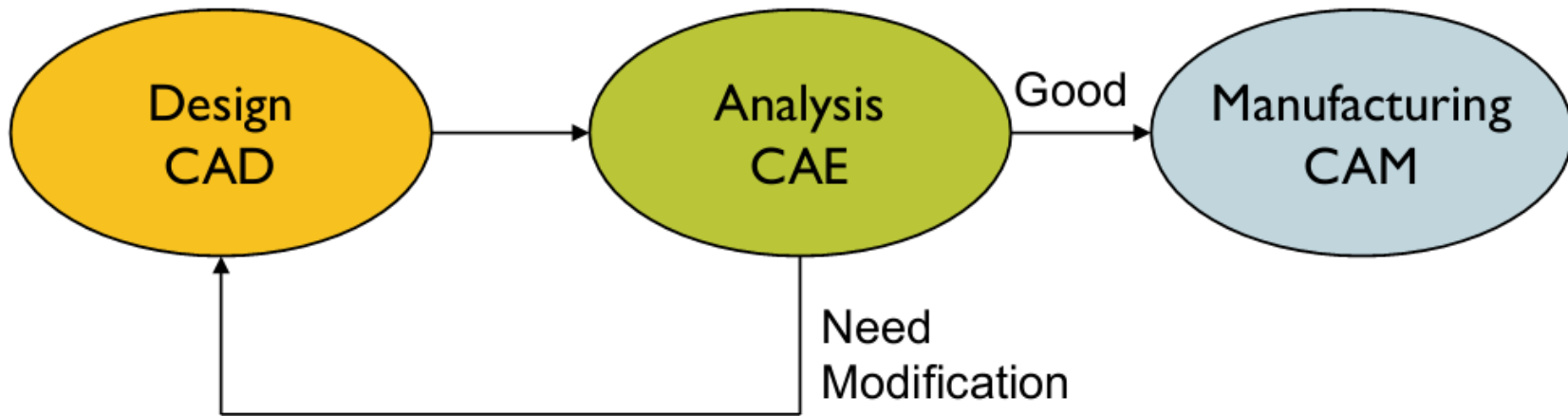


Computer Aided Design (CAD) is the technology concerned with the use of computer systems to assist in the creation, modification, analysis, and optimization of a design.

Computer Aided Manufacturing (CAM) is the technology concerned with the use of computer systems to plan, manage, and control manufacturing operations.

Computer Aided Engineering (CAE) is the technology concerned with the use of computer systems to analyze CAD geometry, allowing the designer to simulate and study how the product will behave.

CAD/CAE/CAM Product Lifecycle



Typical tools in CAD system

- Tolerance analysis.
- Mass property calculations: Surface area, Volume, Centroid of a volume, Center of surface area, Cross sectional area.
- Finite-element modeling and visualization.

A CAD system consists of three major parts:

- Hardware: computer and input/output devices.
- Operating system software.
- Application software: CAD package.

Hardware Components

➤ Input devices:

- Mouse
- Space ball
- Joystick
- Keyboard
- Digitizer

➤ Output devices:

- Plotters
- Color laser printers
- Disk (CD,DVD)
- Monitor



The diagram illustrates the flow of data into and out of a computer. A central blue box labeled 'Computer' is flanked by two columns of devices. On the left, under the 'Input' header, five blue arrows point towards the computer, labeled 'Mouse', 'Space ball', 'Joystick', 'Keyboard', and 'Digitizer'. On the right, under the 'Output' header, four blue arrows point away from the computer, labeled 'Plotters', 'Printers', 'Disk', and 'Monitor'. The 'Input' and 'Output' headers are enclosed in rounded rectangular boxes.

Input

Mouse

Space ball

Joystick

Keyboard

Digitizer

Computer

Output

Plotters

Printers

Disk

Monitor

Software Components

- **CAD** software allows the designer to create and manipulate a shape interactively and store it.
- **CAM** software plans, manages and controls the operations of a manufacturing site.
- **CAE** software analyzes design geometry, allowing designer to study product behavior.

Advantages of CAD/CAM systems

- ❖ Greater flexibility.
- ❖ Reduced lead times.
- ❖ Increased Productivity.
- ❖ Improved customer service.
- ❖ Improved quality.
- ❖ Better product design.
- ❖ Reduced costs.
- ❖ Reduction of machine tools.
- ❖ Less floor space.