

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

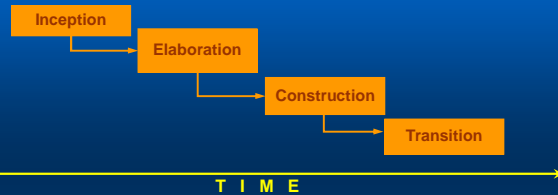
- ♦ **Understanding the Development and Evolution of Software**
- ♦ **Defining the Software Life Cycle and the Software Process**
 - The Software lifecycle
 - The Software process
- ♦ **Defining Elements of the Software Process**
- ♦ **Integrating the Software Life Cycle and the Software Process**
-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

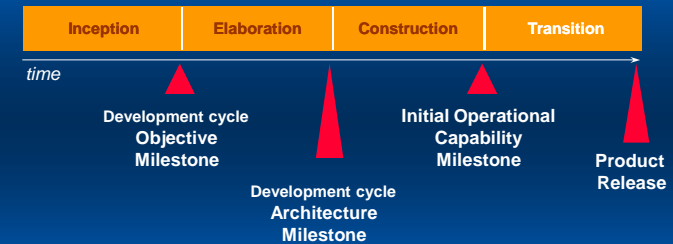
Transition - Transition the product into end user community

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Each Phase is Marked by Milestones



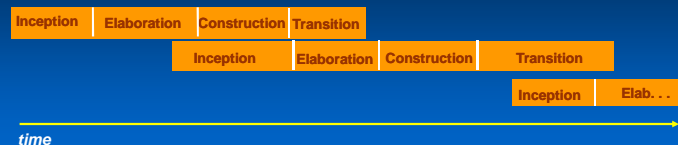
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Cycles are not Strictly Sequential

- ♦ 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

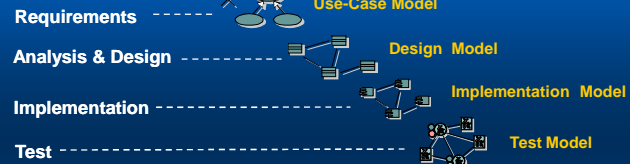
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Engineering and Management Disciplines

Engineering



Management



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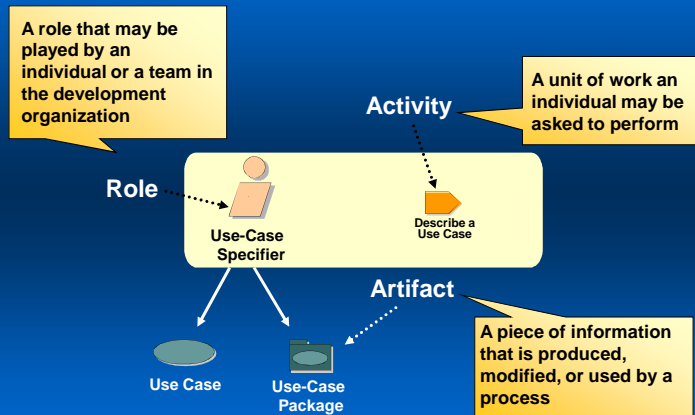
- Understanding the Development and Evolution of Software
- Defining the Software Life Cycle and the Software Process
- Defining Elements of the Software Process
 - UPEDU Conceptual Model
 - Roles, Activities, Artifacts
 - Disciplines
- Integrating the Software Life Cycle and the Software Process
- Customizing the Software Process
- Summary

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Diagrams Represent Process Disciplines

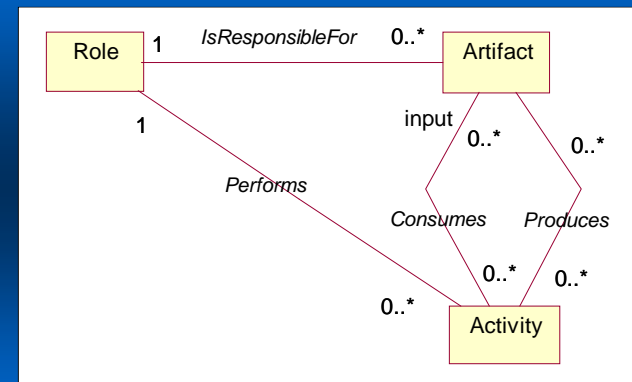


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Fundamental Conceptual Model

