Capability Maturity Model Integrated
Short Overview

Quality
Frameworks

Outline

- Introduction
- High level overview of CMMI
- Questions and comments

What is CMMI?

- CMMI (Capability Maturity Model Integration) is a proven industry framework to improve product quality and development efficiency for both hardware and software
  - CMMI has been established as a model to improve business results
  - Emphasis on business needs, integration and institutionalization
- CMMI (Capability Maturity Model Integration) not asks What to do? It asks, How to do?

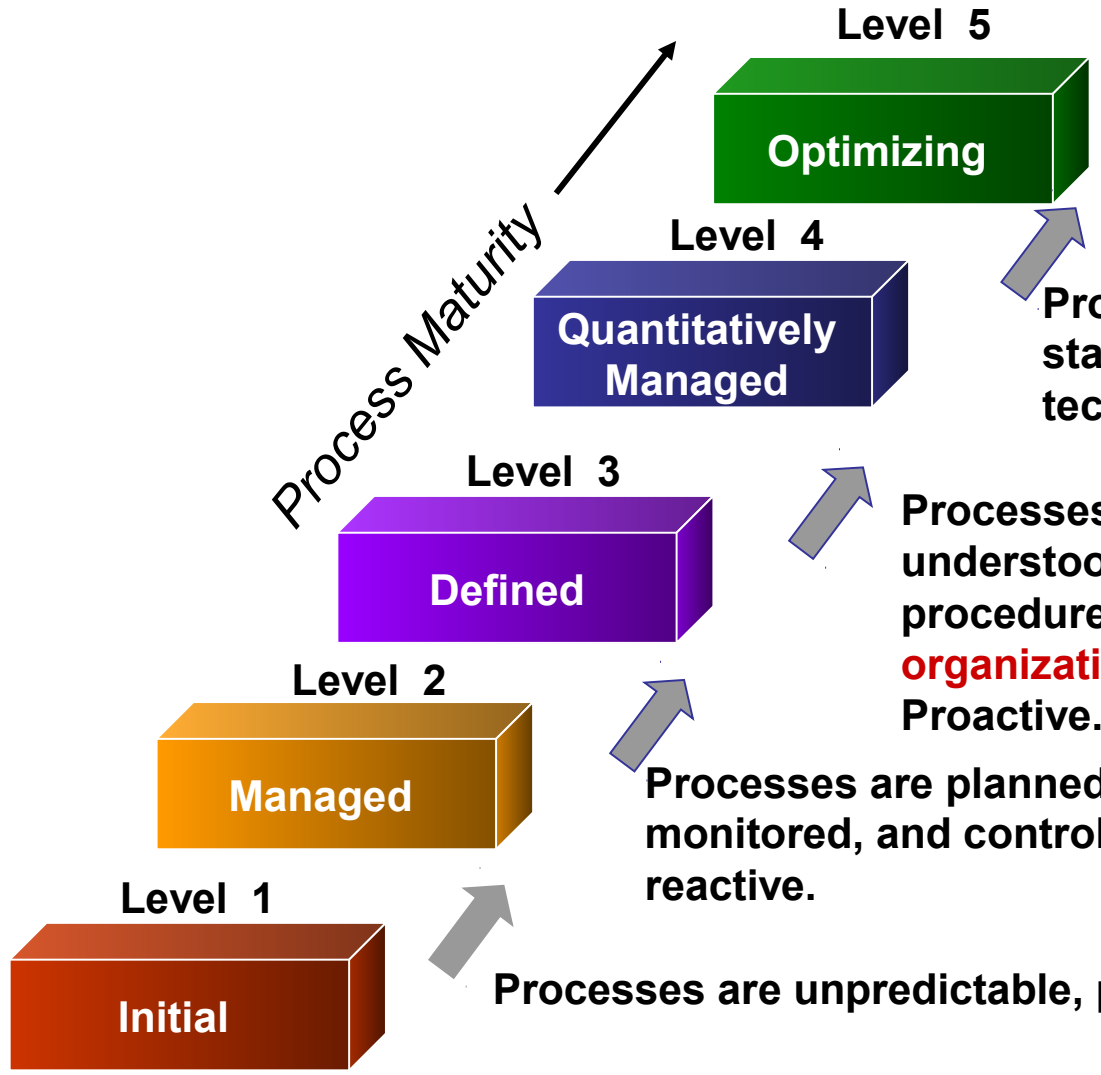
How can CMMI help?

