

Software Process and Software Life Cycle

Key words:

- ◆ **Software life-cycle**
 - Phases
 - Development cycle and evolution cycle
- ◆ **Software process**
 - Discipline, activities, roles, and artifacts
- ◆ **Iterations**
 - Milestones
- ◆ **UPEDU**
 - RUP, standards and models.

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Software Process and Software Life Cycle

- ◆ **Understanding the Development and Evolution of Software**
- ◆ **Defining the Software Life Cycle and the Software Process**
- ◆ **Defining Elements of the Software Process**
- ◆ **Integrating the Software Life Cycle and the Software Process**
- ◆ **Customizing the Software Process**
- ◆ **Summary**

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Process of Building a House



Same life cycle





Different Process

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Software Process and Software Life Cycle

- ◆ **Understanding the Development and Evolution of Software**
- ◆ **Defining the Software Life Cycle and the Software Process**
 - The Software lifecycle
 - The Software process
- ◆ **Defining Elements of the Software Process**
- ◆ **Integrating the Software Life Cycle and the Software Process**
- ◆ **Customizing the Software Process**
- ◆ **Summary**

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Phases of the Development Cycle

Inception - Define the scope of project
Elaboration - Plan project, specify features, baseline system
Construction - Build the product
Transition - Transition the product into end user community

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Each Phase is Marked by Milestones

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Cycles are not Strictly Sequential

