Unit – 5

Computer Integrated Manufacturing (CIM)

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Recap

- Computer Hardware
- Principle of Computer Graphics
- CNC Machine Tools
- Group Technology and FMS

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Lecture Objectives

- Introduction to Computer Integrated Manufacturing (CIM)
- Potential Benefits of CIM
- Role of Computer in Manufacturing
- Manufacturing Method
- Subsystems in computer integrated manufacturing
- Technologies in CIM

Video Clips for Visualization

Introduction

•"CIM is the integration of the total manufacturing enterprise through the use of integrated systems and data communications coupled with new managerial philosophies that improve organizational and personnel efficiency."

•Computer-integrated manufacturing (CIM) is the manufacturing approach of using computers to control the entire production process.

Introduction

•CIM is the integration of all enterprise operations and activities around a common corporate data repository.

•It is the use of integrated systems and data communications coupled with new managerial philosophies.

•CIM is not a product that can be purchased and installed.

•It is a way of thinking and solving problems.

•This integration allows individual processes to exchange information with each other and initiate actions.

Potential Benefits of CIM

- Improved customer service
- Improved quality
- Shorter time to market with new products
- Shorter flow time
- Shorter vendor lead time
- Reduced inventory levels
- Improved schedule performance
- Greater flexibility and responsiveness
- Improved competitiveness
- Lower total cost
- Shorter customer lead time
- Increase in manufacturing productivity
- Decrease in work-in process inventory

Role of Computer in Manufacturing

The computer has had a substantial impact on almost all activities of a factory.

The operation of a CIM system gives the user substantial benefits:

- Reduction of design costs by 15-30%;
- Reduction of the in-shop time of a part by 30-60%;
- Increase of productivity by 40-70%;
- Better product quality, reduction of scrap 20-50%.

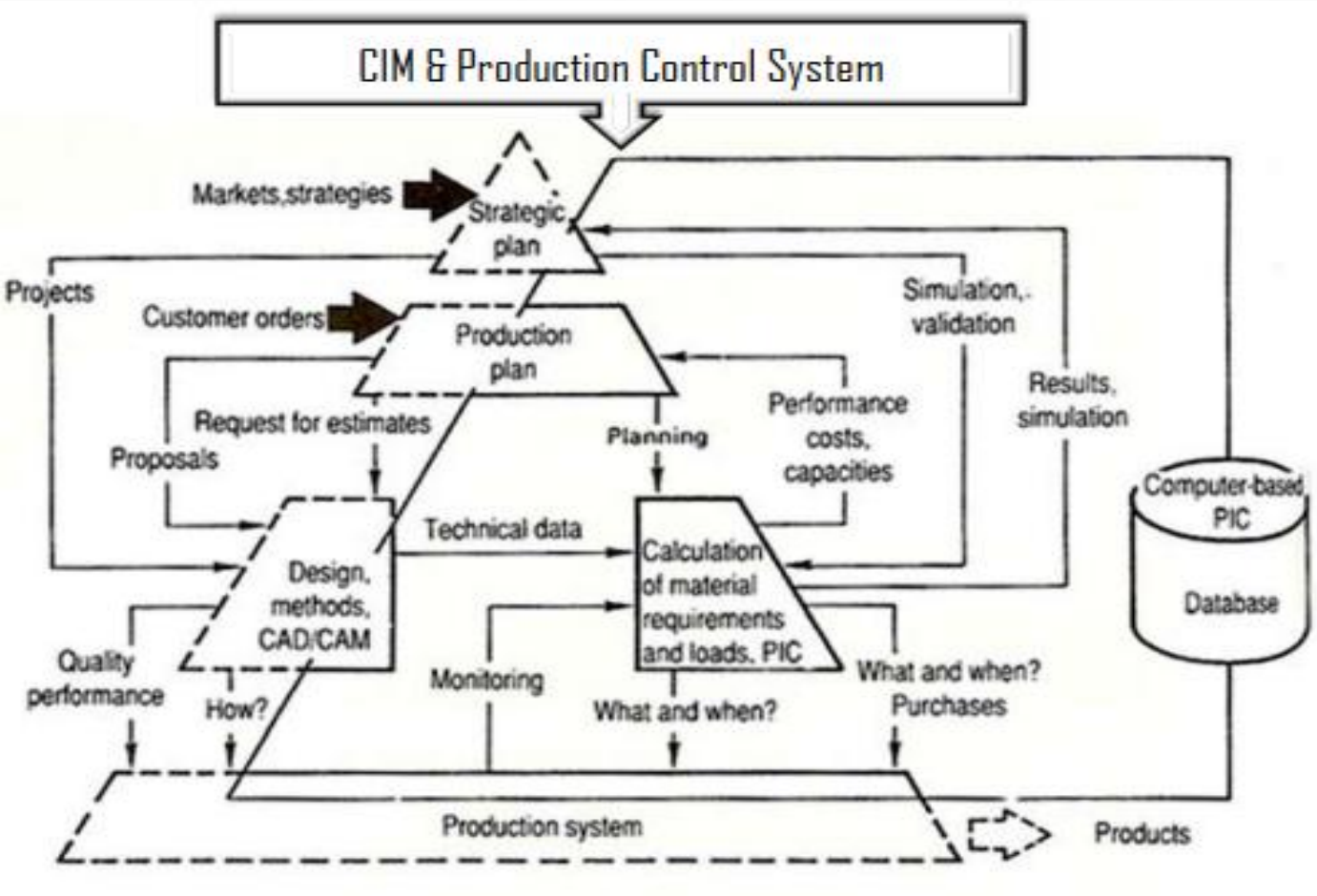
Manufacturing Method

As a method of manufacturing, three components distinguish CIM from other manufacturing methodologies:

- Means for data storage, retrieval, manipulation and
- presentation;
- Mechanisms for sensing state and modifying processes;
- Algorithms for uniting the data processing component with the sensor/modification component.
- CIM is an example of the implementation of **Information and Communication Technologies**(ICTs)in manufacturing.