- CMMI provides a way to focus and manage hardware and software development from product inception through deployment and maintenance.
  - ISO-9000 are still required. CMMI interfaces well with them. CMMI and TL are complementary - both are needed since they address different aspects.
    - ISO-9000 is a process compliance standard
    - CMMI is a process improvement model
- Behavioral changes are needed at both management and staff levels. Examples:
  - Increased personal accountability
  - Tighter links between Product Management, Development, SCN, etc.
- Initially a lot of investment required – but, if properly managed, we will be more efficient and productive while turning out products with consistently higher quality.

CMMI Models within the Framework

- Models:
  - **Systems Engineering + Software Engineering (SE/SW)**
  - Systems Engineering + Software Engineering + Integrated Product and Process Development (IPPD)
  - Systems Engineering + Software Engineering + Integrated Product and Process Development + Supplier Sourcing (SS)
  - Software Engineering only
- Representation options:
  - **Staged**
  - Continuous

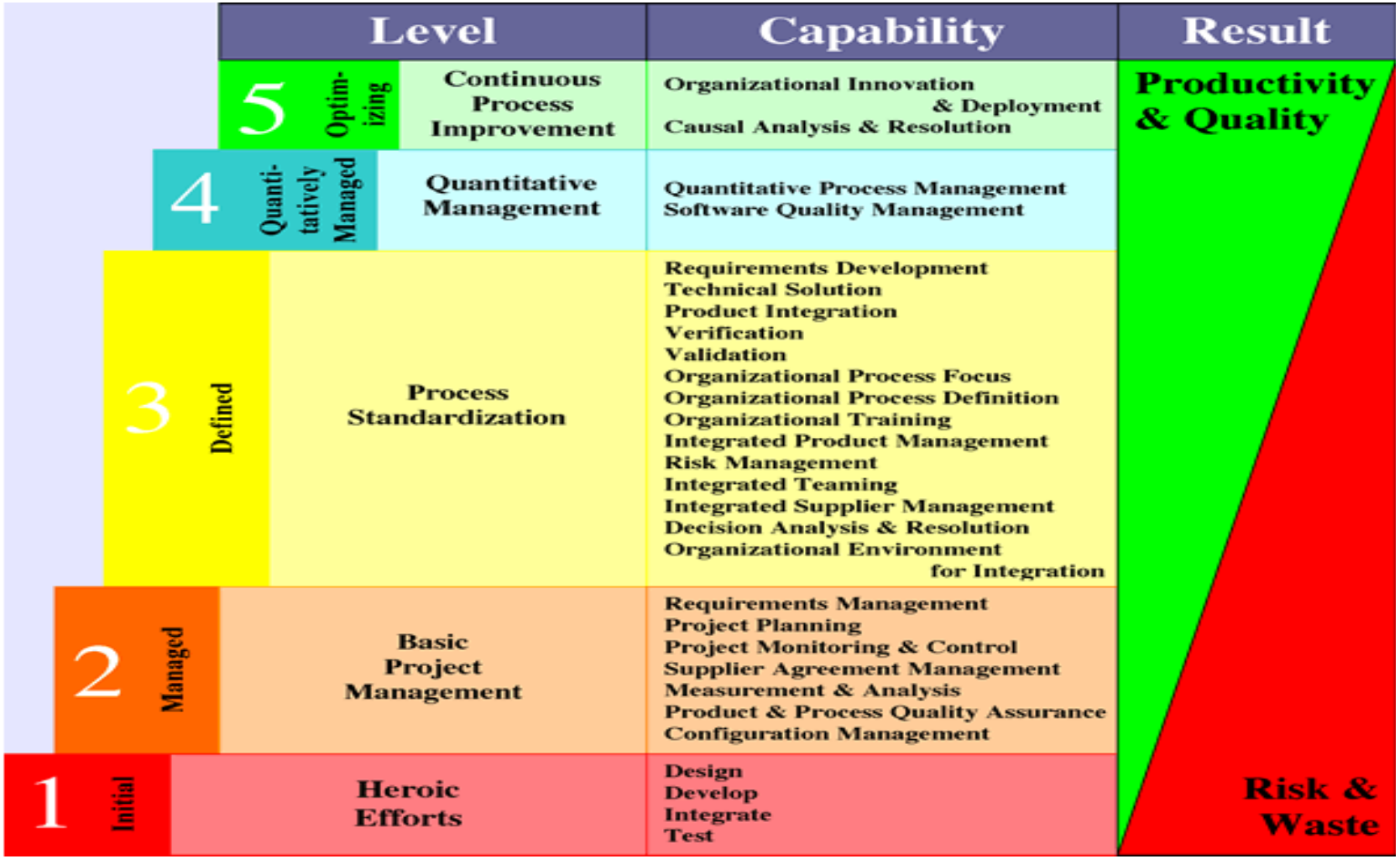
CMMI Staged Representation - 5 Maturity Levels



