

A large, light pink circular graphic with a white notch cut out of its top and bottom edges, resembling a stylized 'H' or a large letter 'C'.

CMMI

What do we have to do in
Requirements Management
and Engineering?

Capability Maturity Model Integration

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More information under:

<http://www.sei.cmu.edu/publications/documents/02.reports>

Aims

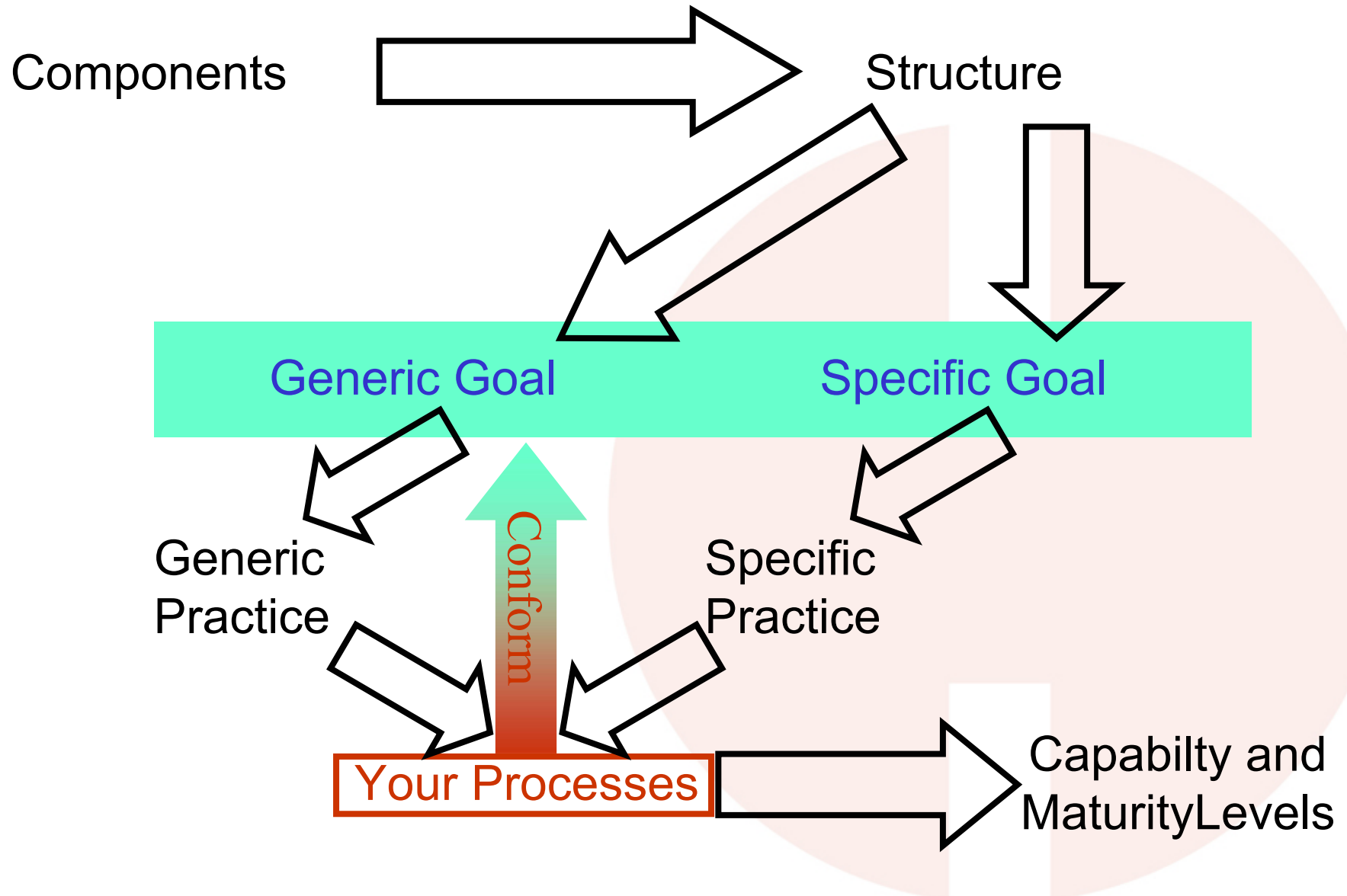
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to introduce you to CMMI

