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Advanced System Engineering Processes

SCRUM and the CMMI
"The Wolf and the Lamb shall Feed Together"

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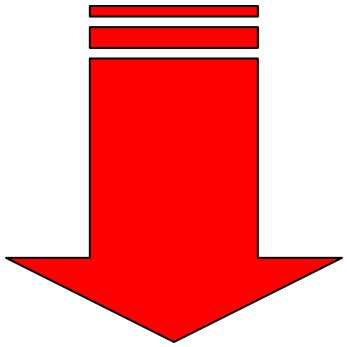
Today's Reality

- Large Number of users
- Frequent changes in requirements
- Dynamicity of technologies
- Increased size and complexity of systems
- Competition
- Global development groups
- Product quality

- Decrease time to market
- Limited budgets

“If you keep doing the same things you’ll get the same results”



Change Processes

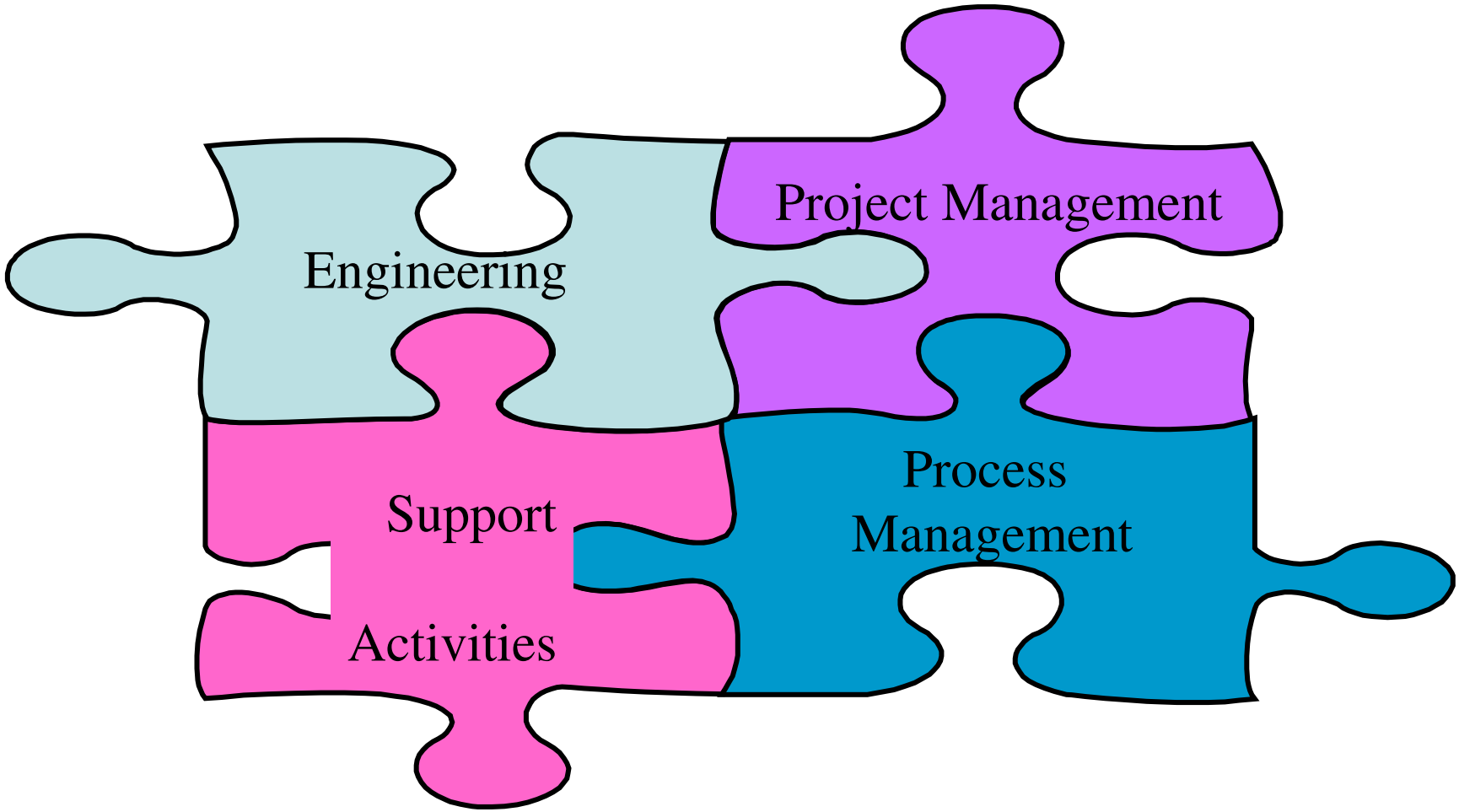
Content

- What is the CMMI?
- An overview to the Scrum
- CMMI and the Scrum

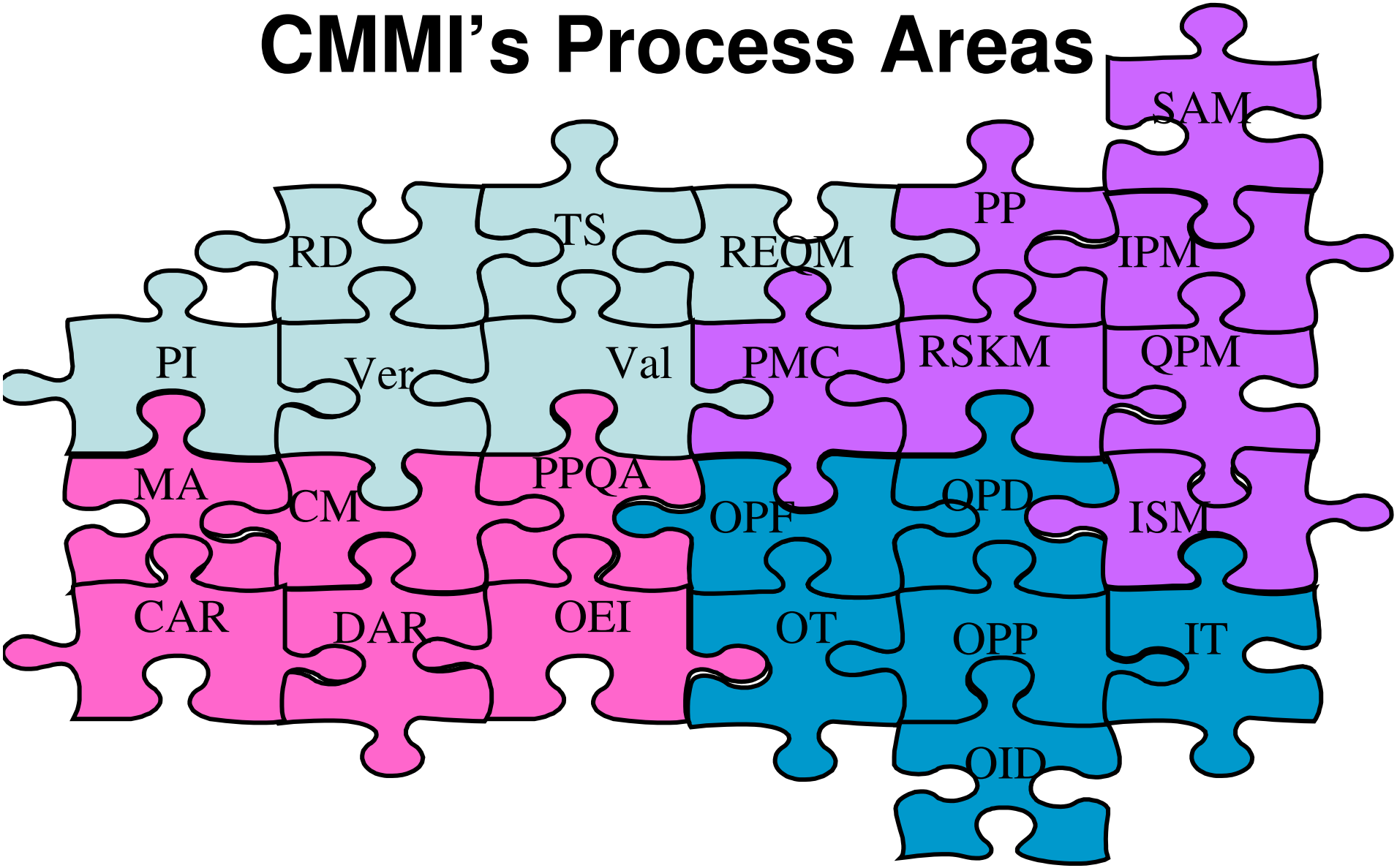
The CMMI - What is it?