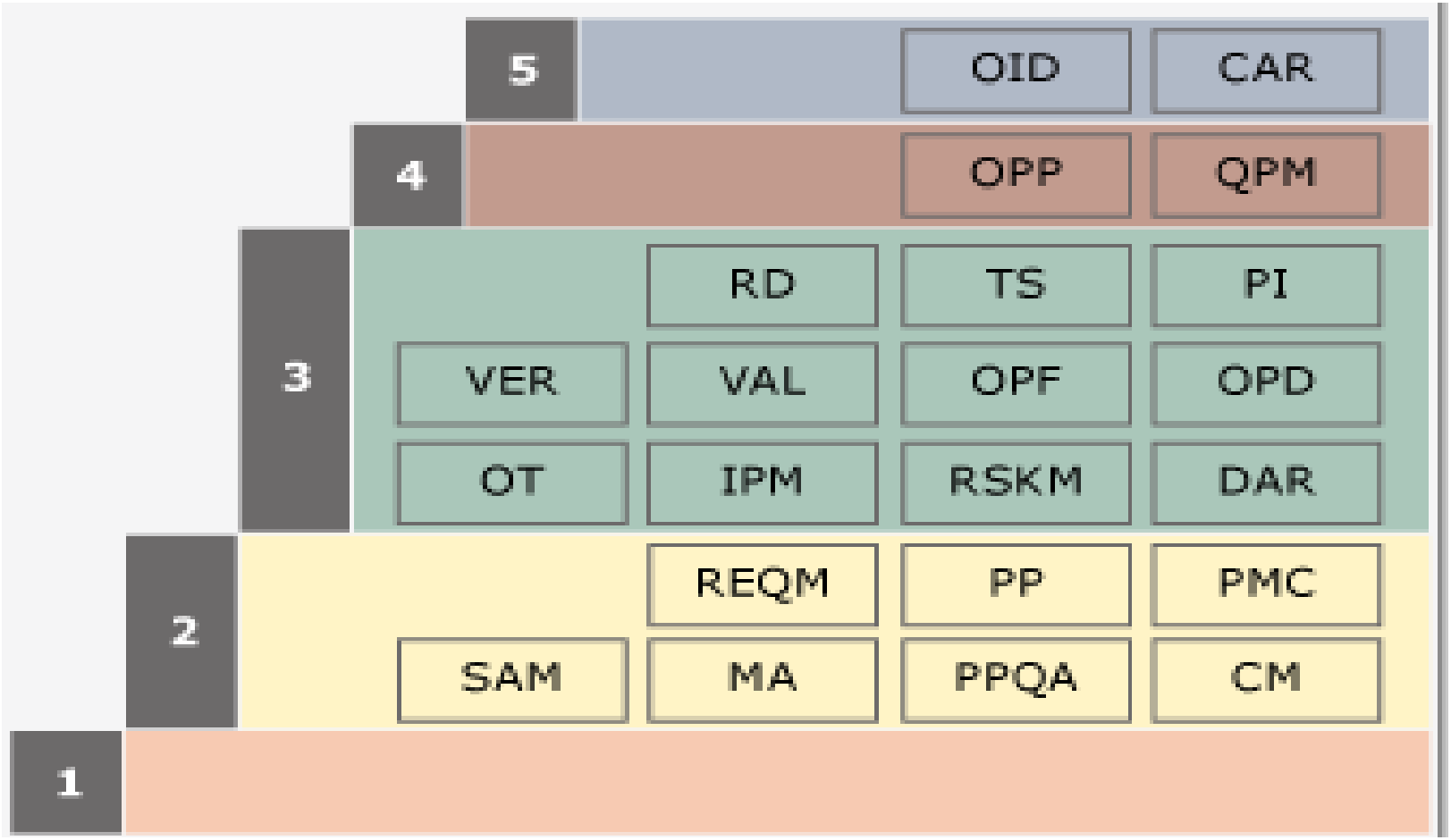
Behaviors at the Five Levels

Maturity Level	Process Characteristics	Behaviors
5 Optimizing	Focus is on continuous quantitative improvement	Focus on "fire prevention"; improvement anticipated and desired, and impacts assessed.
4 Quantitatively Managed	Process is measured and controlled	Greater sense of teamwork and inter-dependencies
3 Defined	Process is characterized for the organization and is proactive	Reliance on defined process. People understand, support and follow the process.
2 Managed	Process is characterized for projects and is often reactive	Over reliance on experience of good people – when they go, the process goes. “Heroics.”
1 Initial	Process is unpredictable, poorly controlled, and reactive	Focus on "fire fighting"; effectiveness low – frustration high.

CMMI Levels……..


Level
Capability
Result
5 Optim-izing
Continuous Process Improvement
Organizational Innovation & Deployment
Causal Analysis & Resolution
4 Quanti-tatively Managed
Quantitative Management
Quantitative Process Management
Software Quality Management
3 Defined
Process Standardization
Requirements Development
Technical Solution
Product Integration
Verification
Validation
Organizational Process Focus
Organizational Process Definition
Organizational Training
Integrated Product Management
Risk Management
Integrated Teaming
Integrated Supplier Management
Decision Analysis & Resolution
Organizational Environment for Integration
2 Managed
Basic Project Management
Requirements Management
Project Planning
Project Monitoring & Control
Supplier Agreement Management
Measurement & Analysis
Product & Process Quality Assurance
Configuration Management
1 Initial
Heroic Efforts
Design
Develop
Integrate
Test
Productivity & Quality
Risk & Waste