to show the difference between CMMI Goals and Practices

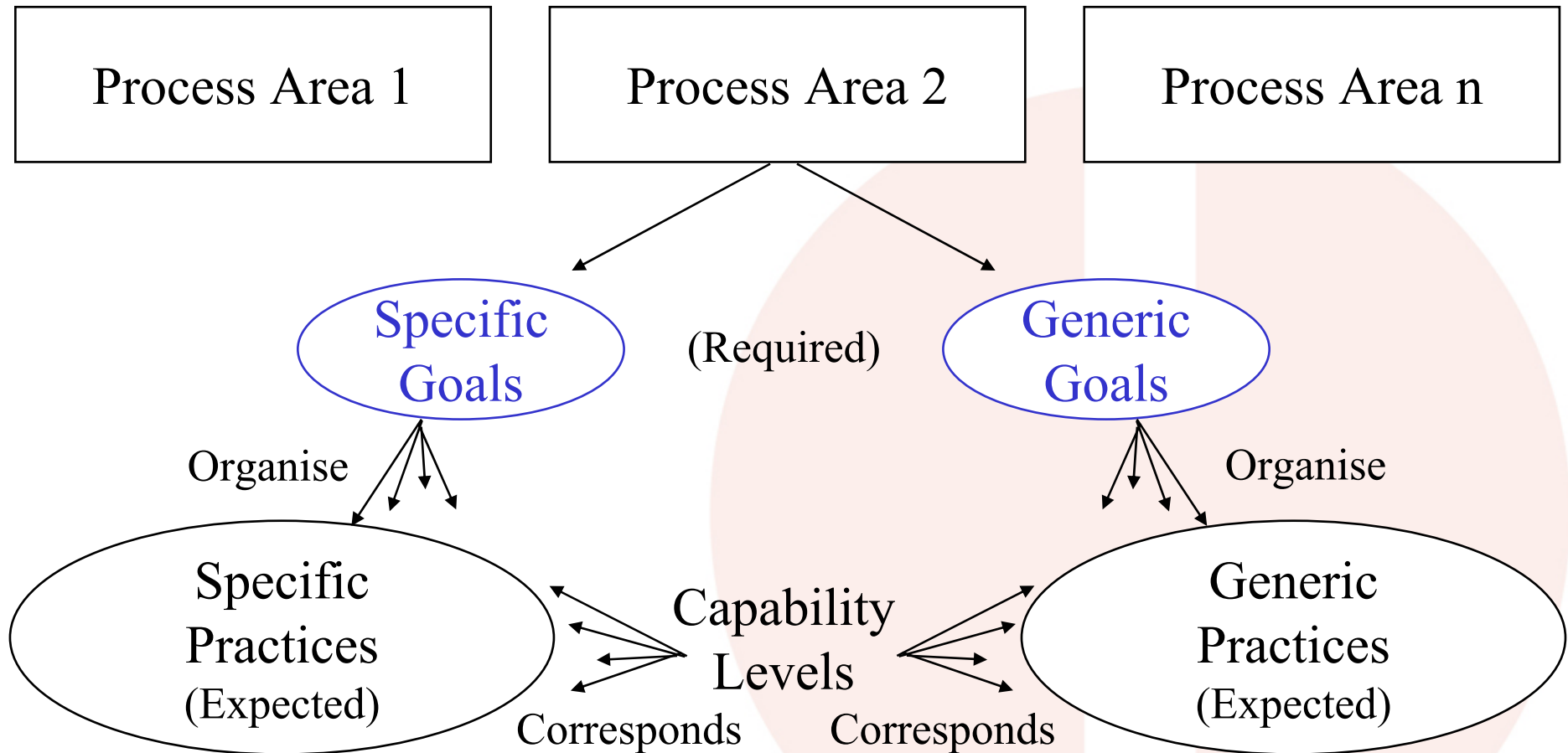
and

to show a little of what is needed to achieve conformance to CMMI for Requirements Management and Engineering process capabilities.



CMMI Model Components

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CMMI (SM) for Systems Engineering
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Structure of CMMI

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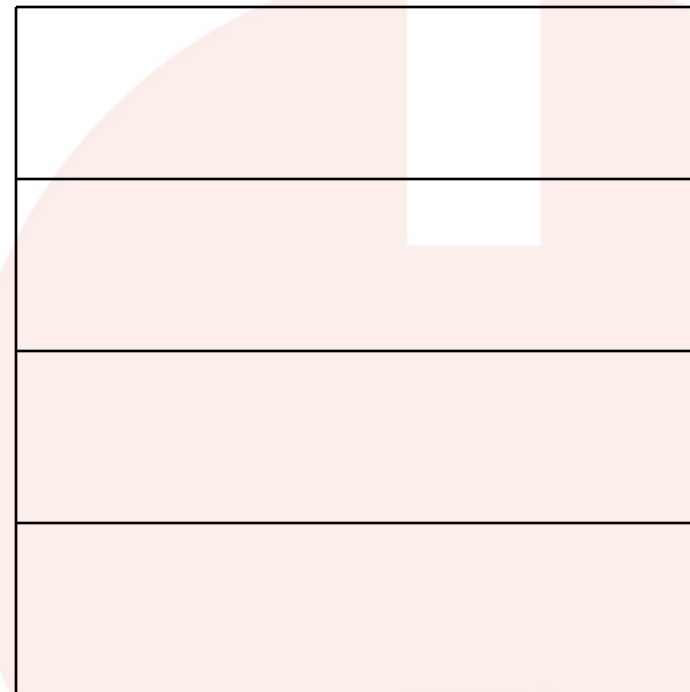
Process
Area
Categories

