Process Improvement

UNIT-V

Attributes of a Process

Understandability	Visibility	Reliability	Supportability
Robustness	Acceptability	Reliability	Rapidity

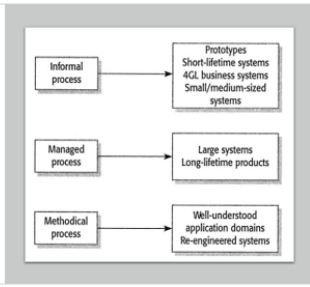
Process and Product Quality

- A fundamental assumption of quality management is that the quality of the development process directly affects the quality of delivered products.
- This assumption comes from manufacturing systems where product quality is intimately related the production process.
- There is a clear link between process and product quality in manufacturing because the process is relatively easy to standardize and monitor.
- Once manufacturing systems are calibrated, they can be run again and again to output high-quality products.
- Software development is a creative rather than a mechanical process, so the influence of individual skills and experience is significant.

Process Classification

- Software process classified in to four categories

1. Informal Process
2. Managed Process
3. Methodical Process
4. Improving Process



Process Measurement

- Process measurements are quantitative data about the software process.
- The measurement of process and product attributes is essential for process improvement.
- Measurement has an important role to play in small-scale, personal process improvement.
- Process measurements can be used to assess whether the efficiency of a process has been improved.
- For example, the effort and time devoted to testing can be monitored.
- Effective improvements to the testing process should reduce the effort, testing time or both.

Process Change

- Process change involves making modifications to the existing process. You may do this by introducing new practices, methods, or tools, by changing the ordering of process activities, by introducing or removing deliverables from the process, or by introducing new roles and responsibilities.

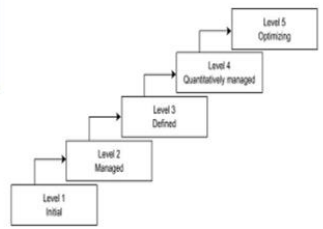
Five key stages in the process change process:

1)Improvement identification.
2)Improvement prioritizations.
3)Process changes introduction.
4)Process change training.
5)Change tuning.

The CMMI Process Improvement Framework

- The CMMI model is intended to be a framework for process improvement that has broad applicability across a range of companies.
- Its staged version is compatible with the Software CMM and allows an organization's system development and management processes to be assessed and assigned a maturity level from 1 to 5.

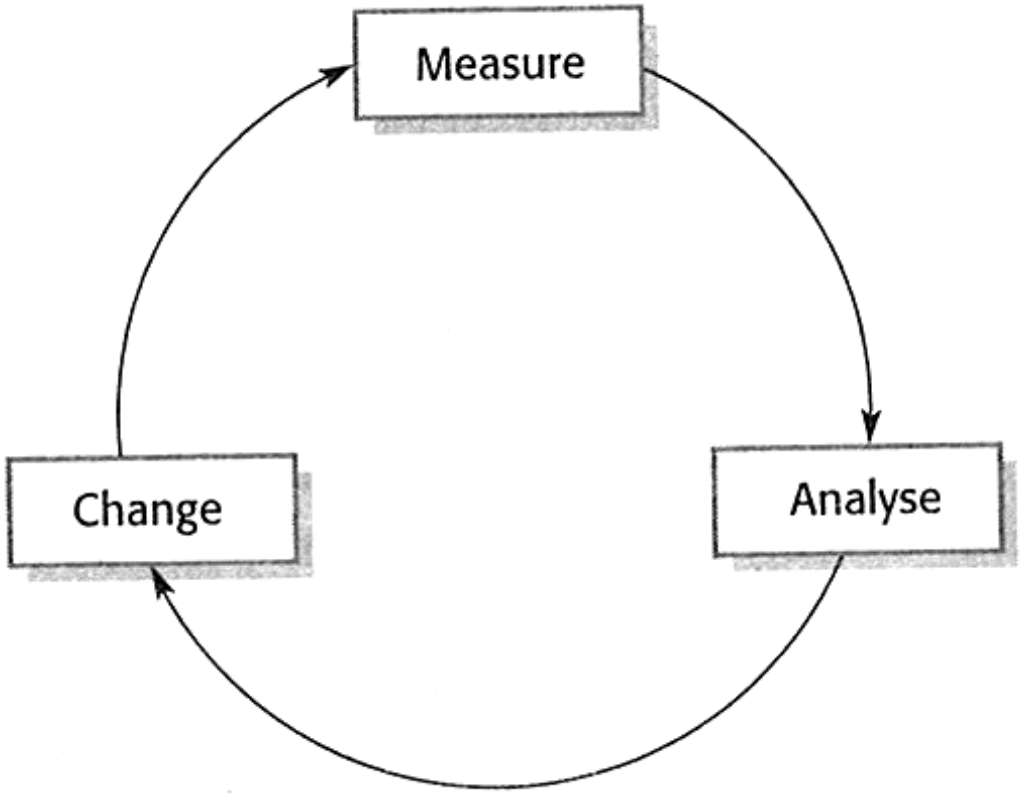
The staged CMMI model



Process Improvement

UNIT-V

Process Improvement Cycle



- Process improvement is a cyclical activity. It involves three principal stages.
- Process improvement is defined as the process of understanding existing process and changing the process to increase the product quality.