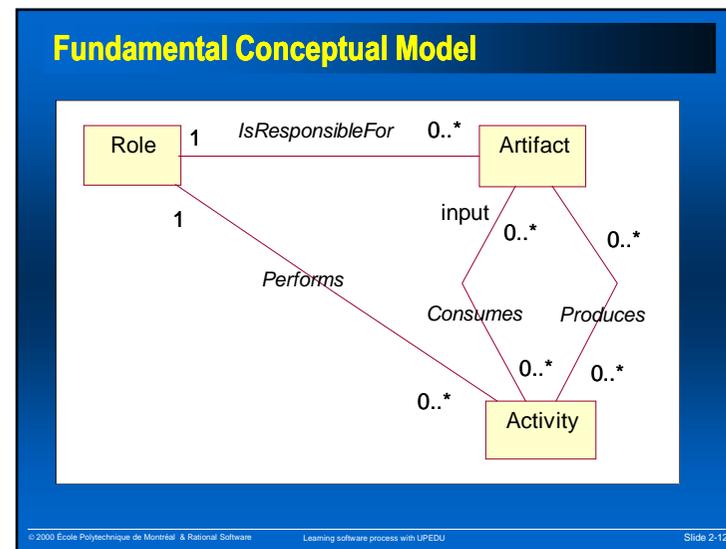
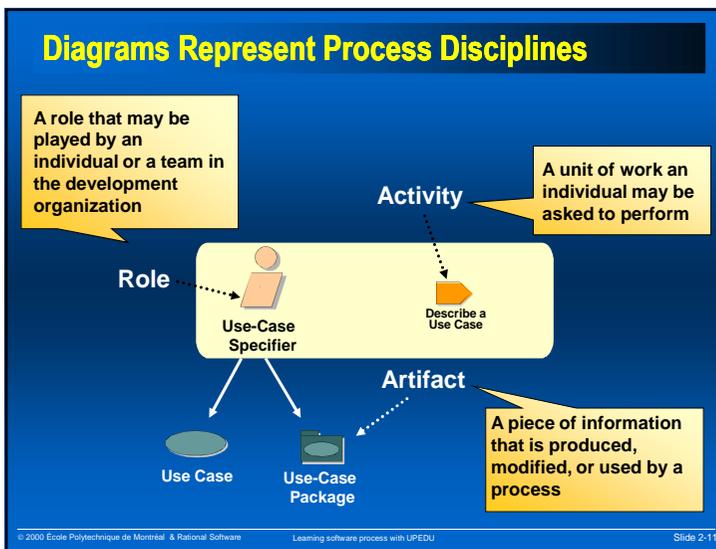
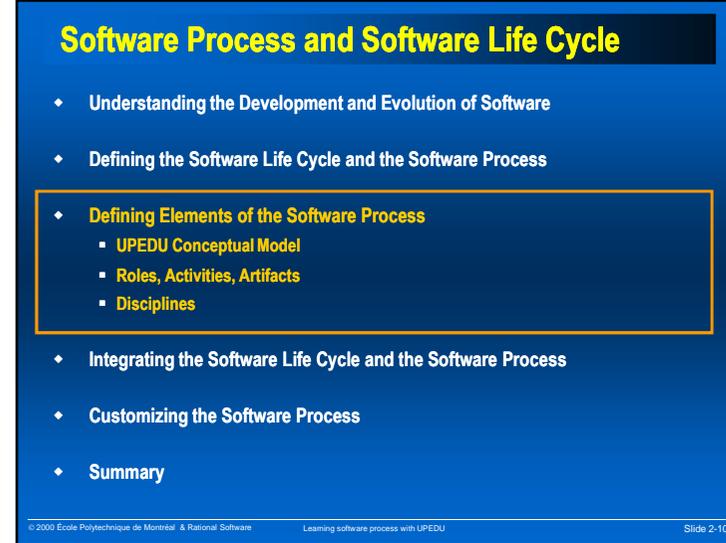
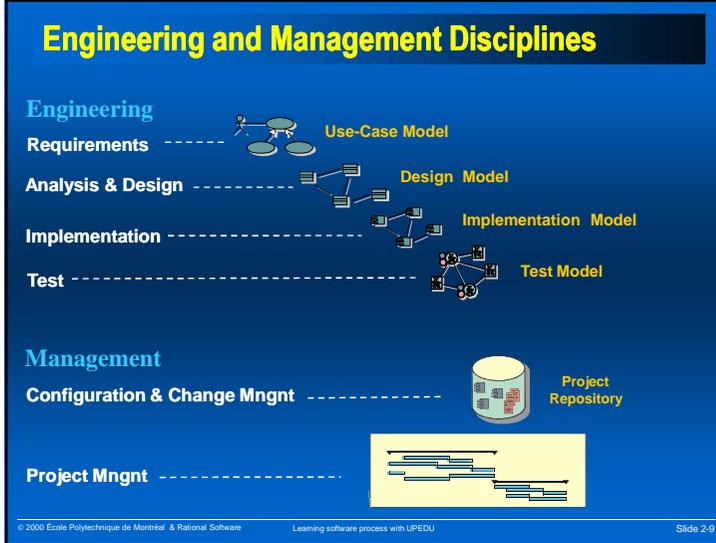
- ♦ An **evolution cycle** includes one execution of all four phases and produces a **software generation**
- ♦ **Most software systems require multiple cycles**
 - An initial development cycle leading to the initial delivery
 - Subsequent evolution cycles to maintain and enhance the system
- ♦ Cycles may be **sequential**, but more commonly **overlap**

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Who is doing What, When, and How

Provides guidelines for efficient development of software
Reduces risk and increases predictability
Captures and presents best practices
Promotes common vision and culture

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Dividing the Work by Activities

The diagram illustrates the role of a System Analyst, represented by an icon of a person and a document. Four orange arrow-shaped boxes point to the right, each representing a specific activity: 'Capture a Common Vocabulary', 'Manage Dependencies', 'Find Actors and Use Cases', and 'Develop Vision'.

