Software Engineering (20CS440)

The Presentation Slides are Influenced by the Text Book *Software Engineering: A Practitioner's Approach, 8/e* (McGraw-Hill)

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Unit I : Software Process

(Software and Software Engineering)

Chapter 1:The Nature of Software

Chapter 2: Software Engineering

Chapter 3: Software Process Structure

Chapter 4: Process Models

Chapter 3: Software Process Structure

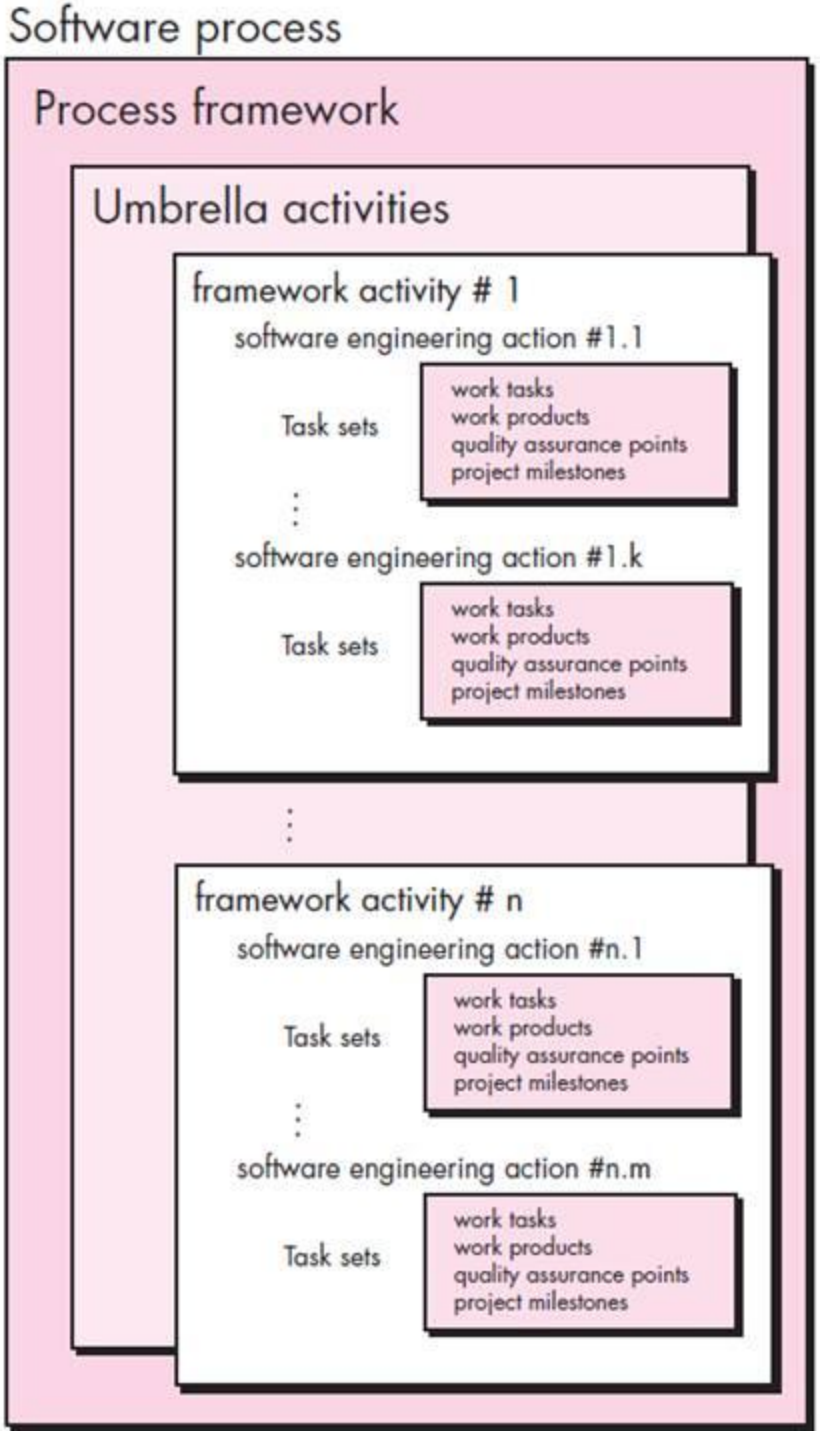
- 3.1 A Generic Process Model
- 3.2 Defining A Framework Activity
- 3.3 Identifying A Task Set

3.1 A Generic Process Model

- **Framework**
- SP : **approach** for software engineering.
- Process framework **5 activities** -communication, planning, modeling, construction, and deployment.

- **Set of umbrella activities-** project tracking and control, risk management, quality assurance, configuration management, technical reviews, and others.
- A **framework** for the **activities, actions, and tasks** that are required to build high-quality software.

FIGURE 3.1: A software Process framework



3.1 A Generic Process Model

- **Process Flow (Important Aspect)**
- Framework activities, actions and tasks organized w. r.t sequence and time.