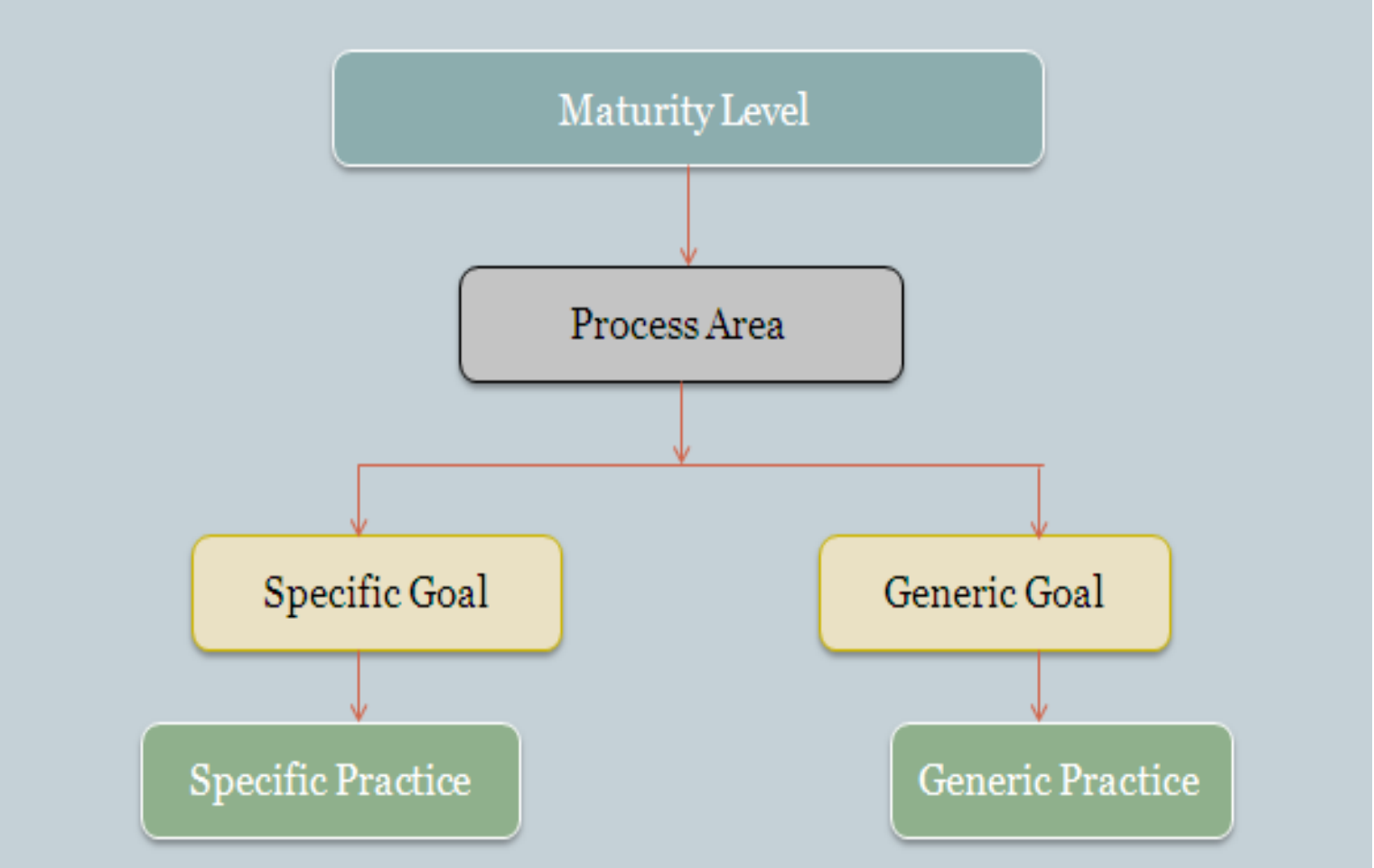
Level Wise Process Areas



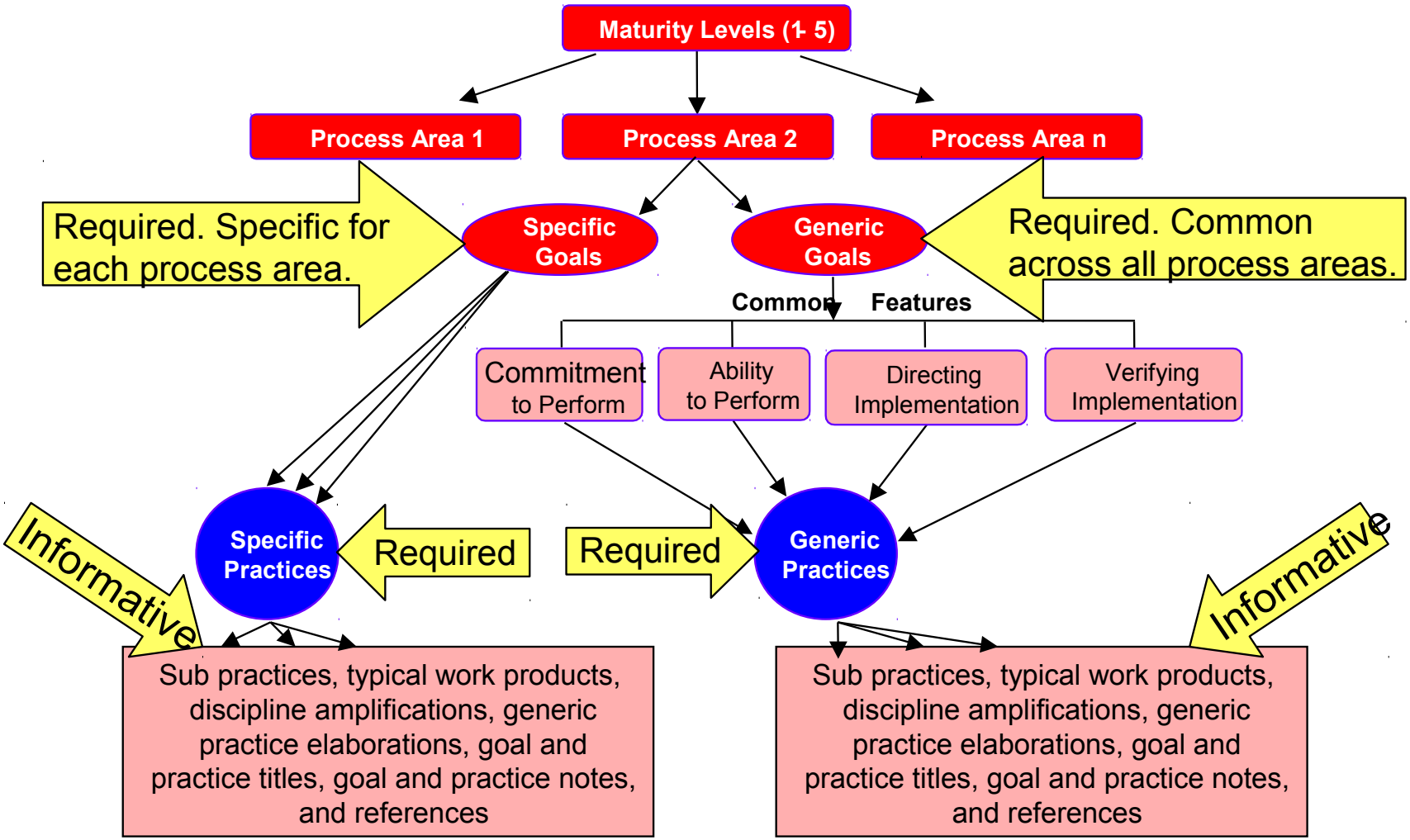
CMMI Process Areas

Maturity Level	Project Managment	Engineering	Process Management	Support
5 Optimizing			Organizational Innovation & Deployment	Causal Analysis & Resolution
4 Quantitatively Managed	Quantitative Project Mngt		Organizational Process Performance	
3 Defined	Integrated Project Mngt Risk Management	Requirements Development Technical Solution Product Integration Verification Validation	Organizational Process Focus Organizational Process Definition Organizational Training	Decision Analysis & Resolution
2 Managed	Project Planning Project Monitoring & Control Supplier Agreement Mngt	Requirements Mngt		Measurement & Analysis Process & Product Quality Assurance Configuration Mngt
