Introduction to Project Management

Chapter 6
Managing Project Scheduling

Information Systems Project Management: A Process and Team Approach, 1e
Fuller/Valacich/George

What is Project Scheduling?

- The process of:
  - defining project activities
  - determining their sequence
  - estimating their duration
- Scheduling activities are part of project time management

Sequencing

- Requires:
  - Identification of any project technical constraints
  - Safety or efficiency considerations
  - Environmental politics
  - Availability of required resources
  - Completion of prerequisite processes

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Scheduling Process Steps

1. Creating a work breakdown structure (WBS) to identify required project components

2. Defining the activities needed to complete each of these components

3. Determining the most efficient sequencing order of these components

Schedule Development & Usage

- Schedule developed during initiation or planning stage
- Followed and updated during the execution stage
- Used for project tracking during control stage

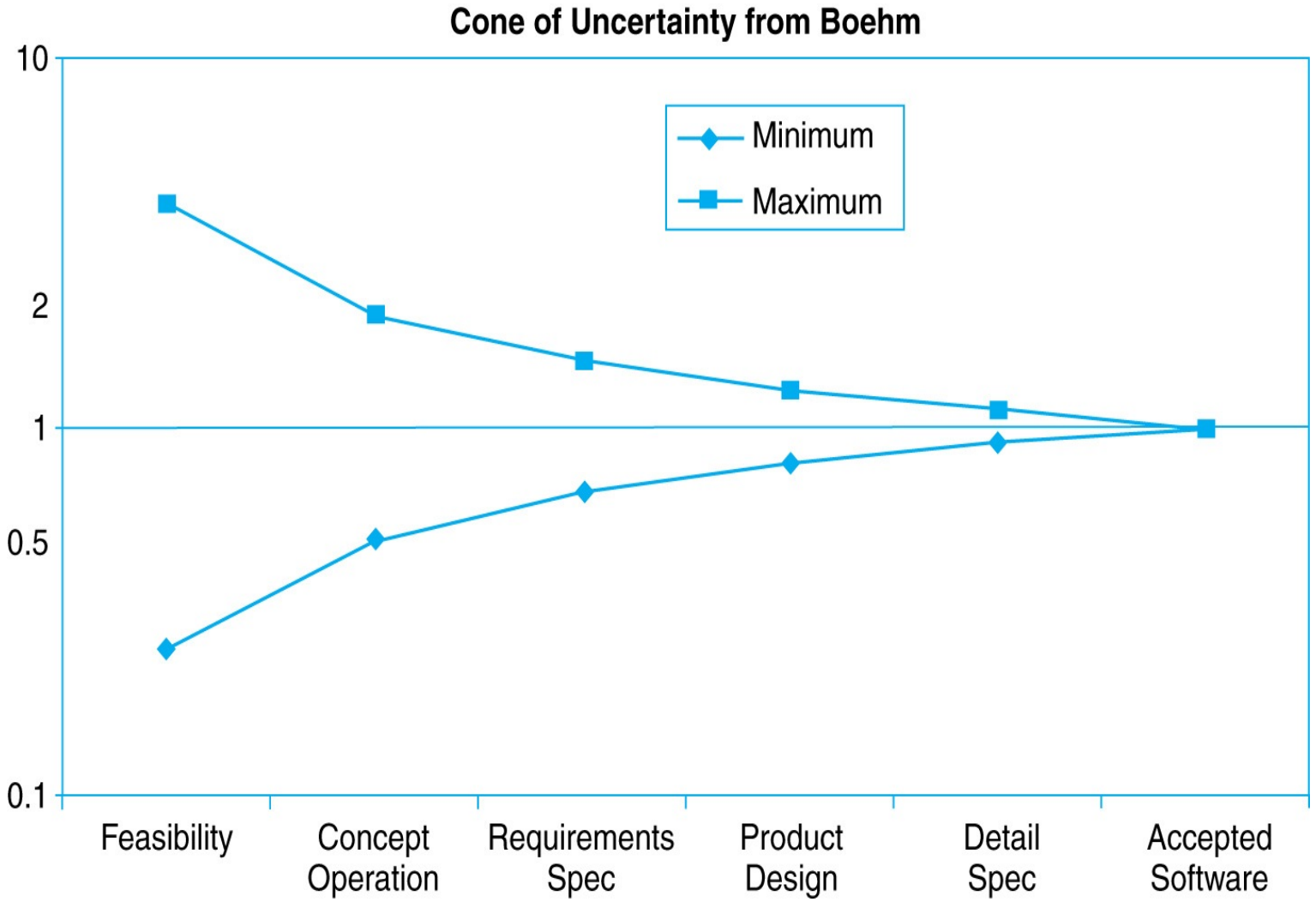
Top 5 Project Management Challenges

1. Lack of clarity in scope of the project
2. Shifting organizational priorities
3. Project changes not well managed
4. A lack of project management skills
5. Training of project sponsors

Project Schedule Modifications

- Why?
  - Business environment changes
    - Internal – change of strategic objectives
    - External – reaction to competitor actions
  - New technologies become available
  - Reaction to unforeseen events

Cone of Uncertainty



Ten Unmyths of Project Estimation

1. Accurate estimates are possible
2. Objective of estimating is to determine the end date
3. Estimate and commitment are the same
4. Project estimate is dependent on the size of the final system
5. Historical data is an accurate indicator of productivity

Ten Unmyths of Project Estimation (cont.)

