Industrial Automation
Introduction

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COURSE OBJECTIVES

- To show the importance of information and control in the context of industrial production, mainly in relationship to manufacturing
- To describe methods and tools to support information and control in such a context

COURSE CONTEXT

Ideal world where imperfections, if taken into account, are statistically evalueted

PLANNING (MRP, MRPII, ERP)

EXECUTION (MES)

CONTROL (PLC, SCADA, ...)

MPS, BOM, Inventory

On-line scheduling

Process

Statistical data

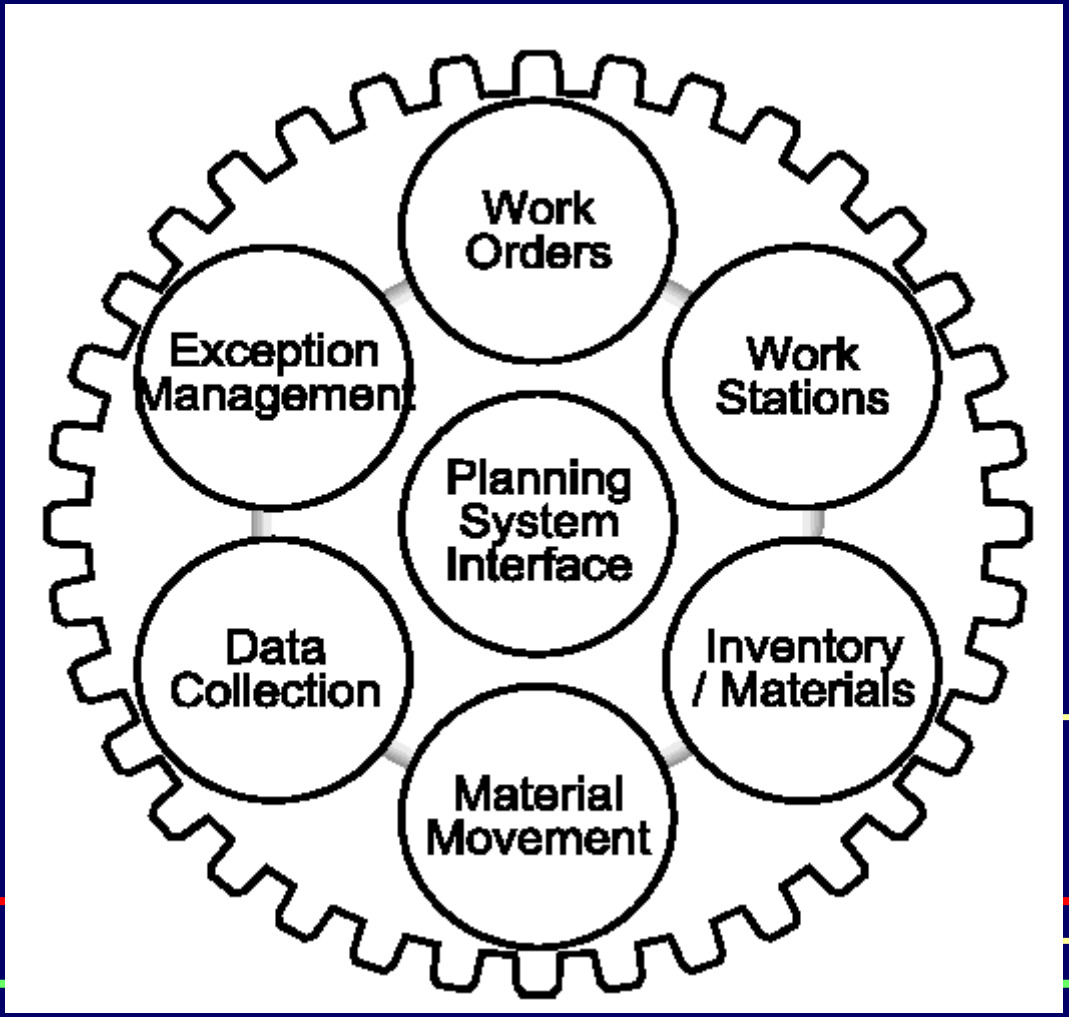
Process status

HW alarms, Data process

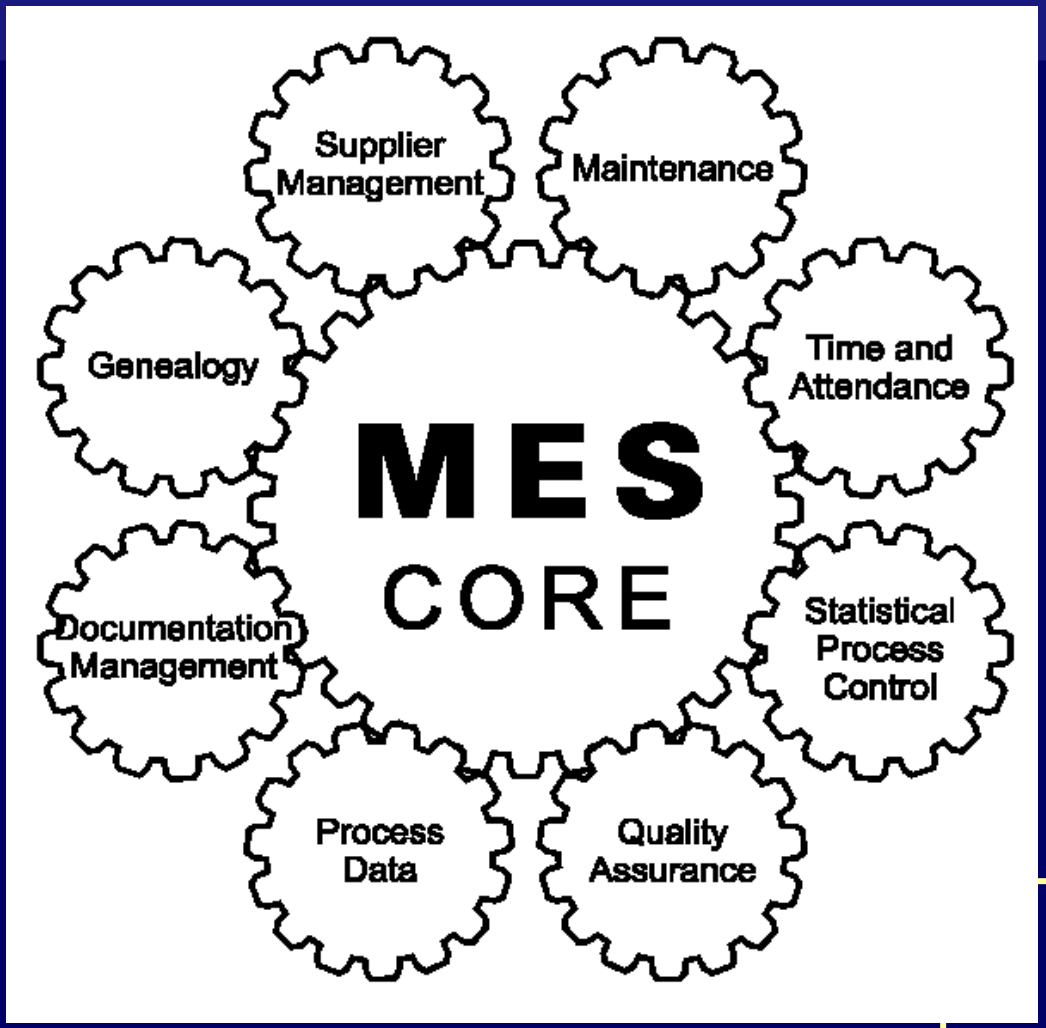
Shopfloor

Real world were imperfections and unforeseen events are present

MES (MANUFACTURING EXECUTION SYSTEM) PRIMARY FUNCTIONS



MES SUPPORT FUNCTIONS



COURSE PROGRAM (1/5)

- Introduction to production systems
  - Exercises: Introduction to Matlab
- Shopfloor description and examples

COURSE PROGRAM (2/5)

- Field Level and Direct Control (SCADA, PLC, ...)
  - Generate Ladder Logic Diagrams
  - Exercises in Matlab:
    - Control of basic discrete time systems (eg. a tank level)
      - LQ, LQ tracking, PID

COURSE PROGRAM (3/5)

- MES Primary functions
  - Exercises in Matlab:
    - Scheduling
    - Statistical process control
- MES support functions

COURSE PROGRAM (4/5)

- MRP (Material Requirement Planning)
- MRPII (Manufacturing Resources Planning)
- ERP (Enterprise Resource Planning)
- Exercises in mathematical programming on production planning

COURSE PROGRAM (5/5)

- Use Case
  - Industrial partner platforms and case studies for industrial automation