CAM

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History and Future trend in Automation Product Cycle

Historical development and future trends

- *Wheel around 3200 B.C.*

- Lever winch around 600 B.C.
- Screw and Gear around 1405 A.D.
- Waterwheel and Windmills around 650 A.D.

- *Steam Engine 1765*
- Flour mills(Around 85 B.C.),Weaving Machines(1733),boring mill(1775),steam boat(1787) and railroad locomotives(1803)

Fly ball governor (1785)

Jacquard loom around 1800

Around 1800 the basic element of automated systems:

- Power
- Control
- Programmable machines

Were developed which are primitive in nature after that many year required for refinement

- Important improvement:

  - Interchangeable parts around 1800
  - Electrification 1881
  - Moving assembly line 1913
  - A mathematical Theory of control system after 1930
  - **MARK I Computer at Harvard University 1944**

  Note: These invention and development had gained important by the end of World War II

- **First Numerical control machine is demonstrated at MIT 1952**
- **First Commercial Personal Computer 1978 by Apple Computer**

- Computer Technology development is possible by advances in electronics
  - Transistor 1948
  - Hard disk for computer memory 1956
  - Integrated Circuits 1960
  - Microprocessor 1971
  - RAM 1984
  - Pentium Microprocessor 1993

On software side
  - FORTRAN Computer programming language 1955
  - APT Programming Language for Numerical Control(NC) 1961
  - UNIX operating system 1969
  - VAL language for robot Programming 1979
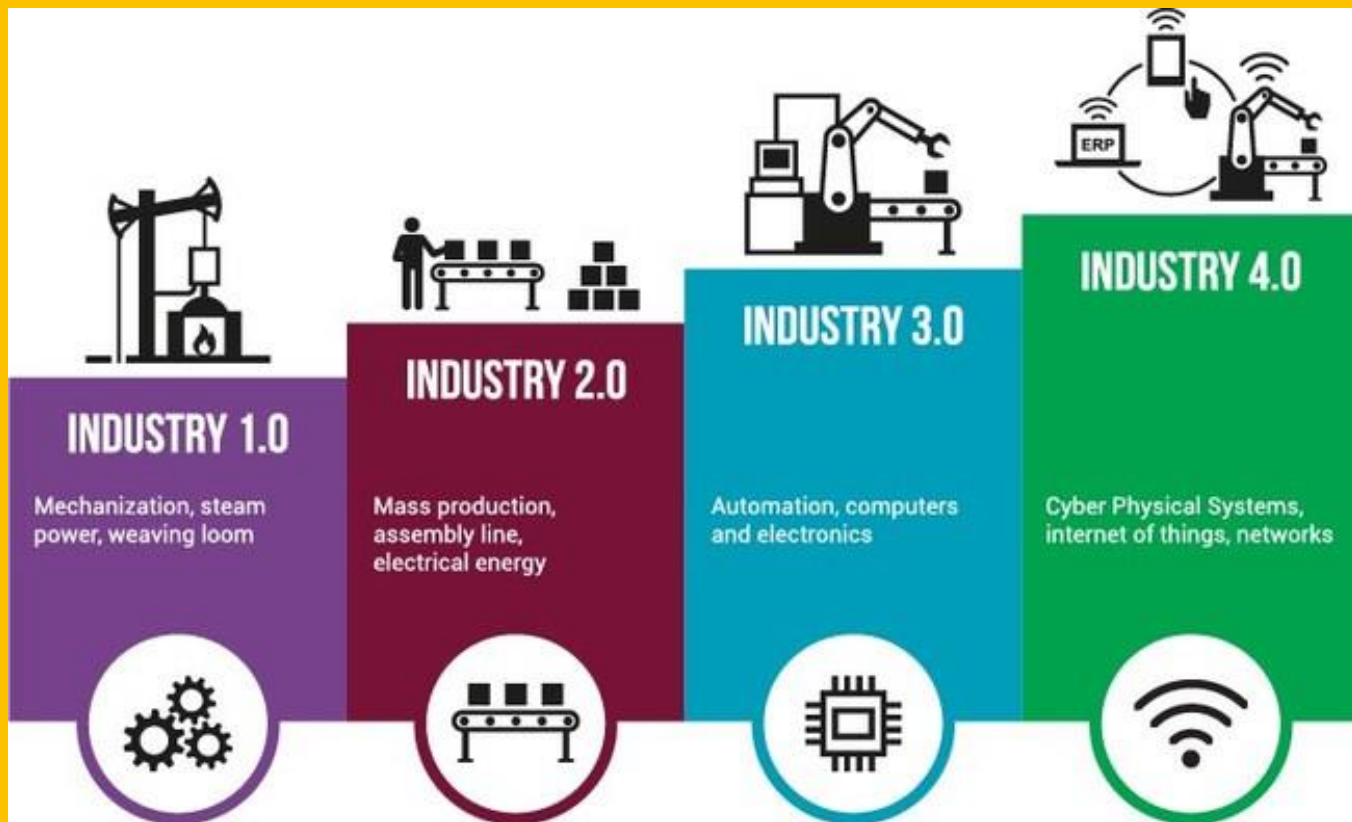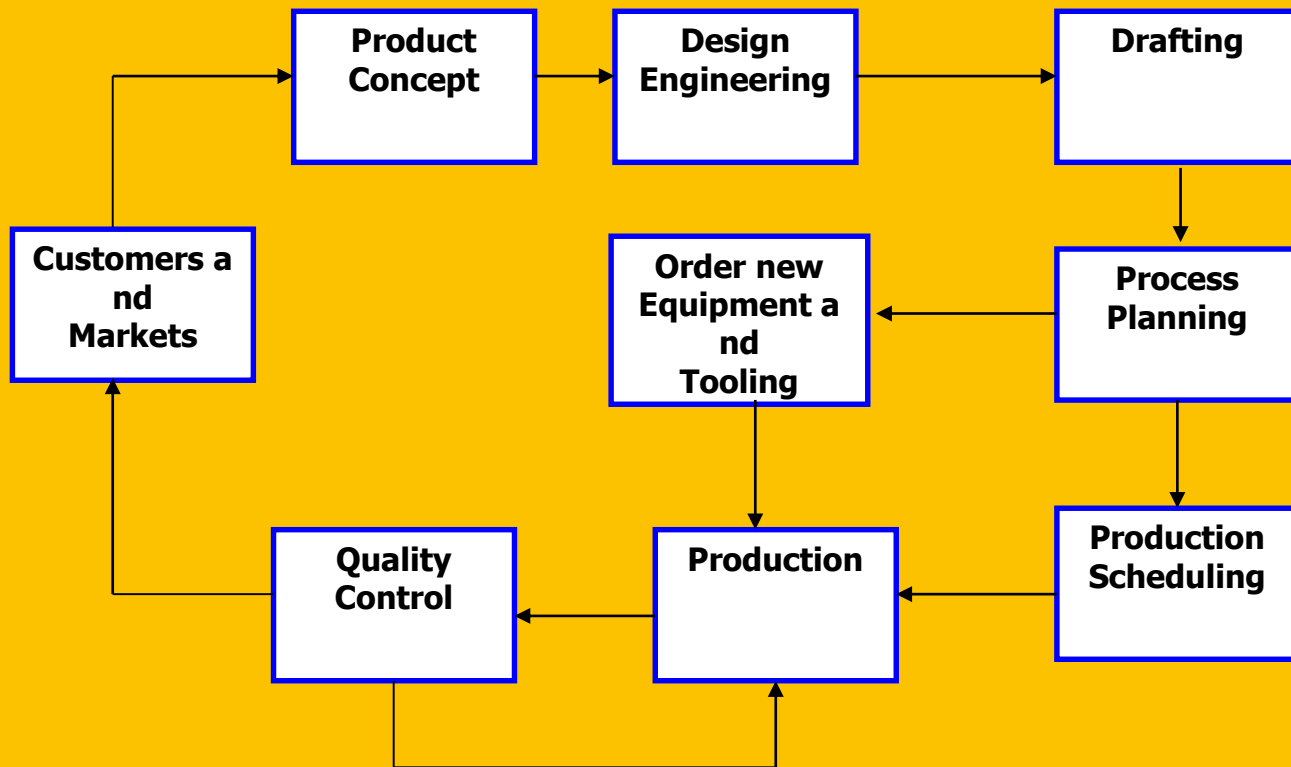 - Microsoft window 1985
  - JAVA Programming language 1995