- Process improvement has three stages

1. Process Measurement
2. Process Analysis
3. Process change

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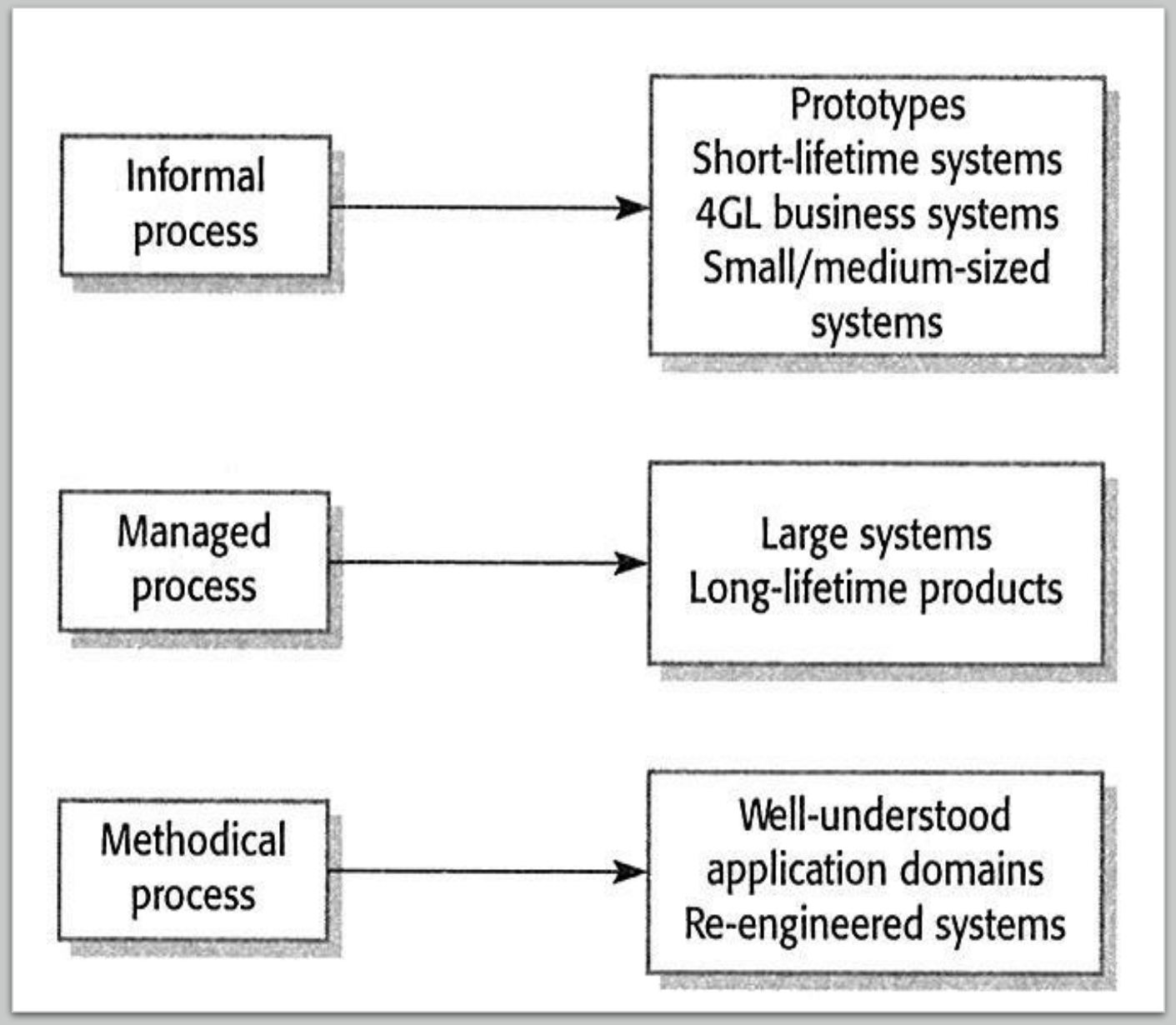

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Process Measurement- Three classes

- **Three classes of process metric can be collected:**
- **1)The time taken for a process to be completed**. This can be the total time devoted to the process, calendar time, the time spent on the process by engineers.
- **2)The resources required for a process.** The resources might include total effort in person-days, travel costs and computer resources.
- **3)The number of occurrences of an event**. Examples of events that might be monitored include the number of defects discovered during code inspection, the number of requirements changes requested and the average number of lines of code modified in response to a requirement change.

