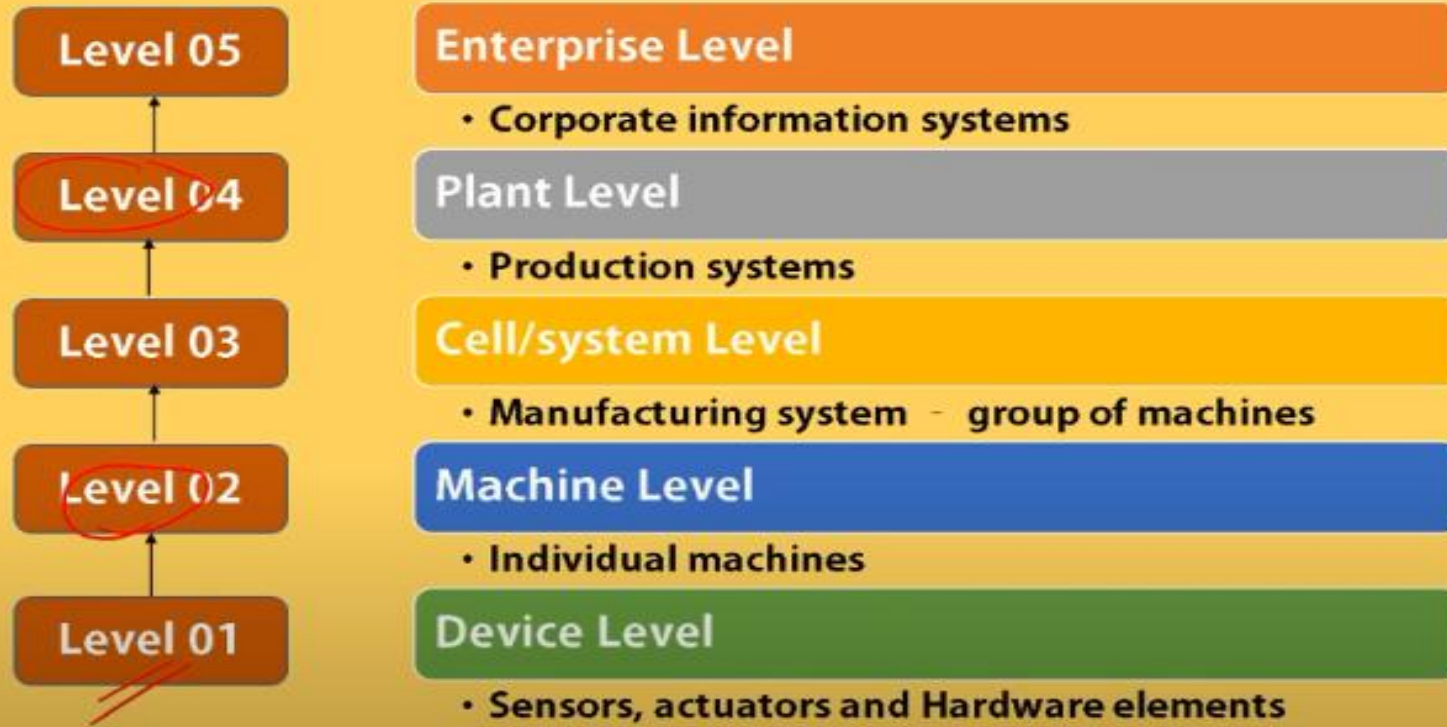## DEPARTMENT OF MECHANICAL ENGINEERING
19MEB204 IoT FOR PRODUCTION SYSTEM

TOPIC – Levels of Automation

Levels of Automation

Levels of Automation

- Level 05 — **Enterprise Level**
  - Corporate information systems
- Level 04 — **Plant Level**
  - Production systems
- Level 03 — **Cell/system Level**
  - Manufacturing system – group of machines
- Level 02 — **Machine Level**
  - Individual machines
- Level 01 — **Device Level**
  - Sensors, actuators and Hardware elements
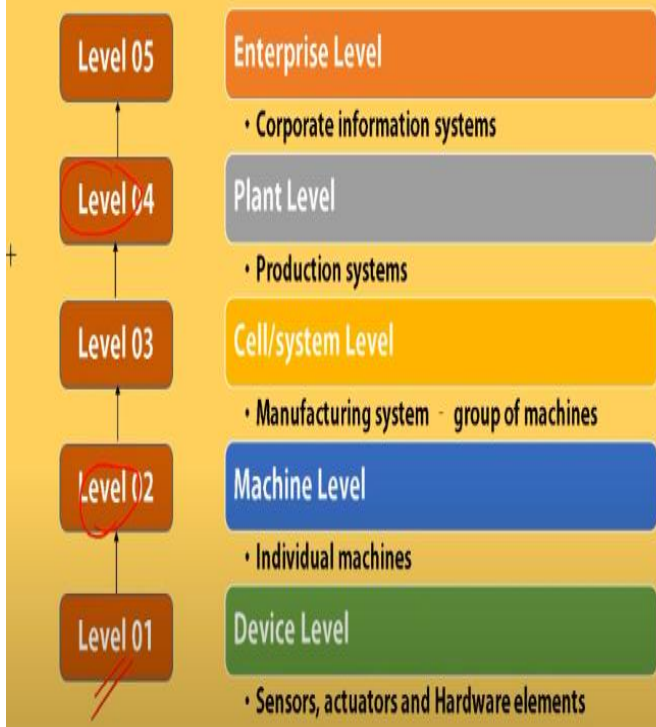
Device level

- This is the lowest level in our automation hierarchy.
- It includes the **actuators, sensors, and other hardware components** that comprise the machine level.