FIGURE 2.2 Process flow

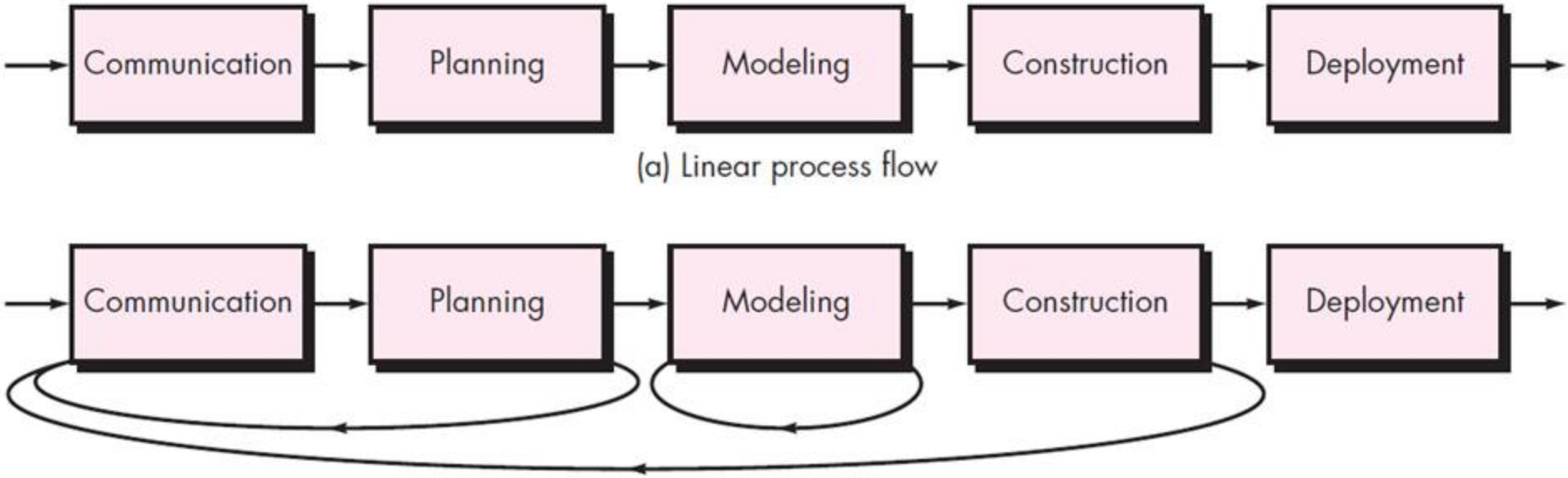
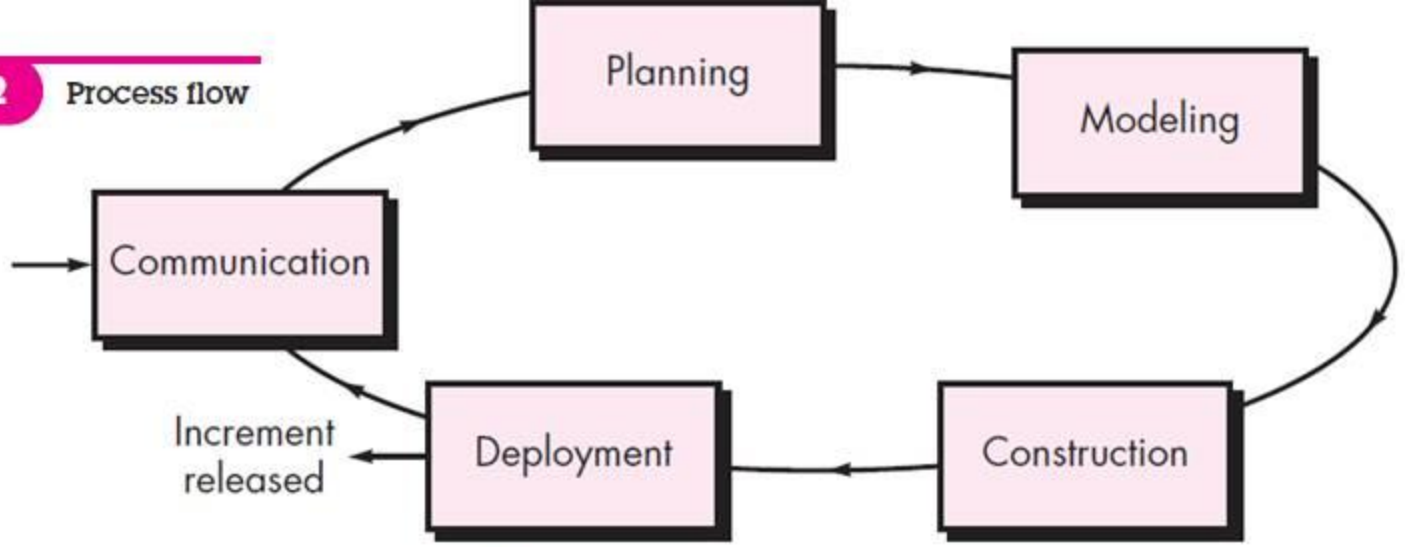
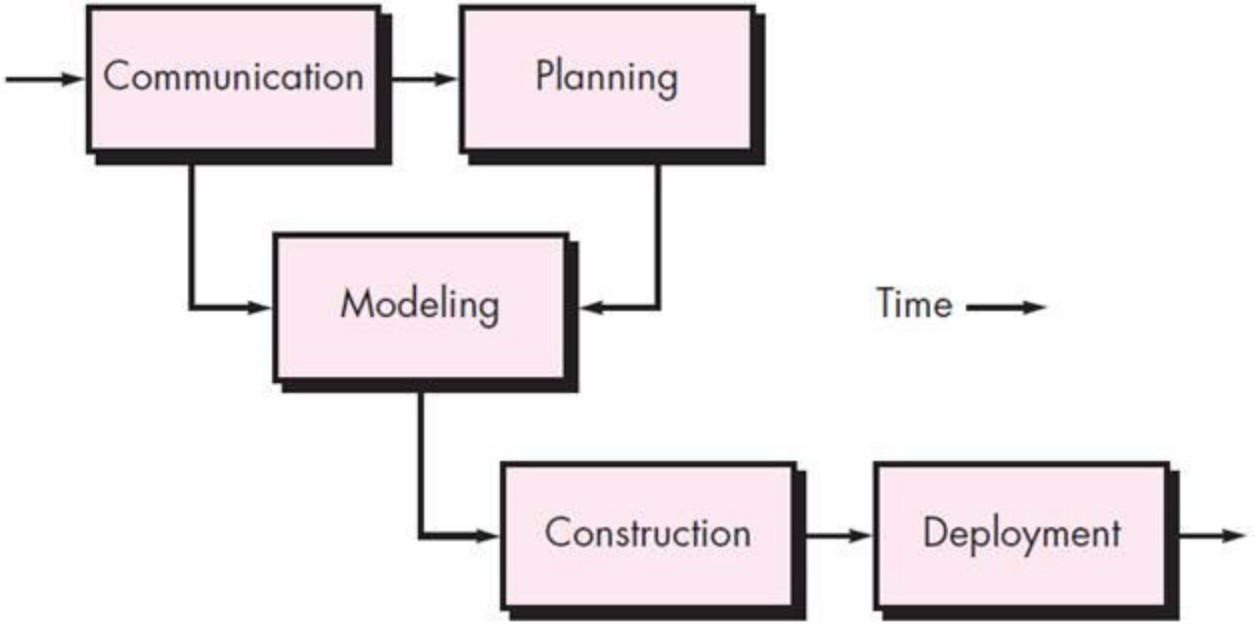