Process Management

Project Management

Engineering

Support



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Structure of CMMI

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Process Area Categories

Process Management

Project Management

Engineering

Support

Level 0

Level 1

Level 2

Level 3

Level 4

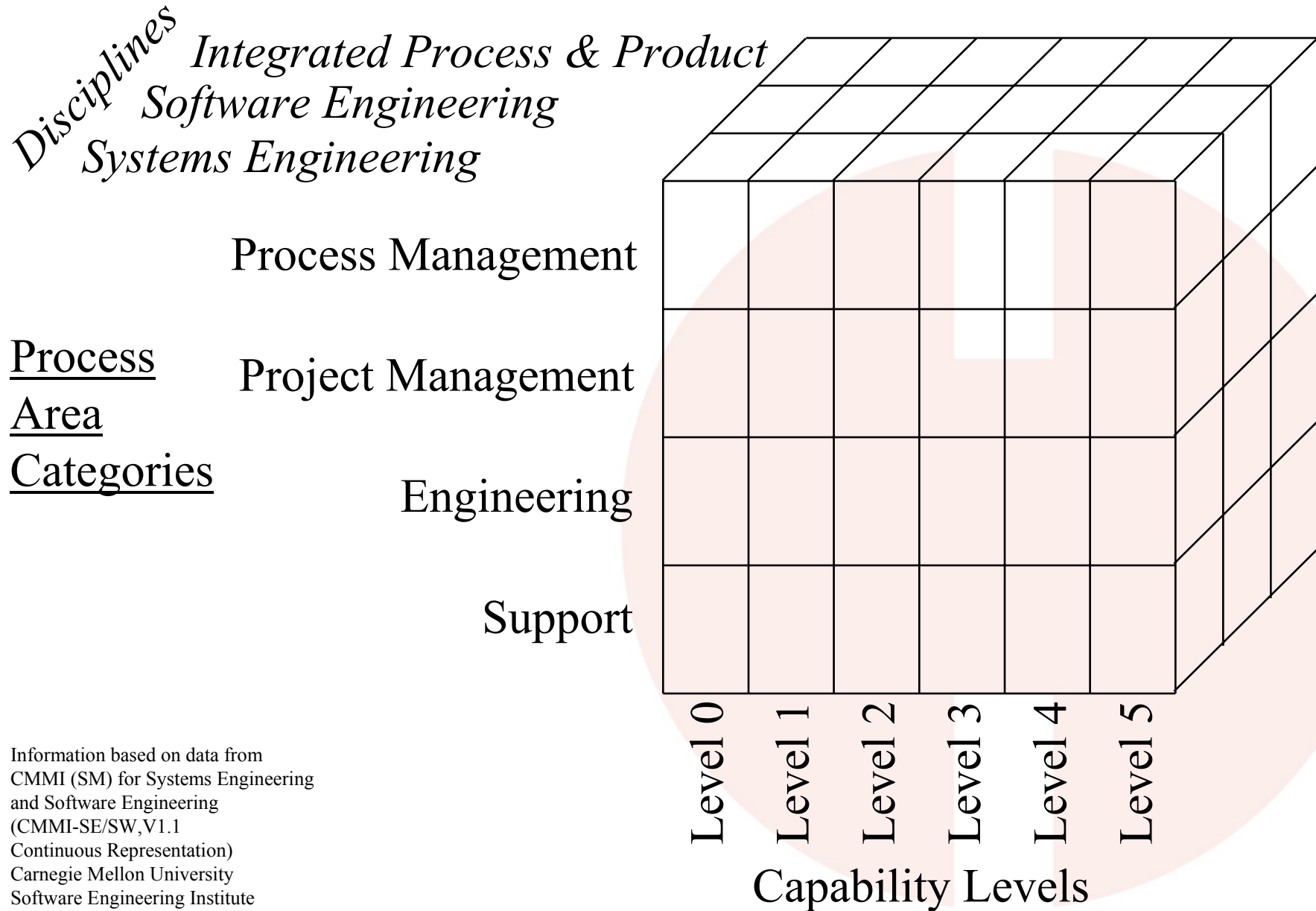
Level 5

Capability Levels

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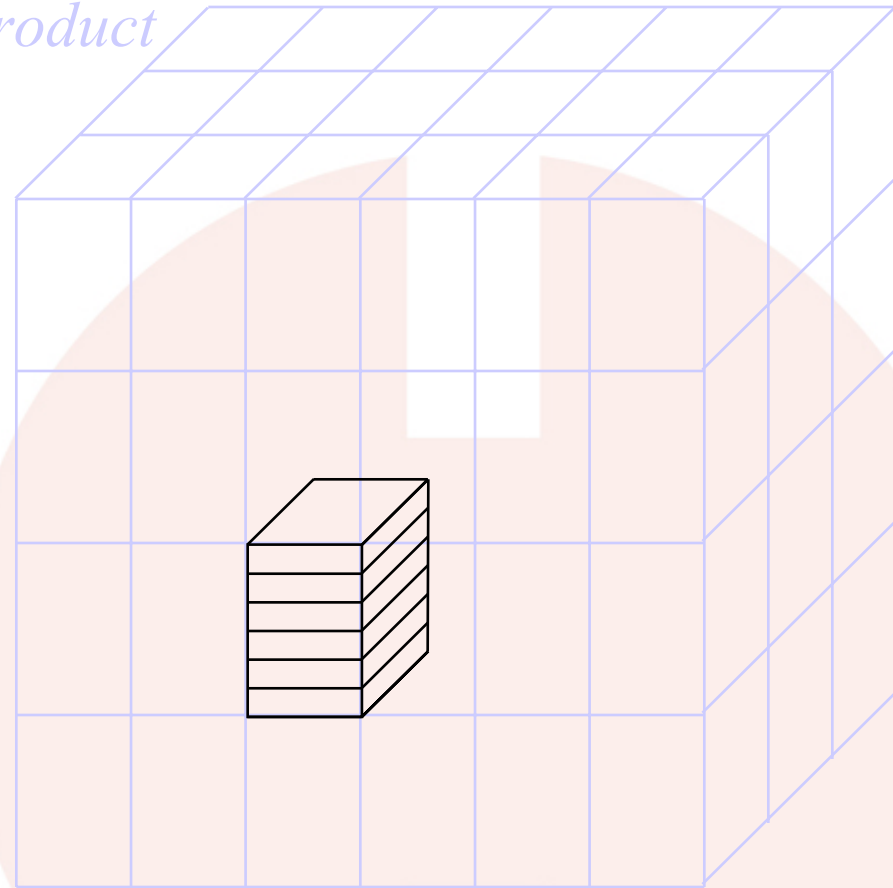
Structure of CMMI

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Disciplines
Integrated Process & Product
Software Engineering
Systems Engineering

Process
Area
Categories

Process Management
 Project Management
 Engineering
 Support



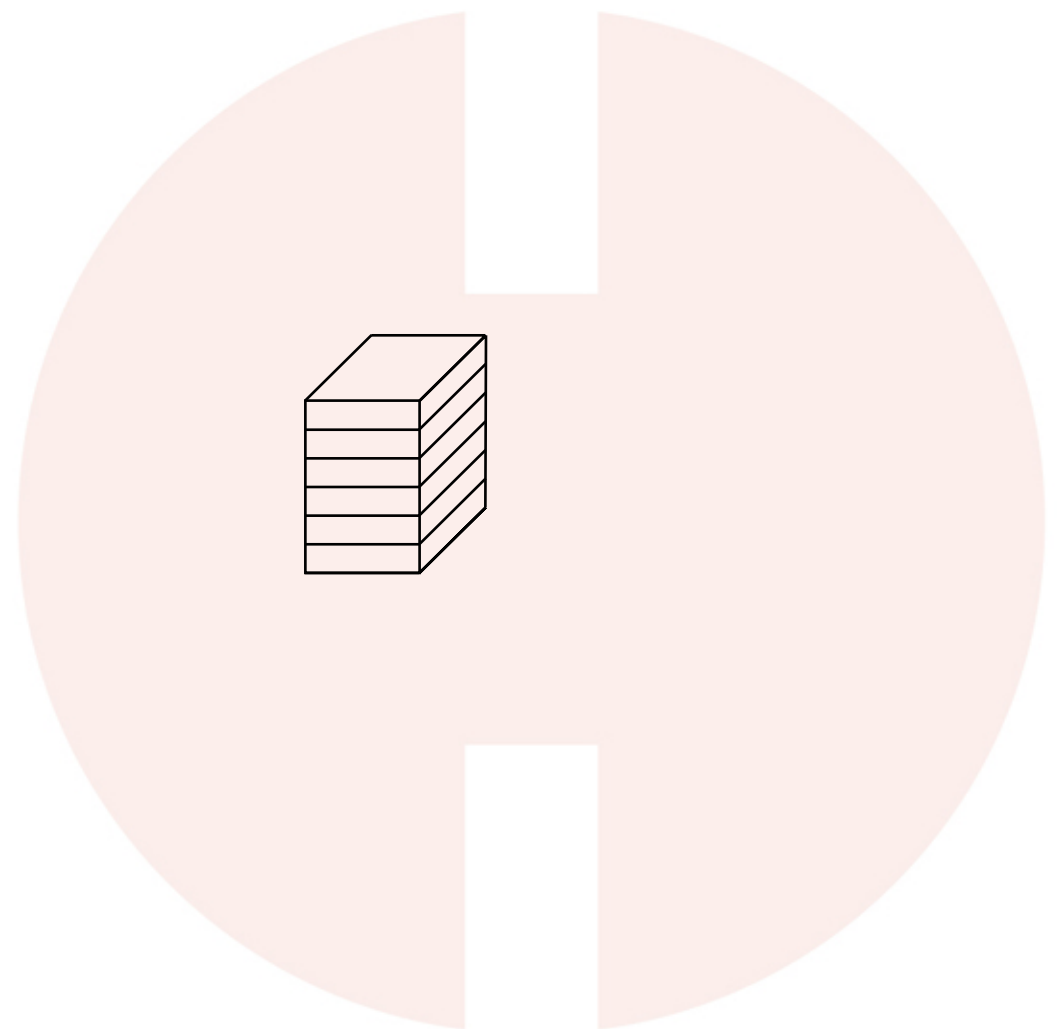
Level 0
 Level 1
 Level 2
 Level 3
 Level 4
 Level 5