- The devices are combined into the individual control loops of the machine; for example, the feedback control loop for one axis of a CNC machine or one joint of an industrial robot.

Levels of Automation

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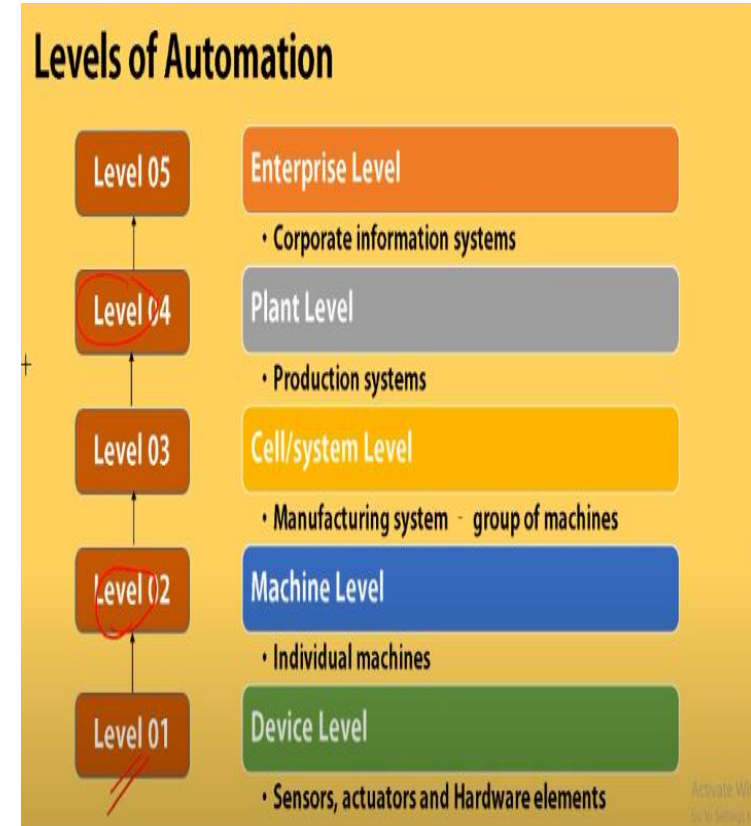- Sensors, actuators and Hardware elements

Levels of Automation

Machine Level

- Hardware at the device level is assembled into individual machines.
- Examples include **CNC machine tools and similar production equipment, industrial robots, powered conveyors, and automated guided vehicles.**
- Control functions at this level include performing the sequence of steps in the program of instructions in the correct order and making sure that each step is properly executed.

