BITS Pilani
presentation

BITS Pilani
Pilani Campus

Dr. Nagesh BS

SE ZG501
Software Quality Assurance and Testing
Lecture No. 12

CMMI

Level 1: Initial (Ad Hoc)

The company decides to build a banking app.

- Developers start coding without planning.

- No timelines or quality checks.

- Features change often; bugs appear late.

- The project is delayed and over budget.

Level 2: Repeatable (Basic Project Management)

After struggling with the first version, the team creates a basic checklist.

- They use past project timelines to plan the next version.

- Some steps (e.g., testing and deployment) are reused from previous success.

- Delivery is more controlled, but only for similar projects.

CMMI

Level 3: Defined (Standardized Process)

The company documents a full app development lifecycle.

- All teams use a defined process: planning → design → coding → testing → review.
- Everyone follows the same process with some tailoring for specific needs.

Level 4: Managed (Quantitative Control)

The company now tracks key metrics:

- Bug count, response time, test coverage, customer feedback.
- They set quality thresholds (e.g., < 5 bugs per release).
- Deviations trigger corrective action before release.

Level 5: Optimizing (Continuous Improvement)

The team reviews all project data.

- They notice manual testing is slow → they test automated tools.
- A pilot project shows 30% faster testing and fewer bugs.
- Automation is adopted company-wide to optimize quality and speed.
- They regularly experiment with new ideas based on data.

KPA Diagram (CMMI Structure)

1. **Maturity Levels**

2. → Indicate the **overall process capability** of an organization.

3. **Key Process Areas (KPAs)**
   → Each maturity level **contains** KPAs — groups of related activities that help improve processes.

4. **Goals**
   → Each KPA is designed to **achieve specific goals** that are important for process improvement.

5. **Common Features**
   → KPAs are **organized by common features** (like commitment, ability, and measurement).

6. **Implementation or Institutionalization**
   → Common features **address how to make processes part of daily work**, ensuring they are followed consistently.

Key Practices

→ Common features **contain key practices**, which are the **actual steps** or actions to perform.

Infrastructure or Activities

→ Key practices **describe the tools, training, or actions** needed to carry out the process eLectively.

KPA Areas in CMMI

1.Commitment

The organization shows strong **intent and responsibility** to perform the process.

Example: Management agrees to provide resources and support to implement quality standards.

2. Ability

The organization has the **resources, skills, and tools** needed to carry out the process.

Example: The team has trained staff and access to testing tools to conduct quality assurance.

3. Activity

The specific **steps or tasks** that must be carried out to implement the process. "#

Example: Conducting code reviews or documenting software requirements.

4. Measurement

The process is tracked using **metrics** to check performance and progress.

"# *Example:* Measuring the number of defects per module or average resolution time.

5. Verification

Ensuring that the **process** is followed correctly and meets its goals.

"# *Example:* Auditing project documents or conducting peer reviews to confirm process adherence.

THANK YOU