Capability Levels

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Structure of CMMI: Engineering

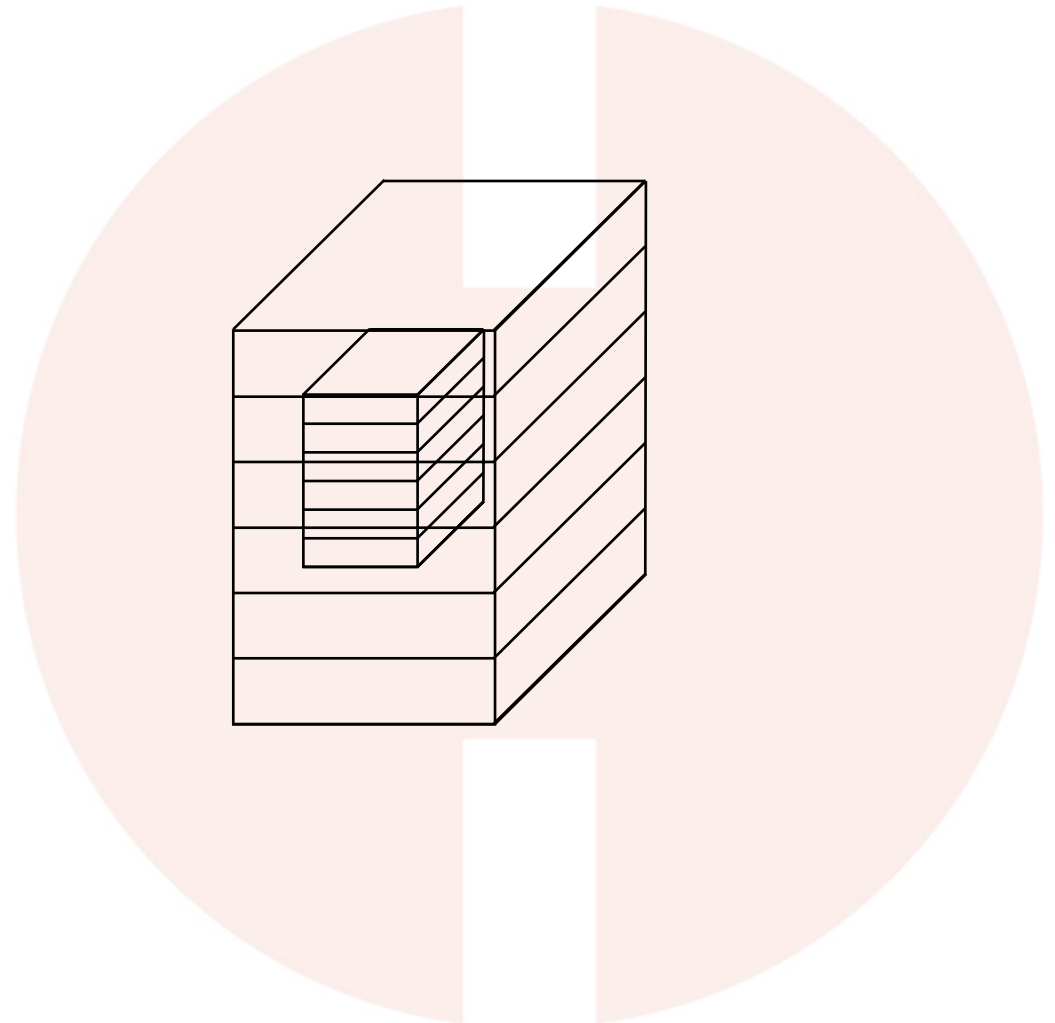
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Structure of CMMI: Engineering