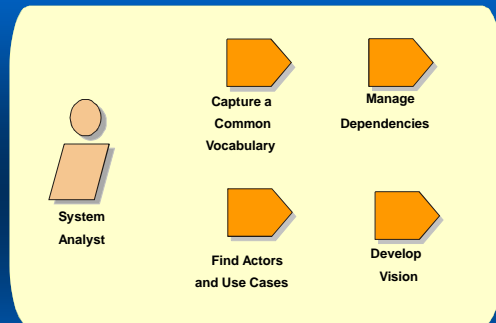


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Dividing the Work by Activities



UPEDU Guideline: Process Discriminant

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Software Process and Software Life Cycle

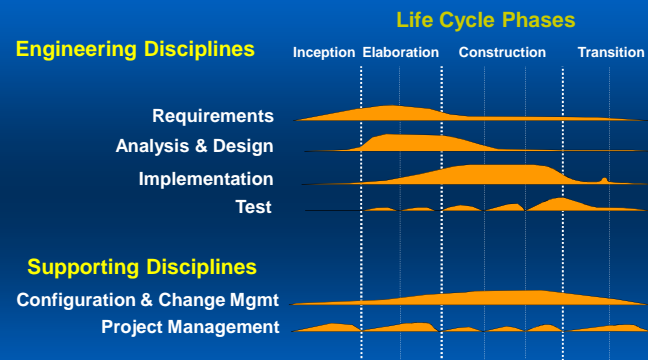
- ♦ Understanding the Development and Evolution of Software
- ♦ Defining the Software Life Cycle and the Software Process
- ♦ Defining Elements of the Software Process
- ♦ Integrating the Software Life cycle and the Software Process
 - Disciplines and Phases
 - Iterations
 - Opportunistic and Systematic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

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2D Model of Process and Life Cycle

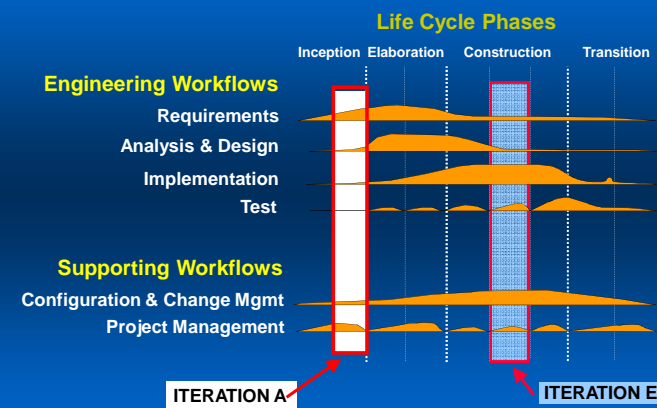


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Weight of Disciplines in Iteration Varies

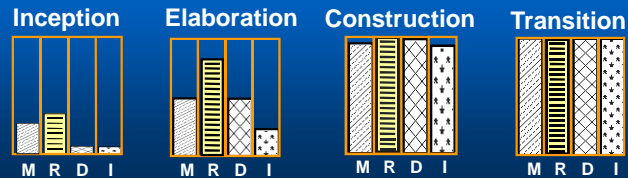


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Artifacts Evolve in the Development Cycle



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 an modified artifacts

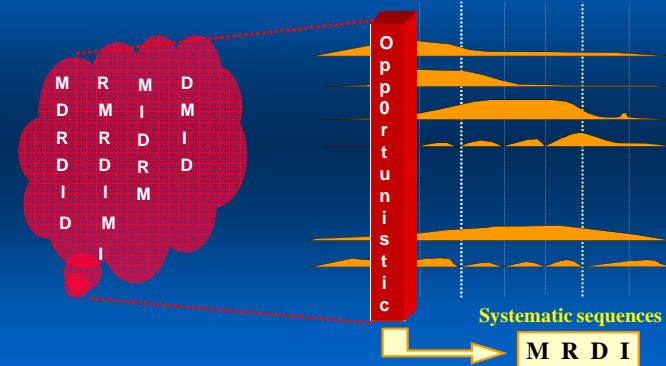
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Systematic or Opportunistic Iterations

Possible opportunistic sequences



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- 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**
 - 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



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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♦ Summary

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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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