6. Productivity is an accurate indicator of project duration
7. System size can be determined by the projected number of lines of code
8. Function points can be used to determine system size
9. Assigning more resources will speed up development of system
10. A defect-free system is possible given adequate time

Project Scheduling

- Impacted by:
  - Technologies
    - New and sophisticated software
    - Advancements in networking and web capabilities
  - Team processes
    - Resource availability
    - Resource allocation
    - Resource assignment
  - Scheduling creation and execution
    - Developed early
    - Followed/monitored/changed throughout project
    - Assist in determination of progress

Computer System Components

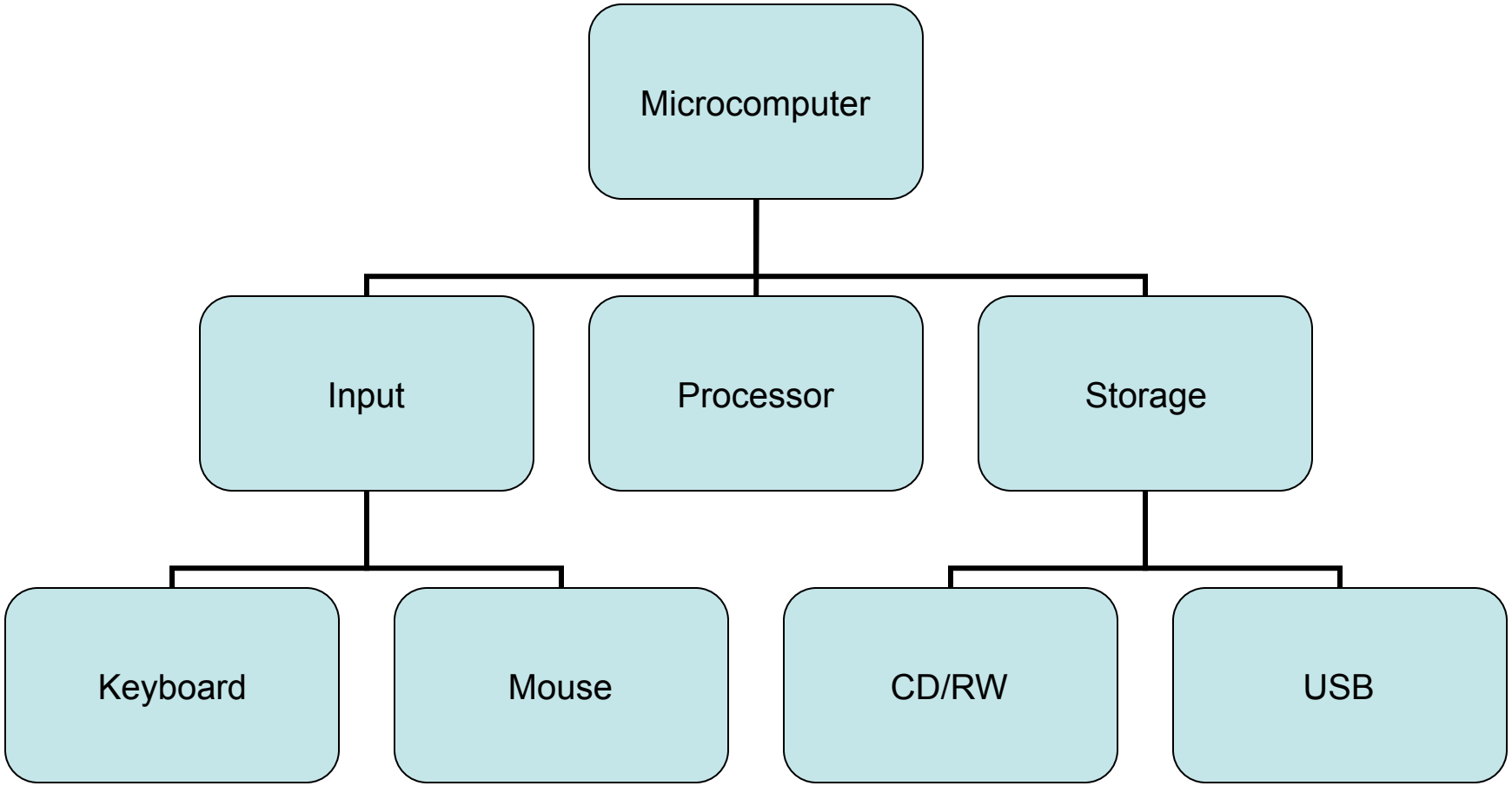
Main unit
- Housing
- Motherboard
  - CPU
  - RAM chips
- Hard Drive
- Video card
- Sound card