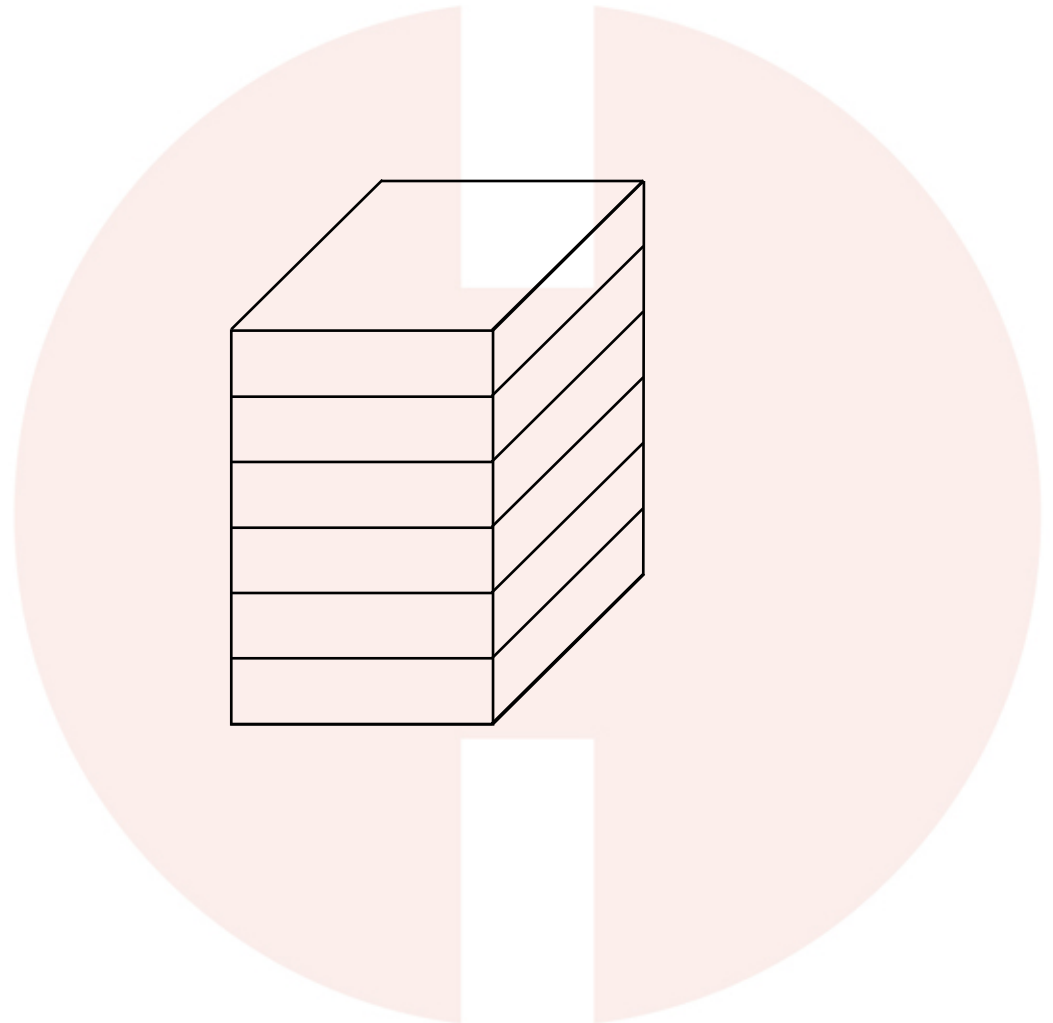
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Structure of CMMI: Engineering

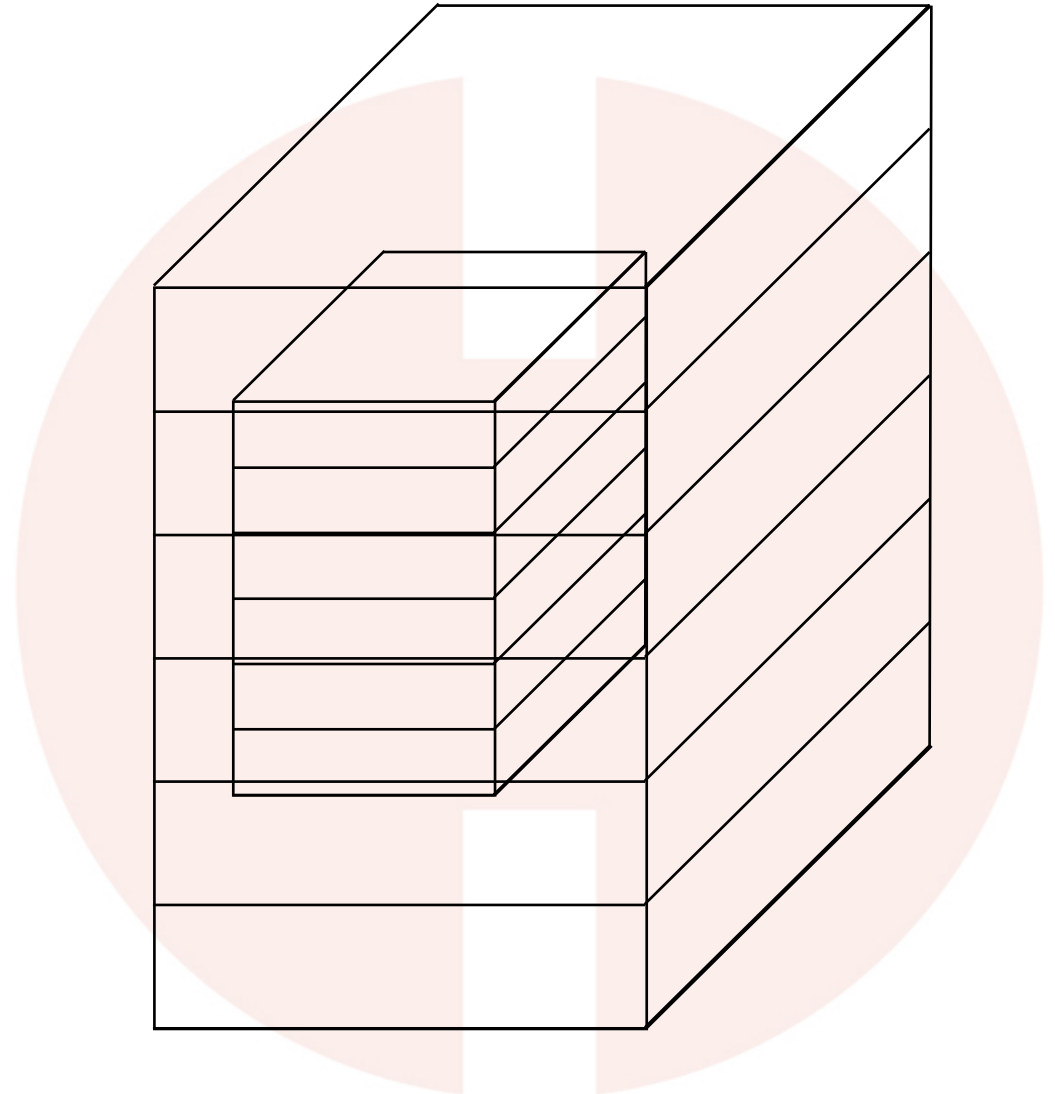
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Structure of CMMI: Engineering

