

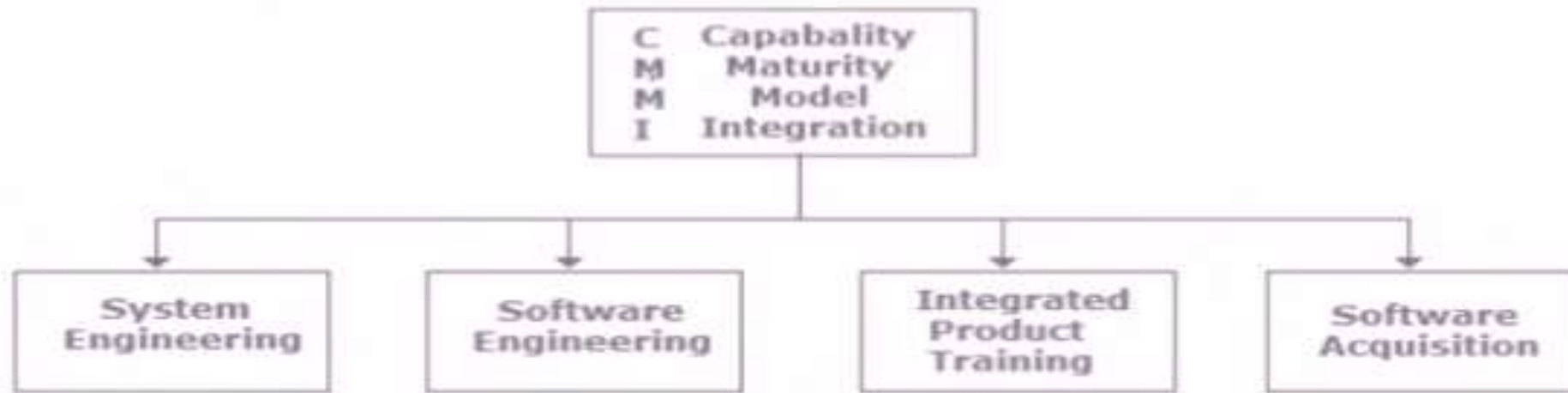
# Capability Maturity Model Integration (CMMI)



# CMMI-Definition

- ▶ CMMI stands for Capability Maturity Model Integration.
- ▶ Its is a process improvement approach that provides companies with the essential elements of an effective process.
- ▶ It is a good guide for process improvement across a project or organization.
- ▶ CMMI is formed by using multiple CMM processes.

# AREAS IN WHICH CMMI ADDRESSES



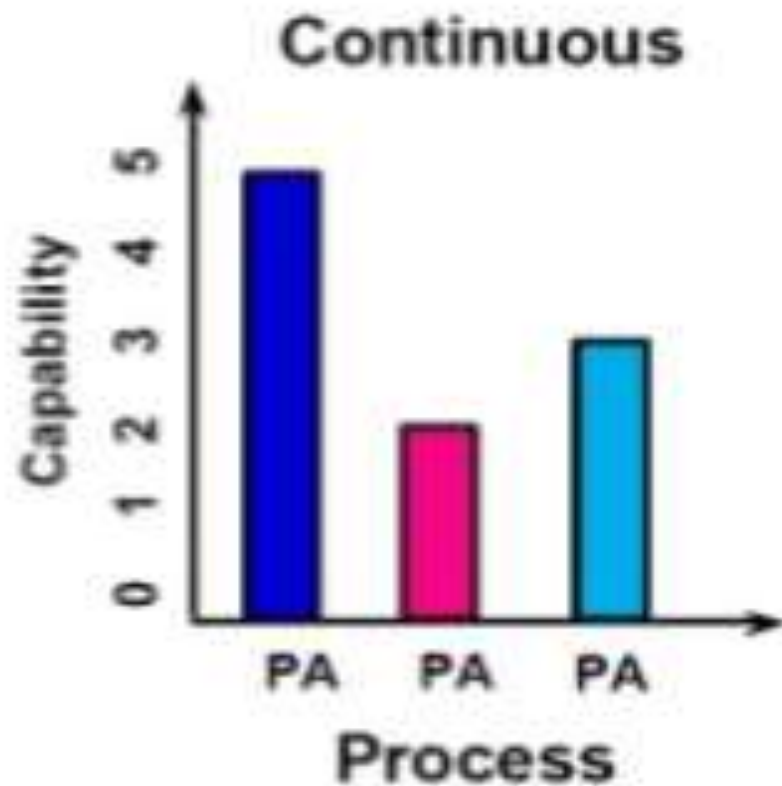
# STRUCTURE OF CMMI MODEL

- ▶ The basic building blocks in every CMMI model are called “ process areas ”
- ▶ A process area describes what those using an effective process do (practices) and why they do those things (goals).

