1.Standardization of software processes

1.1 Intro

3 factors in SD:

- People
- process
- technology

Process models are being developed as soon as the process has gained acceptance, cause organizations try to improve SW quality by improving the process of development

1.2 What is PM?

Structured collection of practices proven by experience that describe the characteristics of processes.

Why is used:

- to set objectives and priorities
- ensure stable, capable and mature processes
- as a guide for improvements.
- diagnose/certify current practices state of an organization.

1.3 Capability Maturity Model Integration (CMMI)

Developed in 80s for DoD, success caused the need to develop other CMMs

CMMI integrates some CMMs.

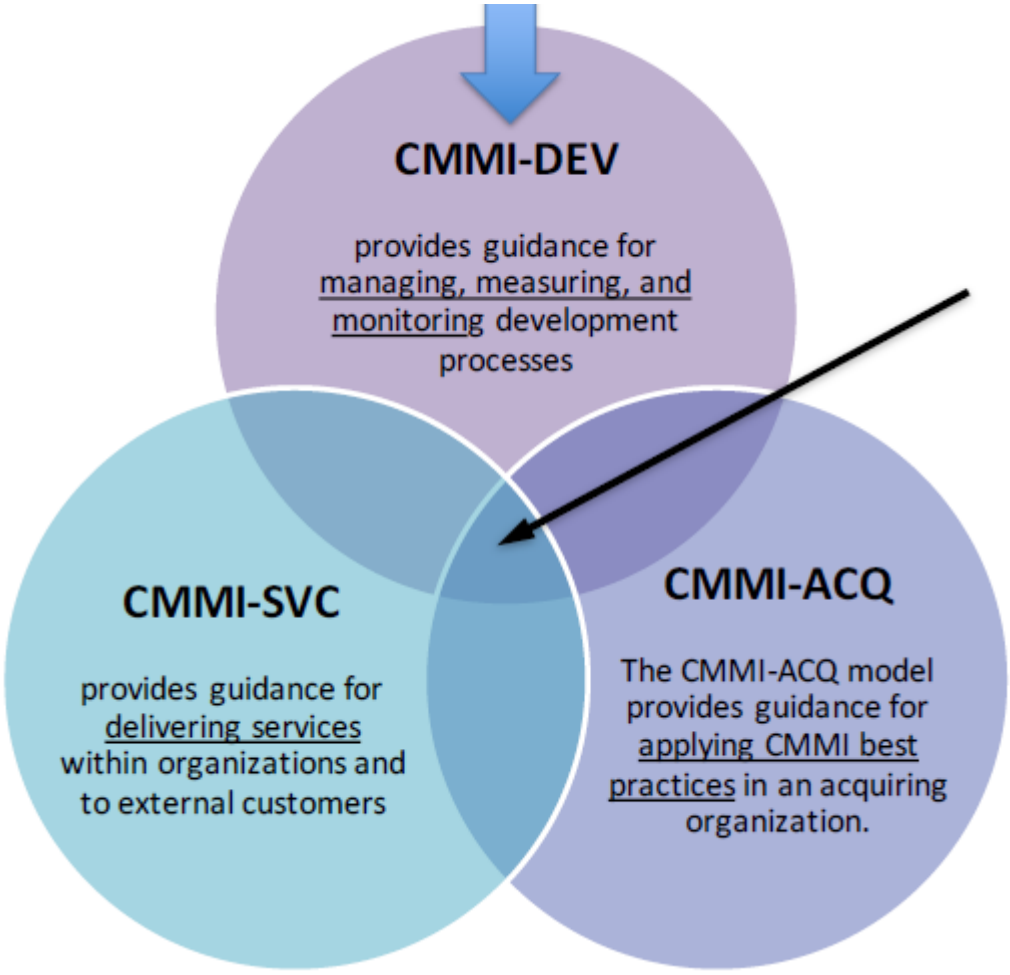
process improvement approach for essential elements of effective processes for organizations.

can be used as:

- collection of best practices (described in models, of different areas of interest).

- framework (structure that organizes the components that are organized in constellations) to organize/prioritize.