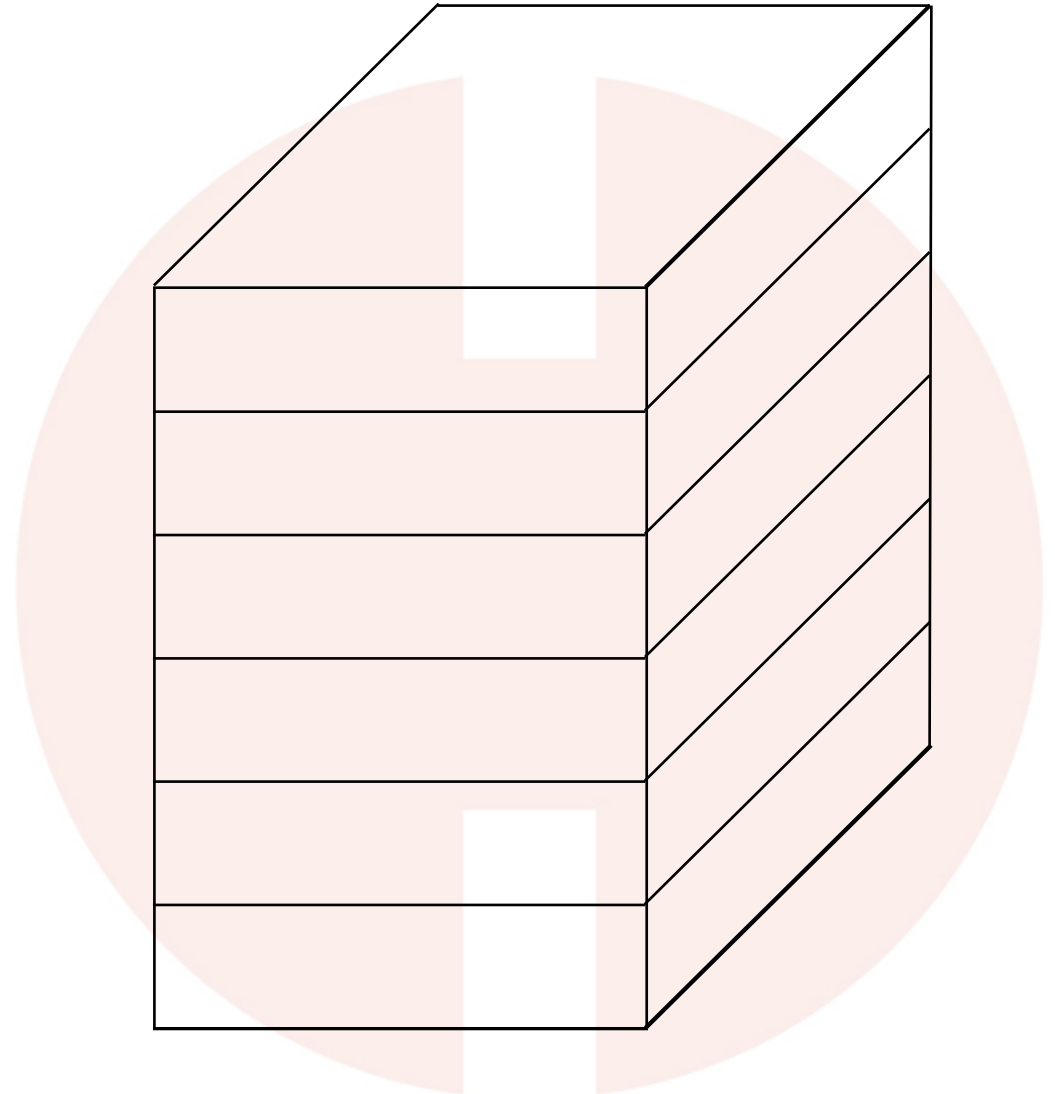
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Structure of CMMI: Engineering