# CMMI MODEL REPRESENTATION

- ▶ Process areas can be organized into one of two representations.
  - Continuous representation
  - Staged representation

# CMMI MODEL REPRESENTATION



# STAGED REPRESENTATION

**Staged representation** uses maturity levels to measure process improvement.

- ▶ Pre-defined sets of process areas define an improvement path for the organization.
- ▶ Group of process areas
- ▶ Maturity levels range from 1 to 5
- ▶ Maturity Levels apply to an organization's overall maturity

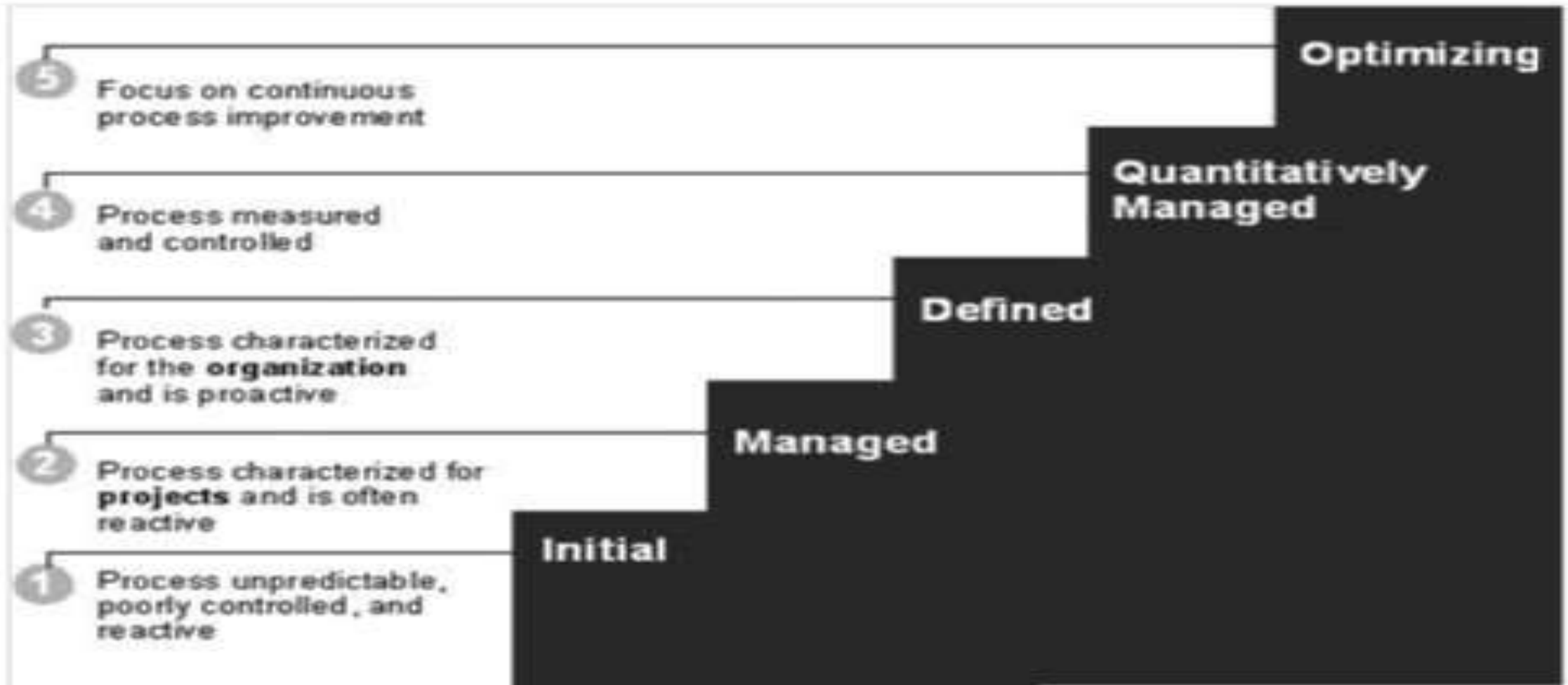
# CONTINUOUS REPRESENTATION

**Continuous representation** uses capability levels to measure process improvement.

- ▶ Continuous Staged Provides maximum flexibility for focusing on specific process areas according to business goals and objectives
- ▶ Capability levels:
  - Measure maturity of a particular process across an organization.
  - Range from 0 through 5



# MATURITY LEVELS IN STAGED REPRESENTATION



## MATURITY LEVEL 1 (INITIAL)

- ▶ At maturity level 1, processes are usually adhoc. The organization usually does not provide a stable environment.
- ▶ Development is completely chaotic with budget and schedules often exceeded.
- ▶ In this scenario we can never predict quality.