Levels of Automation

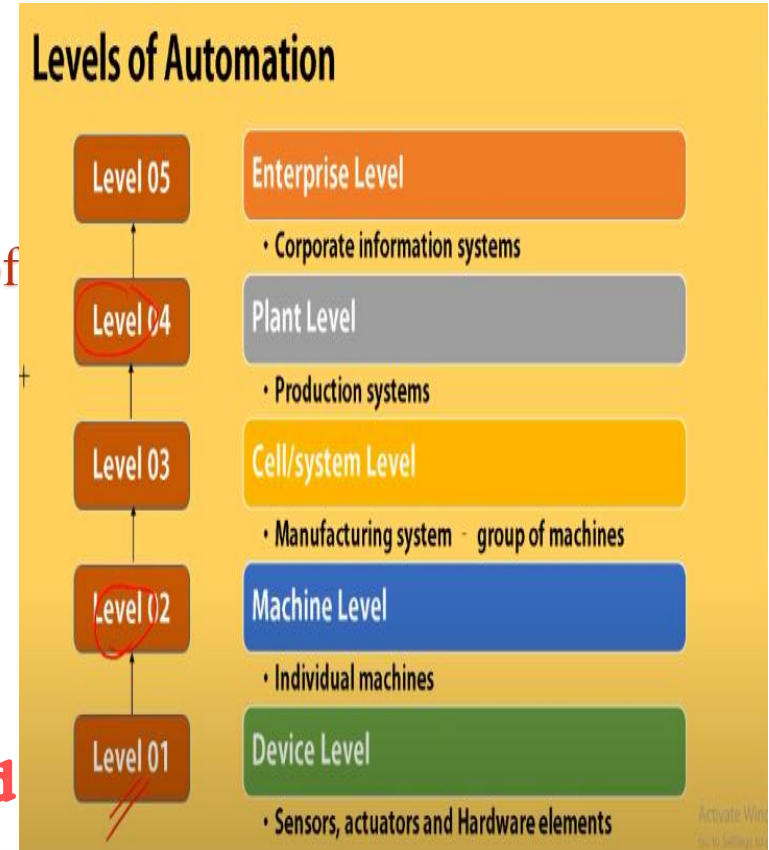| Level 05	Enterprise Level
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Cell or system level

- This is the manufacturing cell or system level, which operates under instructions from the plant level.
- A manufacturing cell or system is a group of machines or workstations connected and supported by a material handling system, computer. and other equipment appropriate to the manufacturing process.
- Production lines arc included in this level. functions include part dispatching and machine loading. coordination among machines and material handling system, and collecting and cvaluatinginspection data.