Artificial **intelligence**

Robotics

Internet of Things

Product Cycle


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Customers and Markets → Product Concept → Design Engineering → Drafting
                                                                    ↓
Quality Control ← Production ← Production Scheduling ← Process Planning ← Order new Equipment and Tooling ← Process Planning
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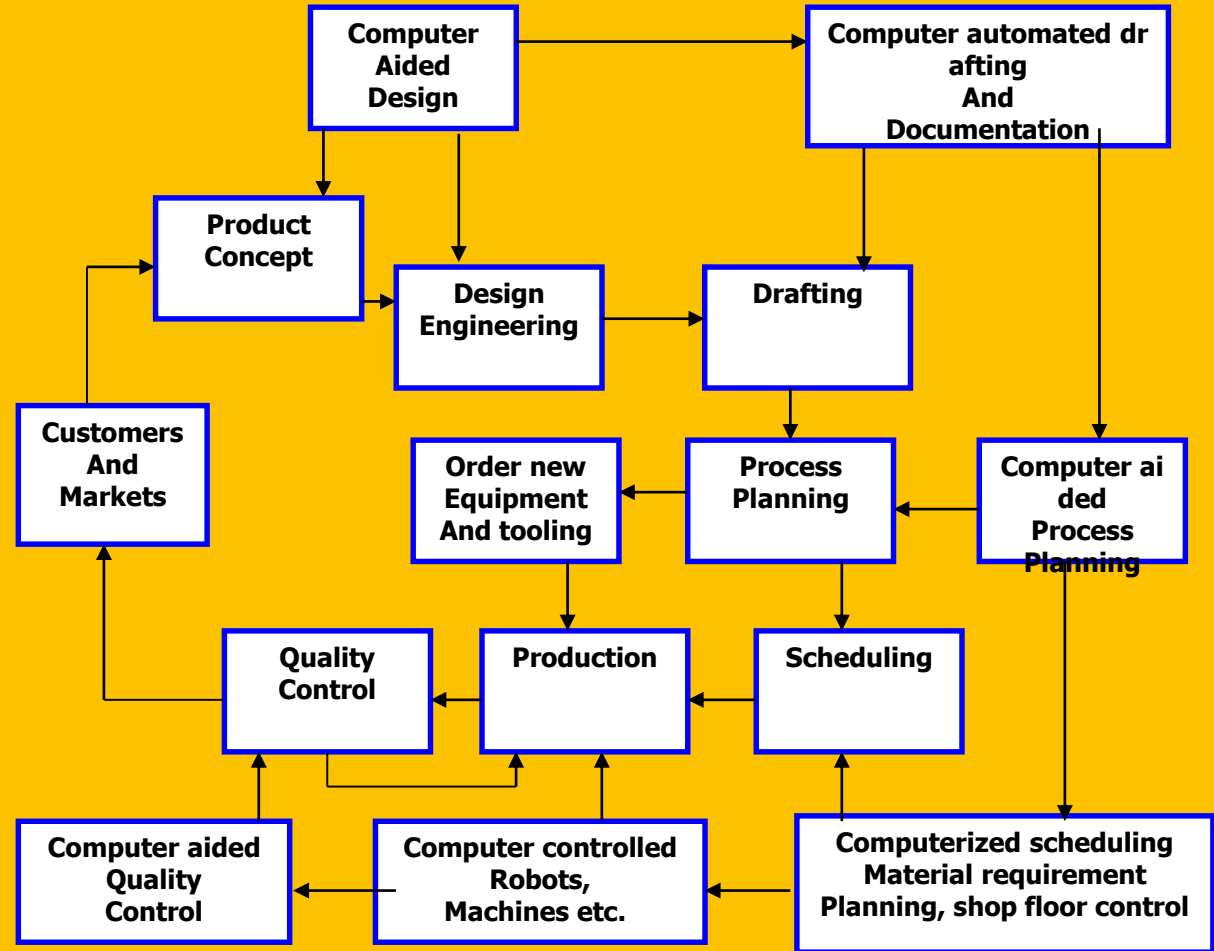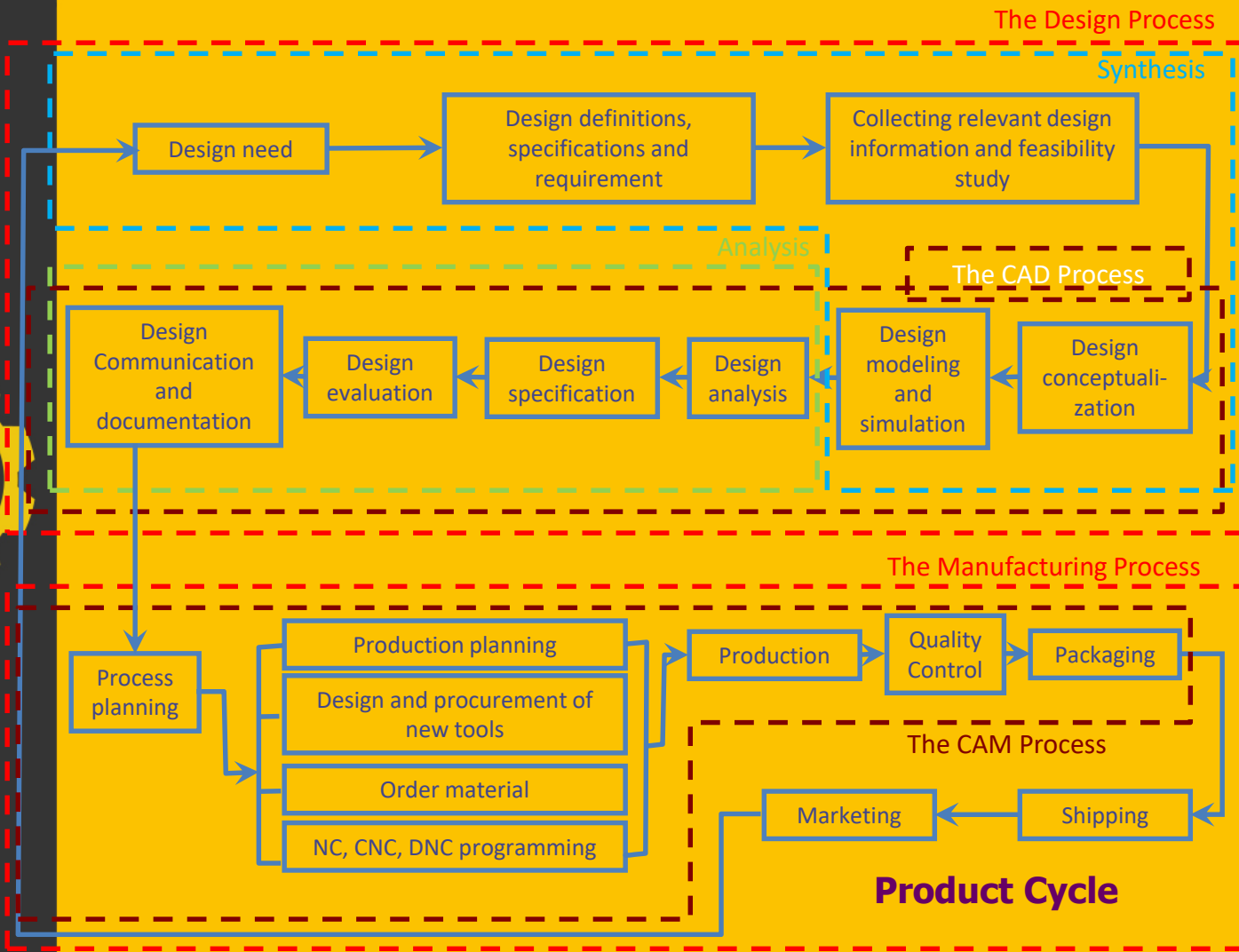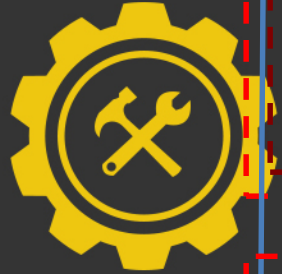
Product cycle revised with CAD/CAM overlaid

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Thank You