- A **comprehensive** set of **best practices** for development and maintenance of systems
- Used for processes improvement and evaluations of organizational capabilities for **SW and System engineering**
- Developed by SEI in Carnegie-Mellon University
- Used by thousands of companies around the world and tens of companies in Israel
- Used by **large and small** companies in various domains

Model Focus


Project Management
Engineering
Process
Management
Support
Activities

CMMI's Process Areas



An Example for Process Area - Requirements Management

- **Purpose:**

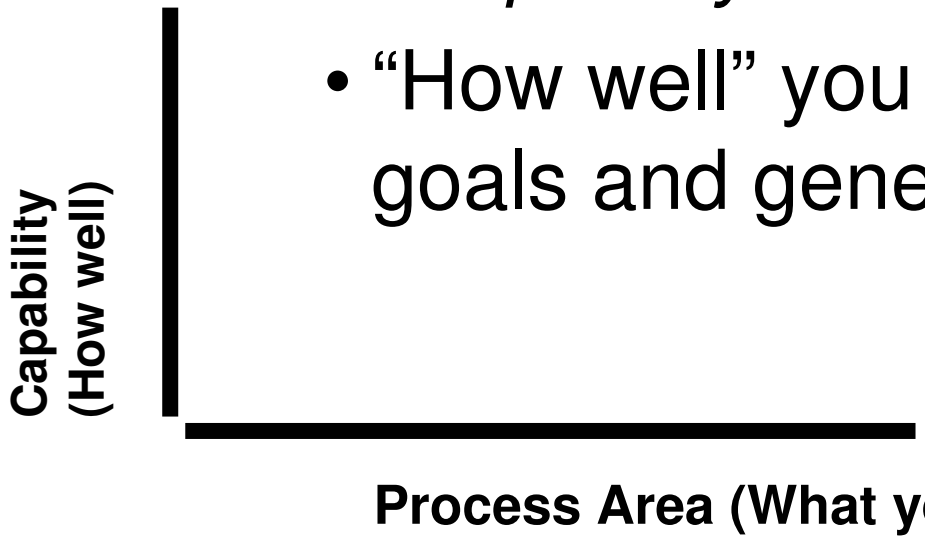
  Manage the requirements of the project's products and product components and to identify inconsistencies between those requirements and the project's plans and work products

- **Goals:**
  - **SG 1 Manage Requirements**

    Requirements are managed and inconsistencies with project plans and work products are identified.

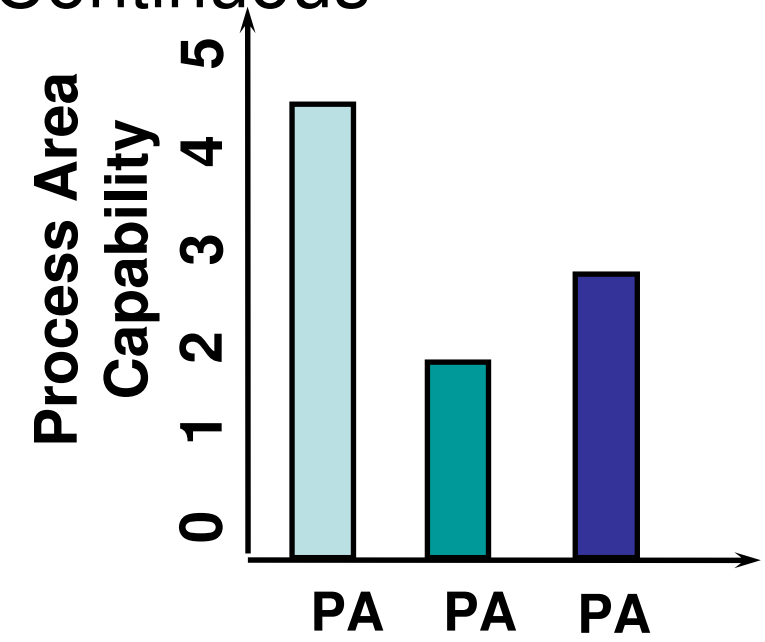
The Dimensions of The CMMI

- the *process dimension*
  - "What" you do - *Process Area, Specific goals, specific practices*
- the *capability dimension*
  - "How well" you do it – Generic goals and generic practices



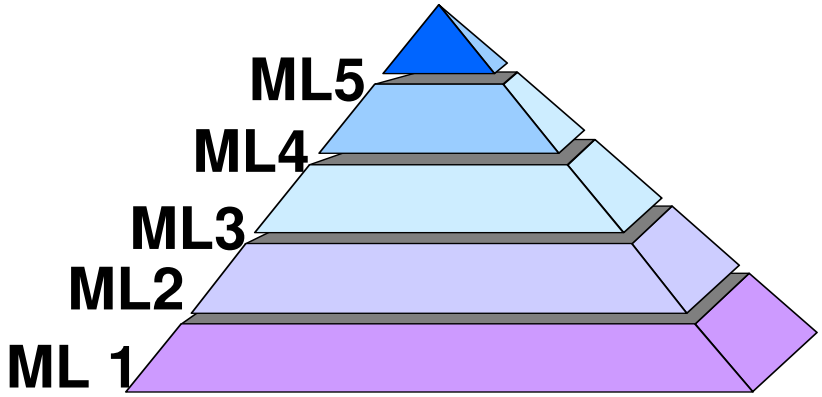
The Model Representation

- Continuous



. . .for a single process area or a set of process areas

- Staged



. . .for an established set of process areas across an organization

Why it Works?