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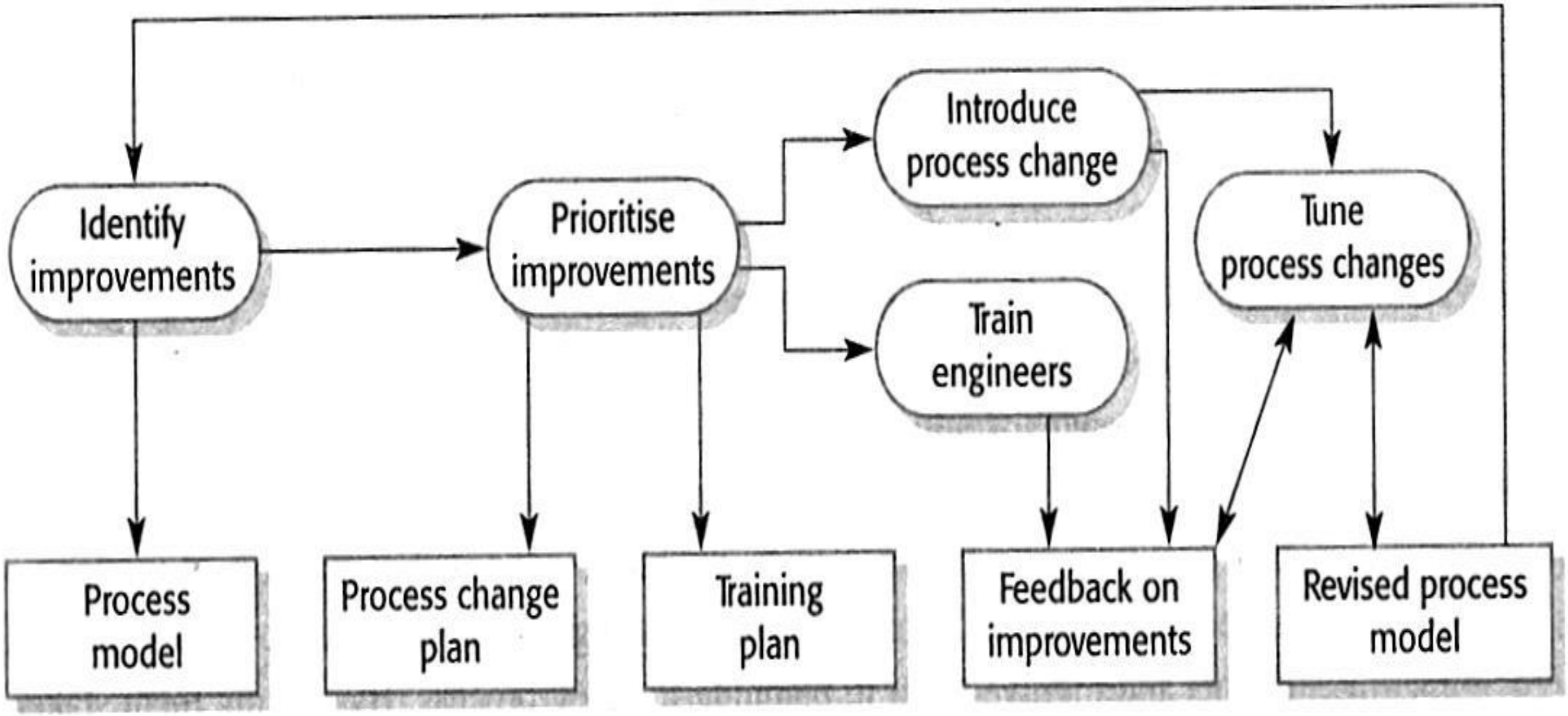

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A CMMI assessment involves a six-point scale

- A CMMI assessment involves a six-point scale that relates to the level of maturity in each process area.

1. Incomplete: At least one of the specific goals associated with the process area is not satisfied. There are no generic goals at this level as institutionalization of an incomplete process does not make sense.

2. Performed: The goals associated with the process area are satisfied, and for all processes the scope of the work to be performed is explicitly set out and communicated to the team members.