## MATURITY LEVEL 2 (MANAGED)

- ▶ At maturity level 2, an organization has achieved all the **specific** and **generic** goals of the maturity level 2 process areas. In other words, the projects of the organization have ensured that requirements are managed and that processes are planned, performed, measured, and controlled.
- ▶ In the managed level basic project management is in place.
- ▶ But the basic project management and practices are followed only in the project level

## MATURITY LEVEL 3 (DEFINED)

- ▶ At maturity level 3, an organization has achieved all **specific** and **generic goals** of the process areas assigned to maturity levels 2 and 3.
- ▶ In the previous level all good practices and processes were done at project level.
- ▶ In this level all good practices and processes are brought to the organizational level.
- ▶ At maturity level 3, processes are well characterized and understood, and are described in standards, procedures, tools, and methods.
- ▶ An important distinction between maturity level 2 and 3 is that at level 3, processes are described in more detail and more rigorously than at level 2 and are at an organizational level.

# MATURITY LEVEL 4

## (QUANTITATIVELY MANAGED)

- ▶ At maturity level 4, an organization has achieved all the **specific goals** of the process areas assigned to maturity levels 2, 3, and 4.
- ▶ At this level processes are controlled by using statistical and other quantitative techniques.
- ▶ Product quality, processes performance and service quality are understood in statistical terms and are managed throughout the life of the processes.
- ▶ Maturity level 4 concentrate on using metrics to make decisions and to truly measure whether progress is happening and the product is becoming better.
- ▶ The main difference between level 3 and 4 is that at level 3, processes are qualitatively predictable.
- ▶ Level 4 addresses cause of process variation and take corrective actions.

## MATURITY LEVEL 5 (OPTIMIZING)

- ▶ At maturity level 5, an organization has achieved all the **specific goals** of the process areas assigned to maturity levels 2, 3, 4, and 5.
- ▶ Maturity level 5 focuses on continually improving process performance through both incremental and innovative technological improvements.
- ▶ In this level processes are continually improved based on an understanding of common causes of variation within the process.
- ▶ This is like the final level, defects are minimized, and products are delivered on time and within the budget boundary.

# CMMI DIFFERENT FROM OTHER MODELS

- ▶ CMMI provides a way to focus and manage hardware and software development from product inception through deployment and maintenance.
- ▶ It is a process improvement method
- ▶ It talks about processes I-e what process means to a company and how good a process is.

# CMMI VS AGILE

- ▶ The main goal of CMMI is organizational improvement. It is focused on existing processes. Through observing the existing behaviors, CMMI informs the team about their current performance and strengths.
- ▶ Agile is a software development methodology that breaks down the development process into iterations, known as sprints. The goal of each iteration is to produce a shippable product that can be handed over to a customer. The most popular Agile methodology type is called Scrum.



# Difference between CMMI and Agile

	CMMI	Agile
<b>Application</b>	Process improvements	Software development
<b>Focus</b>	Existing processes	New processes and products
<b>Main goal</b>	Organizational improvements	Shippable product

# ADVANTAGES OF CMMI MODEL

- ▶ Develops efficient process in organizations
- ▶ Allows process improvement in organizations
- ▶ A well interpreted, developed and properly followed process shall increase the ability to meet project goals and improve profitability
- ▶ Increased Productivity
- ▶ On Time Deliveries
- ▶ Increased client satisfaction
- ▶ Improved cycle time and quality
- ▶ increased return on investment

# DISADVANTAGES OF CMMI MODEL

- May require additional resources and knowledge in smaller organizations to initiate CMMI based process improvement.
- May require considerable amount of time and effort for implementation

# EXAMPLE- BOEING'S SPACE TRANSPORTATIONS SYSTEM SOFTWARE

- ▶ BOEING'S Space Transportations Systems Software after CMMI level 5 assessment achieved:
  - ❖ 140 % increase in general productivity
  - ❖ Elimination of defects prior to release increased from 94% to 100%

# CONCLUSION

- CMMI is a model for process improvement from which organizations will abstract and create process improvement solution that fit their unique environment to achieve specific organizational goals. CMMI is a framework of best practices. It describes the characteristics of good process and provides the guidelines for companies developing their own processes.

# Thank You!