FIGURE 2.2 Process flow



(c) Evolutionary process flow



(d) Parallel process flow

3.1 A Generic Process Model

- **Process Flow**
- **Linear process flow** executes each of the five activities in sequence.
- An **iterative process flow** repeats one or more of the activities before proceeding to the next.

- An **evolutionary process flow** executes the activities in a circular manner.
- A **parallel process flow** executes one or more activities in parallel with other activities.

3.2 Defining A Framework Activity

- What **actions** are appropriate for a framework activity given the nature of the problem, the characteristics of the people and the stakeholders?

- A task set defines the actual work to be done to accomplish the objectives of a software engineering action.
  - A list of the task to be accomplished
  - A list of the work products to be produced
  - A list of the quality assurance filters to be applied

3.2 Defining A Framework Activity

- Ex1: Small software project by 1 person then, communication activity might encompass **phone conversation action**. The work tasks of this action are:

1. Make contact with stakeholder via telephone.
2. Discuss requirements and take notes.
3. Organize notes into a brief written statement of requirements.
4. E-mail to stakeholder for review and approval.

3.2 Defining A Framework Activity

- Ex2: Simple project
- The task sets for **Requirements gathering action for communication activity** may include:

1. Make a list of stakeholders for the project.
2. Invite all stakeholders to an informal meeting.
3. Ask each stakeholder to make a list of features and functions required.
4. Discuss requirements and build a final list.
5. Prioritize requirements.
6. Note areas of uncertainty.

3.2 Defining A Framework Activity

- Ex3: Complex project
- The task sets for **Requirements gathering action for communication activity** may include:
  1. Make a list of stakeholders for the project.
  2. Interview each stakeholders separately to determine overall wants and needs.
  3. Build a preliminary list of functions and features based on stakeholder input.
  4. Schedule a series of facilitated application specification meetings.
  5. Conduct meetings.
  6. Produce informal user scenarios as part of each meeting.
  7. Refine user scenarios based on stakeholder feedback.
  8. Build a revised list of stakeholder requirements.
  9. Use quality function deployment techniques to prioritize requirements.
  10. Package requirements so that they can be delivered incrementally.
  11. Note constraints and restrictions that will be placed on the system.
  12. Discuss methods for validating the system.
  - **All three do the same work with different depth and formality.**

3.3 Identifying a Task Set

- A task set defines the actual work to be done to accomplish the objectives of a software engineering action.

  - A list of the task to be accomplished
  - A list of the work products to be produced
  - A list of the quality assurance filters to be applied