1 Initial				

CMMI Components



CMMI Terminology & Structure



CMMI Pitfalls of implementation

How Long Does it Take?

- Implementing CMM does not occur overnight.
- Implementing CMM is not merely a “paper drill”.
- Typical times for implementation:
  - 3-6 months of preparation
  - 6-12 months of implementation
  - 3 months of assessment preparation
  - 12 months for each new level

Pitfalls of CMMI implementation

Is It Perfect?

- No! Some implementations do more harm than good.
  - Complete re-vamp of processes to “get certified” instead of smartly adapting processes.
  - Process focus used more as a stick than as a carrot.
  - Focusing on compliance instead of improvement.

Advantage of CMMI implementation

- Defect rates have dropped
- Defect detection occurs earlier
- User requirements are documented, controlled, and managed with monitoring
  - Especially important when users change their minds!
- Estimating improves and becomes more precise
- Risk management is a practice
- Development processes remain agile!

CMMI Implementation Best Practices

- Be Realistic – Some processes will be more ready than others.
- Be Flexible – Allowing tailoring is key to adoption.
- Be Open – The key is to learn how to do things better, not how to “comply”.
- Be Patient – It does not happen overnight.

CMMI Resources

- Software Engineering Institute's CMMI website:

  http://www.sei.cmu.edu/cmmi/

THANKS to ALL