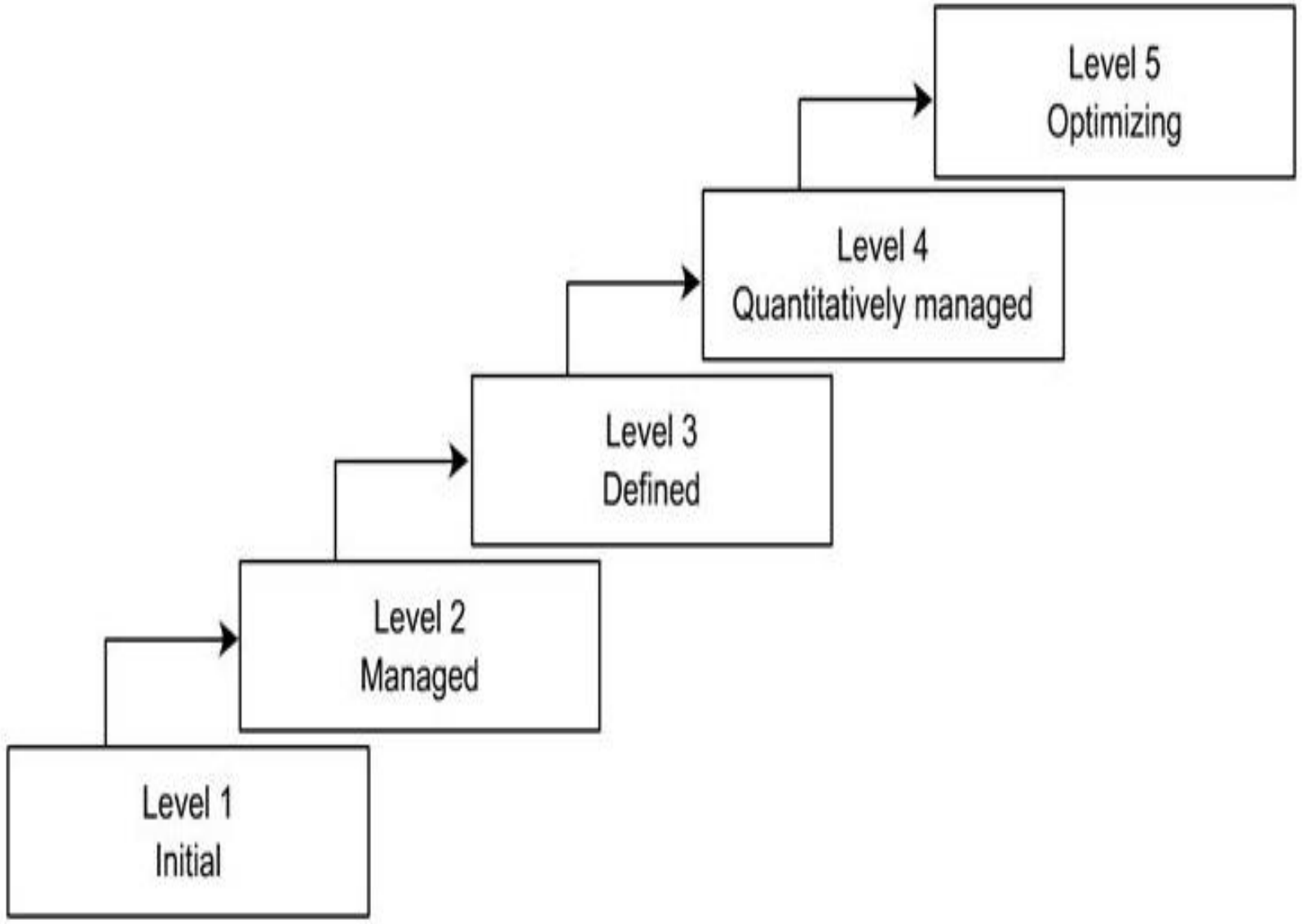
3. Managed: At this level, the goals associated with the process area are met and organizational policies are in place that define when each process should be used. There must be documented project plans that define the project goals. Resource management and process monitoring procedures must be in place across the institution.

4. Defined: This level focuses on organizational standardization and deployment of processes. Each project has a managed process that is adapted to the project requirements from a defined set of organizational processes. Process assets and process measurements must be collected and used for future process improvements.

5. Quantitatively: managed at this level, there is an organizational responsibility to use statistical and other quantitative methods to control subprocesses; that is, collected process and product measurements must be used in process management.

6. Optimizing: At this highest level, the organization must use the process and product measurements to drive process improvement. Trends must be analyzed, and the processes adapted to changing business needs.

The staged CMMI model



The staged CMMI model

1. Requirements management Manage the requirements of the project's products and product components and identify inconsistencies between those requirements and the project's plans and work products.

2. Project planning Establish and maintain plans that define project activities.

3. Project monitoring and control Provide understanding into the project's progress so that appropriate corrective actions can be taken when the project's performance deviates significantly from the plan.

4. Supplier agreement management Manage the acquisition of products and services from suppliers external to the project for which a formal agreement exists.

5. Measurement and analysis Develop and sustain a measurement capability that is used to support management information needs.

6. Process and product quality assurance Provide staff and management with objective insight into the processes and associated work products.

7. Configuration management Establish and maintain the integrity of work products using configuration identification, configuration control, configuration status accounting, and configuration audits.