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Unit 2

IEEE/EIA 12207
Software Life Cycle Processes

Prepared by:
James W. Moore, `moorej@ieee.org`
The MITRE Corporation
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Unit 2 - ISO/IEC 12207

◆ *History*
  ◆ Purpose of 12207
  ◆ History of 12207
◆ Key concepts
◆ ISO/IEC 12207 processes

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Purpose of 12207

◆ To establish a common framework for the life cycle of software
  ◆ Acquire, supply, develop, operate, and maintain software
    ◆ Undertakes broader scope than previous standards
  ◆ Manage, control, and improve the framework
    ◆ Recognizes that software is part of a system and that a project is part of an enterprise
◆ To establish a basis for world trade in software

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Motivations for 12207

Previous standards ...

  ◆ … focused on the single contract or project in isolation
  ◆ … described a single monolithic process
  ◆ … failed to encourage investment in the discipline and capitalization of processes
  ◆ … induced 20-50% added costs in documentation and formal reviews

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Unit 2 - ISO/IEC 12207

◆ History
◆ *Key concepts*
◆ ISO/IEC 12207 processes

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Key concept of ISO/IEC 12207: Process/activity/task hierarchy

◆ Processes are subdivided into cohesive *activities*.
◆ Activities are subdivided into *tasks*.
◆ You may think of tasks as being the *specifications* for the execution of an activity.
◆ A task may be a self-declaration of intent, a requirement, a recommendation, or a permissible action.

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Key concept of ISO/IEC 12207: Processes and parties

◆ Identification of processes is based on two principles:
  - ◆ *Modularity*: Processes should be cohesive and should have *low coupling* to other.
  - ◆ *Responsibility*: Each process should be executable by a *single party*.
  - ◆ A particular *organization* may become the party responsible for executing a process

Key concept of ISO/IEC 12207: Continuing responsibilities

◆ The activities and tasks of a 12207 process are <u>not</u> steps to be performed.

◆ 12207 does <u>not</u> require that the activities and tasks are to be performed in any particular order.

◆ The activities and tasks of 12207 are *continuing responsibilities* whose execution is assigned for the duration of the process.

Key concept of ISO/IEC 12207: Categories of processes

◆ *Primary*:
  - ◆ Acquisition, Supply
  - ◆ Development, Operation, Maintenance
◆ *Supporting*: processes used as "subroutines" by other processes
◆ *Organizational*: processes inherent to the organization and "instantiated" by the project
◆ Also, a special *tailoring* process

Key concept of ISO/IEC 12207: Integral evaluation

◆ Evaluation is <u>not</u> a distinct process or activity.

◆ Evaluation is treated as an *internal, integral* task of many activities in the standard.

◆ In general, the evaluations have stated purposes and stated criteria.

◆ Other processes may supplement internal evaluations: Verification, Validation, Joint Review, Audit, Quality Assurance, Improvement.

Key concept of ISO/IEC 12207: Temporal issues

◆ The standard does <u>not</u> specify a life cycle *model*, e.g. waterfall, spiral, etc.

◆ The standard does <u>not</u> place ordering dependencies or time dependencies on the tasks → that is the job of the chosen life cycle model and the project plan.

◆ Tasks may be iterated, repeated, recursively invoked, etc.

Key concept of ISO/IEC 12207: Approach to documentation

◆ The standard requires some outputs to be documented.

◆ The standard does <u>not</u> prescribe format, media, or content of the documentation.

◆ The Documentation Process permits the user to make these decisions.

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Key concept of ISO/IEC 12207: Approach to baselining

◆ Standard differentiates between *items* and *configuration items* (CI). The CM process can handle both, but the latter are handled more rigorously.

◆ A ***baseline*** is a formally approved version of a CI. Baselines (as clarified by the IEEE/EIA version) are established by the primary processes, <u>not</u> by the CM process.

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Unit 2 - ISO/IEC 12207

◆ History
◆ Key concepts
◆ *ISO/IEC 12207 processes*

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ISO/IEC 12207 processes

◆ Primary
◆ Supporting
◆ Organizational

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ISO/IEC 12207 processes: Primary processes

◆ Primary processes are executed by parties who initiate or perform major roles in the software life cycle:

◆ Acquisition	◆ Development
◆ Supply	◆ Operation
	◆ Maintenance

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ISO/IEC 12207 processes: Supporting processes

◆ A supporting process supports another process as an integral part with a distinct purpose:

◆ Documentation	◆ Validation
◆ Configuration Management	◆ Joint Review
◆ Quality Assurance	◆ Audit
◆ Verification	◆ Problem Resolution

◆ But *fundamental responsibility* remains integral to the *primary* process.

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ISO/IEC 12207 processes: Organizational processes

◆ Organizational processes inherently exist <u>outside</u> the scope of the project but *instances* of them are employed by the project:

◆ Management
◆ Infrastructure
◆ Improvement
◆ Training

ISO/IEC 12207 processes: Tailoring process

- ◆ A special case
- ◆ The tailoring process is used to tailor the standard for usage on a particular project.
- ◆ Tailoring permits deletion of any process, activity or task.
- ◆ (Tailoring is discouraged in the IEEE/EIA adaptation of the standard.)