1.3.1 Constellations

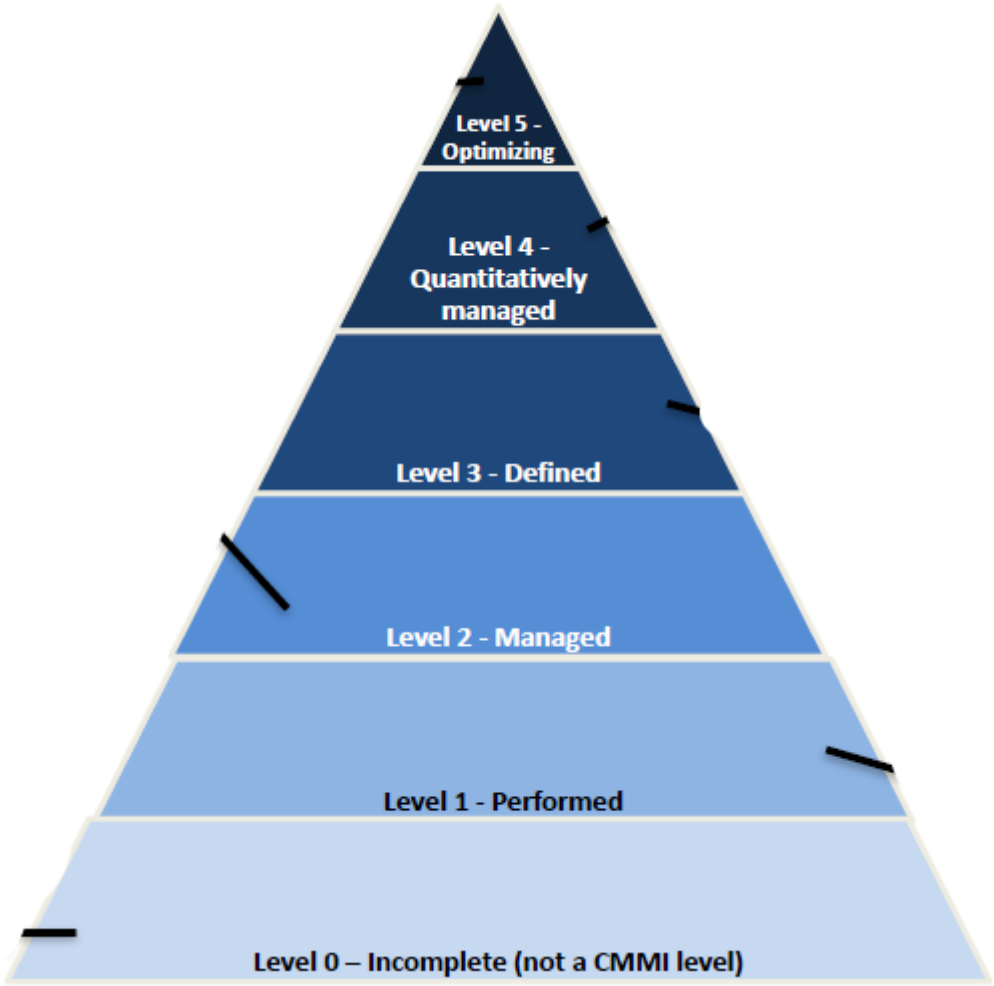


- CMMI-DEV help to manage, measure and monitor dev procs.
- CMMI-SVC help to deliver services
- CMMI-ACQ help to apply CMMI best practices in an acquiring organization

In the intersections there are 16 share Core process Areas

1.Causal Analysis and Resolution (CAR)
2.Configuration Management (CM)
3.Decision Analysis and Resolution (DAR)
4.Integrated Project Management (IPM)
5.Measurement and Analysis (MA)
6.Organizational Innovation and Deployment (OID)
7.Organizational Process Definition (OPD)
8.Organizational Process Focus (OPF)
9.Organizational Process Performance (OPP)
10.Organizational Training (OT)
11.Project Monitoring and Control (PMC)
12.Project Planning (PP)
13.Process and Product Quality Assurance (PPQA)
14.Risk Management (RSKM)
15.Quantitative Project Management (QPM)
16.Supplier Agreement Management (SAM)

1.3.2 Capability levels



0 → (not a CMMI level)Incomplete (not performed or partially performed, one or more specific goals are not satisfied, there is no reason to institutionalize a level for this).