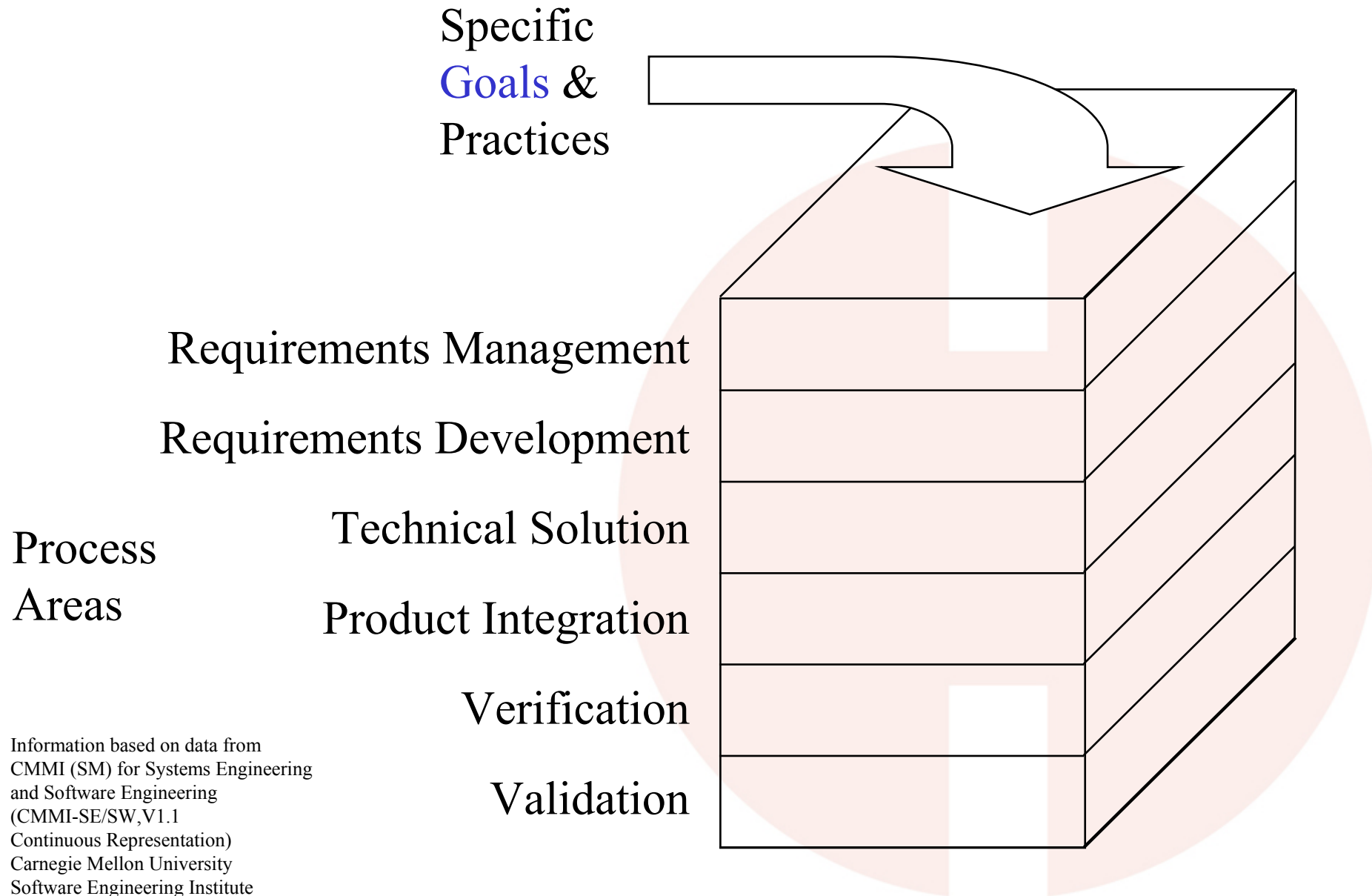
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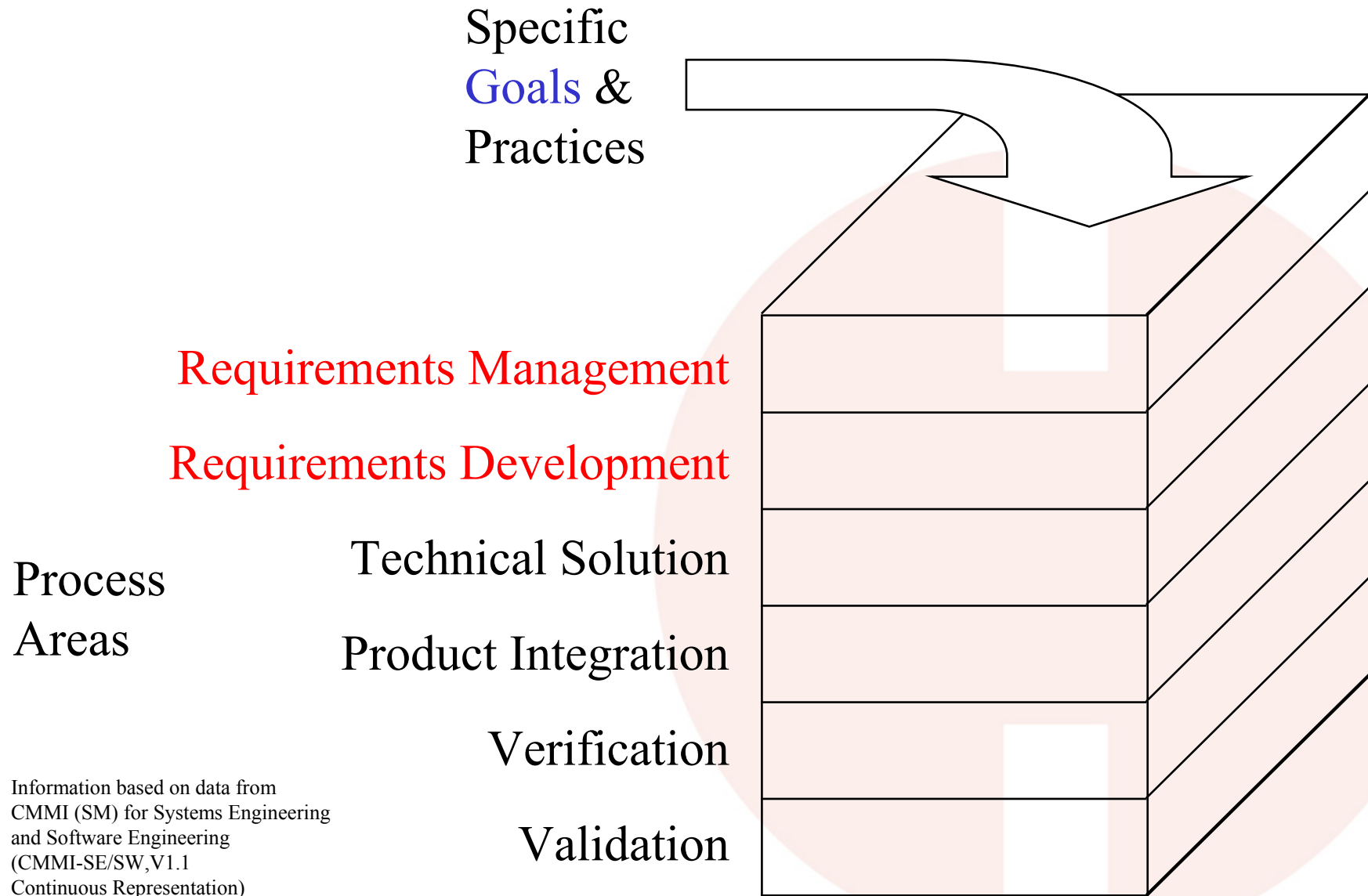
Structure of CMMI: Engineering

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Structure of CMMI: Engineering

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Example **Specific Goal** and **Specific Practices**

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SG 1 Manage Requirements

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

SP 1.1-1 Obtain an Understanding of Requirements

Develop an understanding with the requirements providers on the meaning of the requirements.

SP 1.2-2 Obtain Commitment to Requirements

Obtain commitment to the requirements from the project participants.

SP 1.3-1 Manage Requirements Changes

Manage changes to the requirements as they evolve during the project.