Levels of Automation

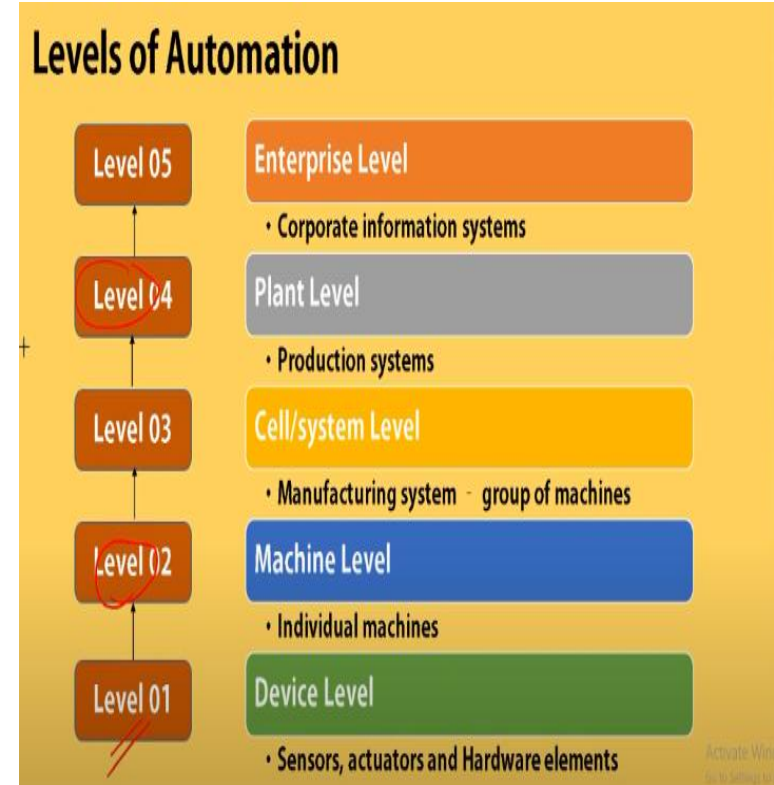| Level 05	Enterprise Level
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Plant level

This is the factory or production systems level.

It receives instructions from (he corporate information system and translates them into operational plans for production.

Likely functions include: **order processing, process planning, inventory control, purchasing, material requirements planning, shop floor control, and quality control.**

Levels of Automation

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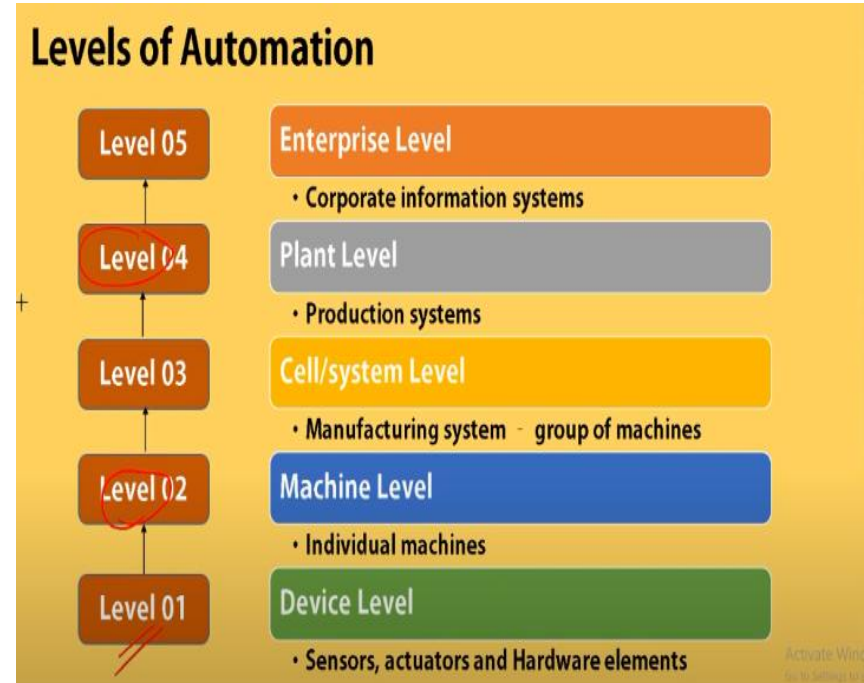 - Sensors, actuators and Hardware elements

Levels of Automation

Enterprise level

- This is the highest level.consisting of the corporate information systern.

- It is concerned with all of the functions necessary to manage the company: **marketing and sales, accounting, design, research, aggregate planning, and master production scheduling.**

Levels of Automation

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THANKS!

IoTPS/DIVYAKUMAR P/MECH/SNSCT