1 → Performed (satisfies the goals)

2 → Managed (basic infrastructure in place to support the process, respect policy, employs skilled people, monitored, reviewed, controlled and evaluated)

3 → Defined (tailored according to organization standard, contributes work products, measures, etc)

4 → Quantitatively managed (control with statistical and other quantitative techniques, respect quality and performance objectives)

5 → Optimizing (improved based on an understanding of the causes of variation inherent in the process, focus on continually improving)

1.3.3 Process Areas

All CMMI models contain multiple PAs, generic goals and practices apply to all PA (each has 1 to 4 goals)

1.3.4 5 Maturity Lavels

1 → Initial

2 → Managed

3 → Defined

4 → Quantitatively managed

5 → Optimizing

1.4 Standards

1.4.1 ISO 12207 standard for sw lifecycle processes

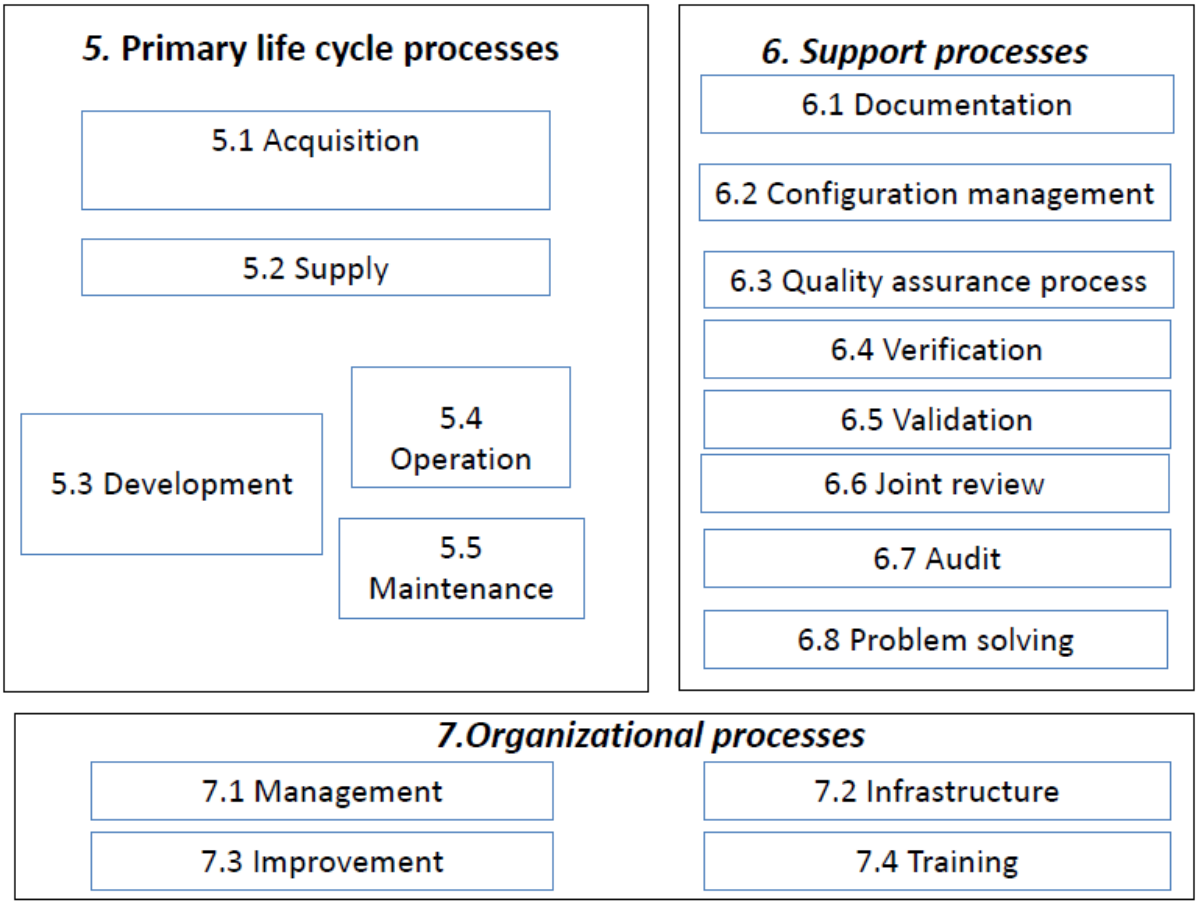
Define and structures all the activities involved in the SDP, provide a common language, based on a functional approach: set of activities transform input to output

5 lifecycle processes related to primary agents (buyers, devs etc.)