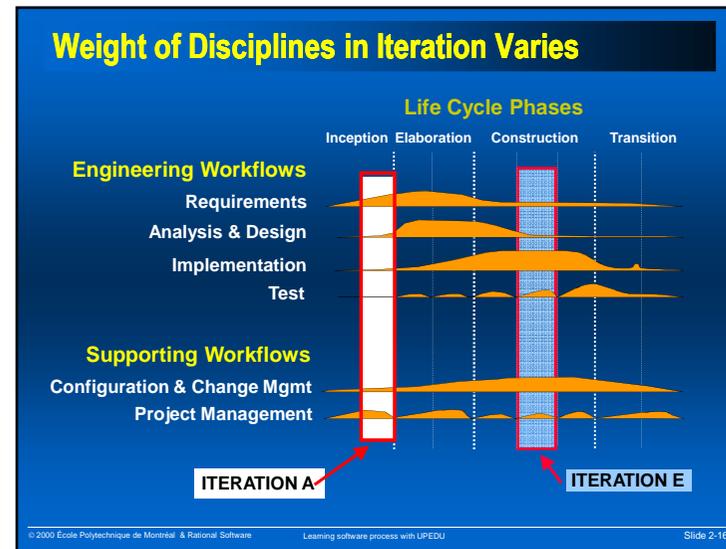
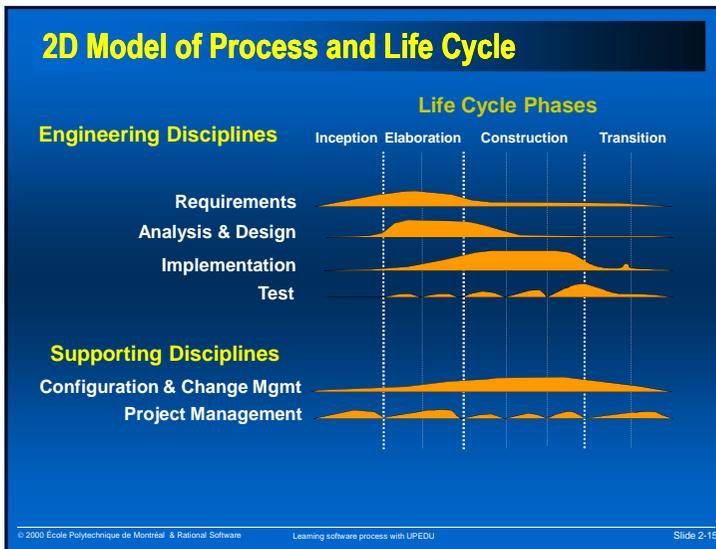
UPEDU Guideline: Process Discriminant

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Software Process and Software Life Cycle

- Understanding the Development and Evolution of Software
- Defining the Software Life Cycle and the Software Process
- Defining Elements of the Software Process
- Integrating the Software Life cycle and the Software Process**
 - Disciplines and Phases
 - Iterations
 - Opportunistic and Systematic Activities
- Customizing the Software Process
- Summary

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Artifacts Evolve in the Development Cycle

Inception **Elaboration** **Construction** **Transition**

M R D I M R D I M R D I M R D I

☒ M : Management artifacts
 ☐ R : Requirements artifacts
 ☒ D : Design artifacts
 ☐ I : Implementation artifacts

An **iteration** is a distinct sequence of activities with an established plan and evaluation criteria resulting in a modified artifacts

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Systematic or Opportunistic Iterations

Possible opportunistic sequences

Opportunistic

Systematic sequences

MRDI

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- Integrating the Software Life cycle and the Software Process
- Customizing the Software Process**
 - Influential Factors in Customizing Software Process
 - Software Process Standards and Models
- Summary

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Four Influential Factors

Product Life Cycle Application Domain

Process People and Organization

CMM ISO 15504

UPEDU Concept: Tailoring the Process

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Software Process Standards and Models

◆ IEEE std 1074-1995 processes

- Project management
- Pre-development
- Development
- Post-development
- Integral

◆ Models

- Waterfall
- Spiral
- Incremental
- Prototyping

UPEDU Concept: Effects of implementing a Process

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Wrap up

- ◆ Software process versus Software life-cycle
- ◆ The phases of a software life-cycle
- ◆ The disciplines of a software process
- ◆ The components of a discipline
- ◆ Development cycle vs evolution cycle
- ◆ Interaction between the disciplines and the phases
- ◆ Iterations and software processes
- ◆ Various models and standard on software process and software life-cycle

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