SP 1.4-2 Maintain Bidirectional Traceability of Requirements

Maintain bidirectional traceability among the requirements and the project plans and work products.

SP 1.5-1 Identify Inconsistencies between Project Work and Requirements

Identify inconsistencies between the project plans and work products and the requirements.

A Capability Level Corresponds to a **Generic Goal (GG)** which Organises **Generic Practices (GP)**

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There are six capability levels, designated by the numbers 0 through 5:

5. Optimizing

4. Quantitatively
Managed

3. Defined

2. Managed

1. Performed

0. Incomplete

GG2 Institutionalize a Managed Process

The process is institutionalized as a managed process

GP 2.1 Establish an Organizational Policy

GP 2.2 Plan the Process

GP 2.3 Provide Resources

GP 2.4 Assign Responsibility

GP 2.5 Train People

GP 2.6 Manage Configurations

GP 2.7 Identify & Involve Relevant Stakeholders

GP 2.8 Monitor and Control the Process

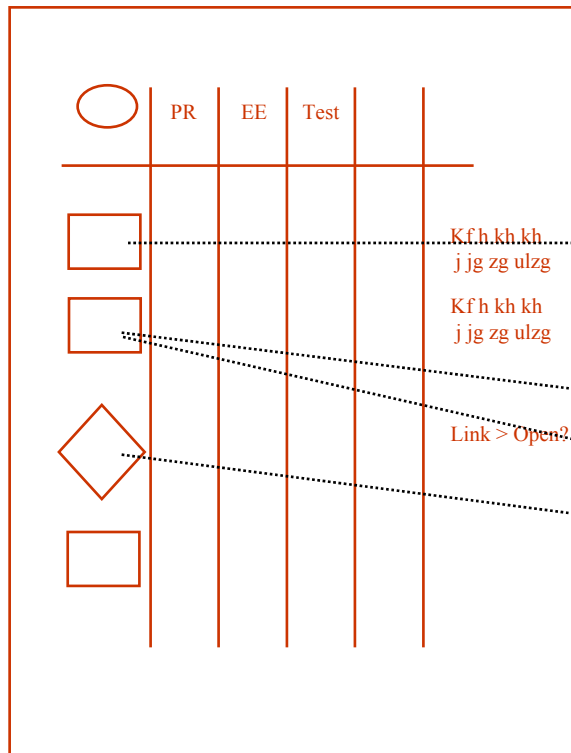
GP 2.9 Objectively Evaluate Adherence

**GP 2.10 Review Status with Higher Level
Management**

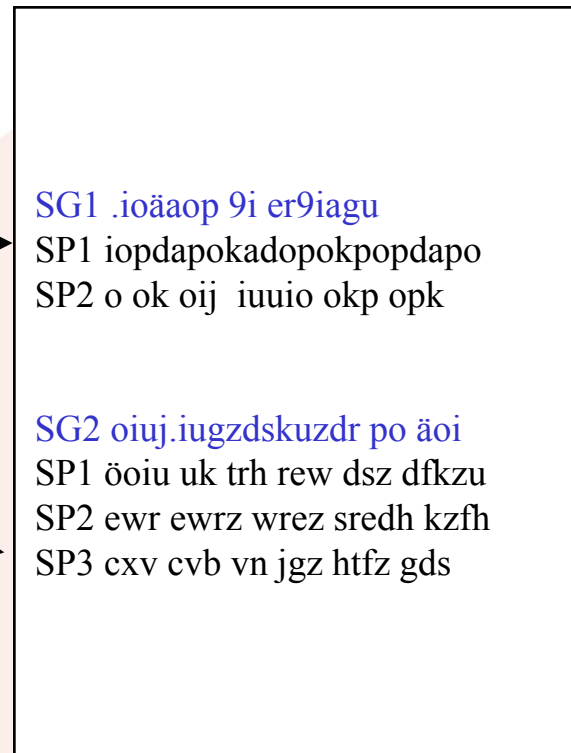
Showing Conformance

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Planned Process Definition



CMMI Goals and Practices



An Incomplete Example Showing Conformance

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Problem Domain		Solution Domain	
Generic Goal	Specific Goal	Specific/Gen. Practice	Example Implementat'n
Level 2 GG2 Institutionalise a Managed Process The Process is Institutionalized as a managed process	SP1 Manage Requirements	SP1.1-1 Obtain an Understanding of Requirements	At a Requirements Elicitation Workshop all attendees will discuss, model, and document requirements to develop an understanding of the requirements
	Requirements are managed and inconsistencies	SP1.2-2 Obtain Commitment to Requirments	The commitment to the requirements documented at the workshop will be obtained and documented through acceptance of the requirements at reviews during the workshop.
	with Project Plan and Work Products are identified	GP2.1 Establish an Organizational Policy	The Project Member responsible for Requirements Elicitation must Invite all parties to the Requirements Elicitation Workshops (See list of Stakeholders for your project.) Invitations must be sent between 2 and 4 weeks before the planned start of the workshop. The Workshop may only be led by a person with a grade xyz qualification.

Target Profiles are Equivalent to Maturity Levels

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Process Area	Maturity Level	Capability Level				
		1	2	3	4	5
Requirements Management Measurement and Analysis Project Monitoring and Control Project Planning Process and Product Quality Assurance Supplier Agreement Management Configuration Management	2		Target Profile 2			
Requirements Development Decision Analysis and Resolution Product Integration Technical Solution Validation Verification Organizational Process Definition Organizational Process Focus Integrated Project Management Risk Management Organizational Training	3		Target Profile 3			
Organizational Process Performance Quantitative Project Management	4		Target Profile 4			
Organizational Innovation and Deployment Causal Analysis and Resolution	5		Target Profile 5			

Staged Representation

Continuous Representation

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Conclusions

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CMMI is supportive of Process Improvement. CMMI does not prescribe how work has to be done, but it does define what has to be achieved to reach defined levels of maturity or capability.

Goals are set that must be achieved. Practices are suggested that are expected to be present, but these may be replaced with other practices. This allows much freedom of implementation and makes CMMI applicable and useful over a wide range of applications.

To achieve conformance to CMMI it is suggested that processes be developed and linked to the relevant parts of CMMI. In this way conformance is easily shown, and improvements can be managed in an orderly manner.