8 supporting processes

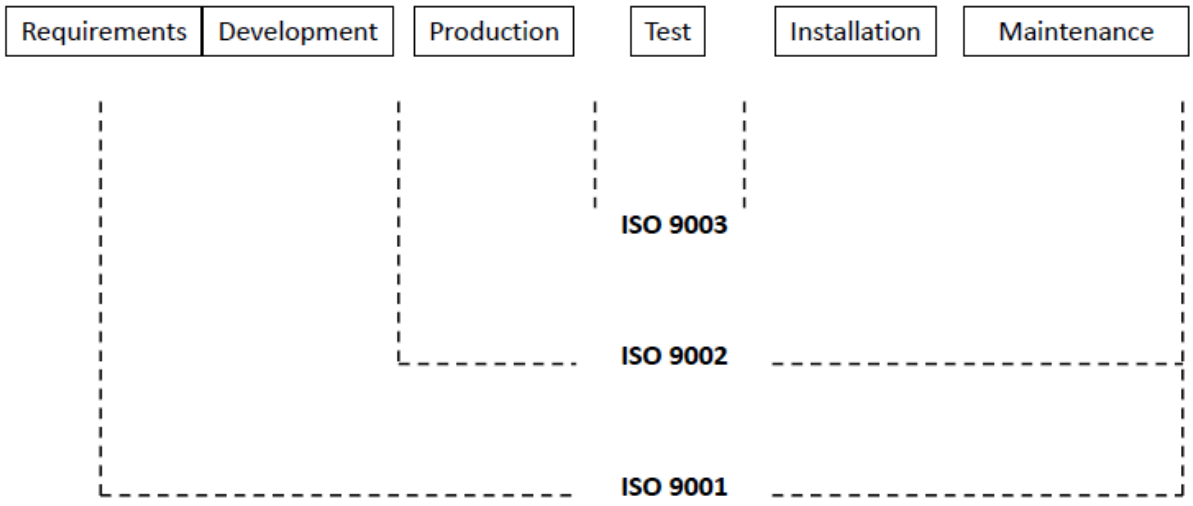
4 organizational processes

based on modularity(minimum coupling and maximum cohesion) and responsibility(estabilish a respons for each, facilitating the application of the standard)



1.4.2 ISO 9000 family for quality management systems

Before 2000 the standard was split in 3 pieces



- ISO 9000: describes fundamentals, contains the core language of the standards and detailed explanations of the quality management principles.
- ISO 9001: intended for being used in any organization needs, provides requirements (of quality management system) needed to achieve customer satisfaction and for continual improvements.

  It is the target of the certification process.
- ISO 9004: guide to performance improvement, gives advices on what an organization could do to enhance a mature system
- ISO 9011: guide to perform internal and external audits, will help ensure quality management system

1.4.2.1 ISO 9001 certification

- Perceived advantages:
  - better efficiency
  - continual impr
  - less waste
  - control of key processes
  - reduction in insurance premiums

    - vehicle for training new employees
    - manag of risk
    - increasing **world-wide recognition**
- Disadvantages:
    - abstract
    - cost
    - hard to obtain
    - too much time for develop
    - staff and organiz resistance to change
    - hard to mantain
    - more documentation

1.4.3 Fundamental building blocks

1)Quality management system

deals with requirements: how the processses interact each other, resources needed, how to measure and monitor, documentation needed and how to control it

2)Management responsibility

know customers reqs., set policies and objectives, plan how to met objectives, ensure clear communications

3)Resource management

deals with the people and physical resources, people have to be competent, physical resources and work environment need to be capable of ensuring reqs.

4)Product/Service realization

deals with the processes necessary to produce the product or to provide the service

5)Measurement, analysis and improvement

deals with measurements to enable the system to be monitored for performing internal audits, if the processes are effective, if satisfy customer reqs.

Has to improve systems and products.

The ISO certification has various accreditation bodies that have mutual agreements with
each other to ensure that certificates issued by one of the Accredited Certification Bodies (CB) are accepted worldwide; An ISO certificate is not a once-and-for-all award, but must be renewed at regular intervals recommended by the certification body, usually around three years.

Has quality requirements: a set of process requirements and resources that constitute the Quality Manual (QM) of the organization.

Documentation divided in: QM and QP