School of Mechanical Engineering

Course Code : BAUT4001 **Course Name: CAD/CAM**



Name of the Faculty: Mr. Shrikant Vidya **Program Name: B.Tech (ME)**

Subsystems in computer Integrated Manufacturing

•**CAD (Computer-Aided Design)** involves the use of computers to create design drawings and product models.
•**CAE (Computer-Aided Engineering)** is the broad usage of computer software to aid in engineering tasks .
•**CAM (Computer-Aided Manufacturing)** is the use of computer software to control machine tools and related machinery in the manufacturing of work pieces.
•**CAPP (Computer-Aided Process Planning)** is the use of computer technology to aid in the process planning of a part or product, in manufacturing
•**CAQ (Computer-Aided Quality Assurance)** is the engineering application of computers and computer controlled machines for the inspection of the quality of products.
•**PPC (Production Planning and Control)** A production (or manufacturing) planning and control (MPC) system is concerned with planning and controlling all aspects of manufacturing, including materials, scheduling machines and people, and coordinating suppliers and customers.
•**ERP (Enterprise Resource Planning)** systems integrate internal and external management information across an entire organization, embracing finance/accounting, manufacturing, and sales and services.

Technologies in CIM

1. ASRS (Automated Storage and Retrieval System)
2. AGV (Automated Guided Vehicle)
3. Automated conveyance systems & Robotic

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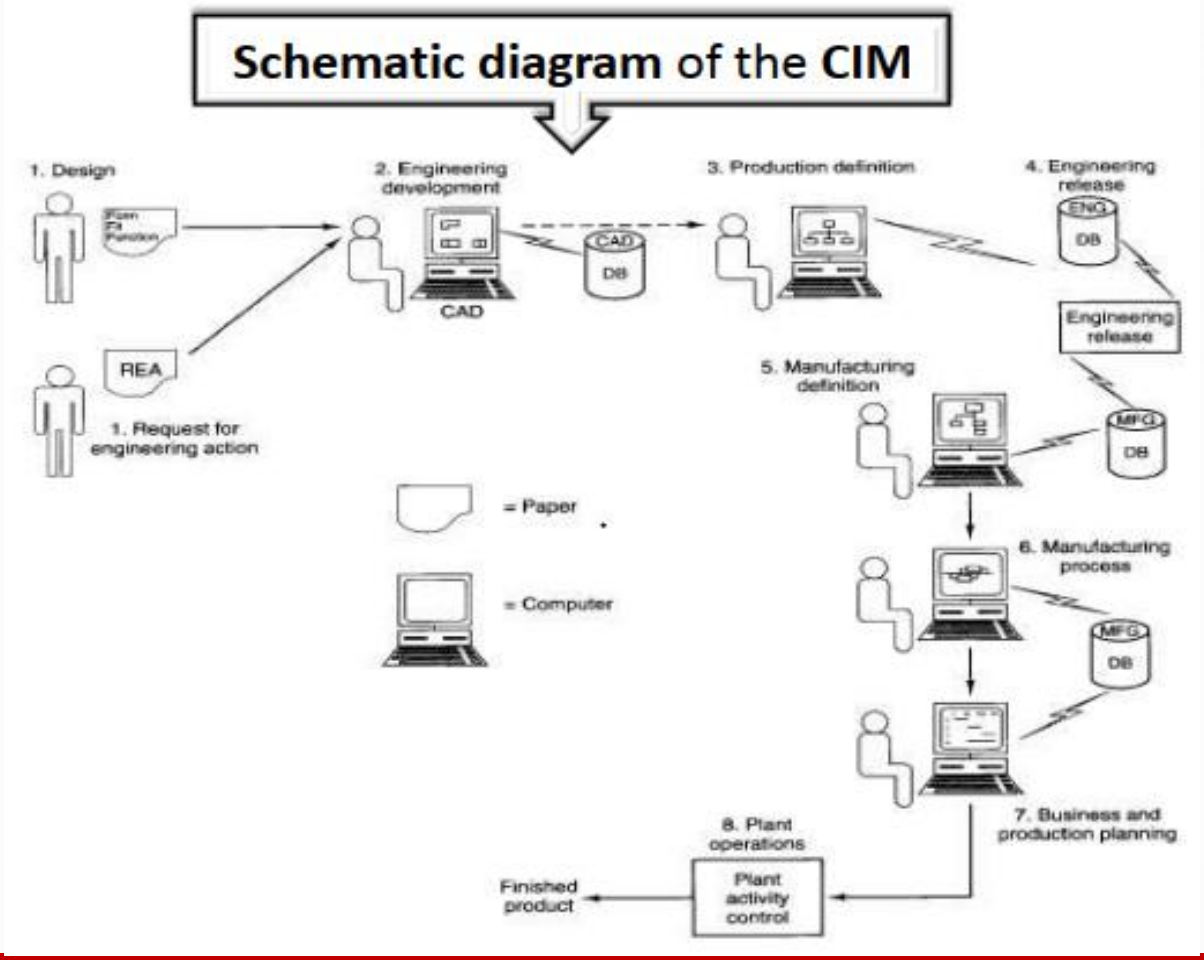

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Summary

•**Computer-integrated manufacturing** (**CIM**) is the manufacturing approach of using computers to control the entire production process.

•This integration allows individual processes to exchange information with each other and initiate actions.

•Through the integration of computers, manufacturing can be faster and less error-prone, although the main advantage is the ability to create automated manufacturing processes.

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List the advantages and disadvantages of CIM