- Allows incremental improvement
- Driven by organizational business goals and needs
- Integrates practices from management, engineering, support and organizational processes
- Does not require usage of a specific method or tool

Scrum – What is It?

- Scrum is one of the popular **Agile Development methodologies**, that have gained popularity in recent years
- Developed as a mean to deal with **ever changing requirements and dynamic technologies** and the need to **speed up product** development
- Defined as a **wrapper** around existing engineering practices of the organization

Scrum Concepts

- Incremental development
- Organized by short period **Sprints**.
- The content of a sprint is defined in a **sprint backlog**, taken out of the **Product Backlog.**
- **Anyone can insert** items into the Product Backlog, only **Product Owner** can prioritize
- During the sprint, the team is isolated from changed requirements

Scrum Concepts (Con.)

- Short **daily scrum** meetings are used for coordination and problem resolution **(Scrum Master)**
- Anyone can observe, only team members can speak
- Sprints are defined in the **Sprint Planning meeting, and reviewed in the Sprint Review meeting**
- Autonomous, focused development team

CMMI and the Scrum

- CMMI is a model and the Scrum is a development method
- CMMI fits SW and System engineering and other disciplines while Scrum is focused on SW
- CMMI fits all size of organizations Scrum fits small to mid size projects
- CMMI includes practices that allow the organization to institutionalize mature processes

Scrum Concepts and the CMMI's Process Areas

- **Requirement Management**
  - **Product backlog** – list of all items to be developed, continuously prioritized
  - **Product owner** - sets priorities
  - **Scrum team** - takes what it believe it can do in within a sprint
  - **Requirement changes** – not allowed during the sprint
- **Project Planning**
  - **Sprint** – a complete lifecycle (plan, define, develop, test) within a short period
  - **Sprint Planning** - meeting to define content of coming sprint
  - **Sprint backlog** – defines the scope of the sprint
  - **Sprint goal** – a minimal objective for the sprint that must be achieved
- **Project Monitoring and Control**
  - **Daily Scrum meeting** – short daily meeting, 3 key questions: "what have I done yesterday", "what will I do today", "what is in my way"
  - **Sprint review meeting** - at the end of the sprint, review results, analyze difficulties
- **Verification/validation**
  - **Incremental** – every version must be tested

Scrum Concepts and the CMMI's Generic practices

- **GP 2.4 Roles and responsibilities**
  - **Product Owner** - sets priorities
  - **Team** – autonomous, focused on achieving goals
  - **Scrum master** – his role is to remove blocks from the team
- **GP 2.7 Identify and involve relevant stakeholders**
  - **Scrum meetings** (daily, sprint planning, sprint review) – open for all, but only team members can speak
  - **Sprint backlog** –visibility for all to see progress
- **GP 2.10 Review status with higher level management**
  - **Sprint review meeting** - at the end of the sprint, review results, analyze difficulties

Consequences

- As Scrum is a wrapper of existing engineering practices, it does not contradict the CMMI
- The Scrum fulfills some of the requirements of the CMMI practices and gives them an Agile-driven implementation
- The combination of Scrum and CMMI can be ideal for smaller projects within CMMI-aware organizations

What Can You Gain by Using the CMMI with the Scrum?

- **CMMI as a framework**
  - **Comprehensive set of practices for management and engineering for all disciplines**

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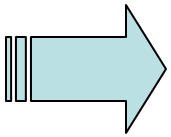
- **Scrum as a method**
  - **Better responsiveness to dynamic & changing business and technology environments**



- **Shorter time to market**
- **Higher product quality**
- **Increased visibility into the developed product**
- **Improved communication and cooperation within the organization**
- **Higher employee moral**

What Can You Gain by Using the CMMI with the Scrum?

- **CMMI as a framework**

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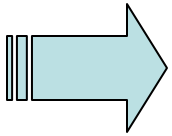
- **Scrum as a method**



– **Benefits to: the Organization, its Customers, and its Employees**

References

- CMMI, Guidelines for Process Integration and product improvement, M.B Chrissis, M. Konard, S. Shrum, Addison Wesley, 2003
- Agile Software Development with Scrum, K. Schwaber, M. Beedle, Prentice Hall, 2002

- Thanks for your participation

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