Monitor
- CRT
- Housing
- Electronic components

Mouse
- Body
- Marble
- Cable

Keyboard
- Keys
- Case

Product Breakdown Structure

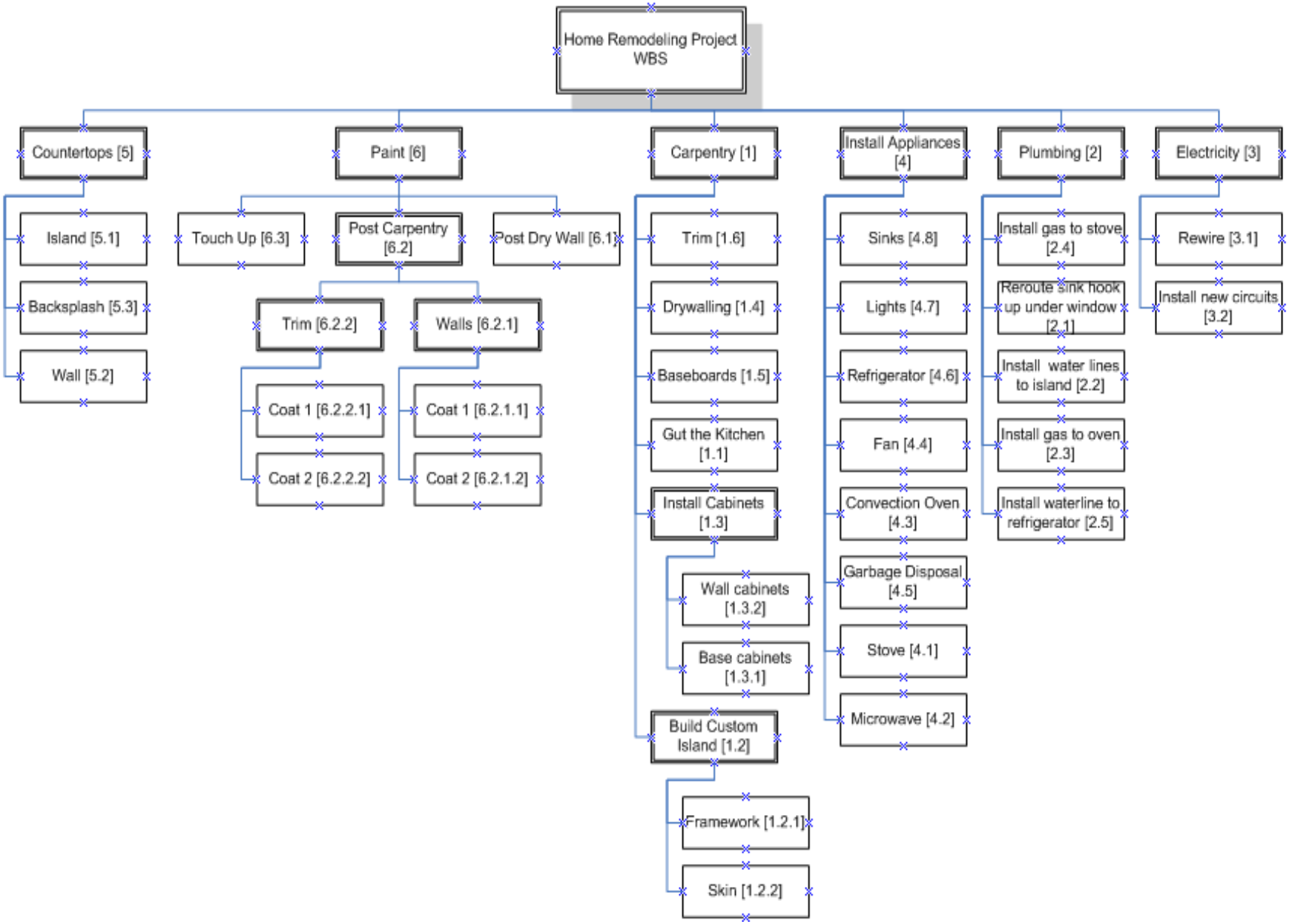


(Bill of Materials - BOM)

Work Breakdown Structure (WBS)

- Illustrates project scope
- Describes project subcomponents as:
  - Activities (verbs) – “install new plumbing”

    or
  - Deliverables (noun) – “new plumbing”



WBS Inputs

- Project scope management plan
- Project scope statement
  - Identifies deliverables
  - Major steps required to complete the project
- Experience with similar past projects
- Organizational process assets
  - Guidelines, organizational policies, procedures

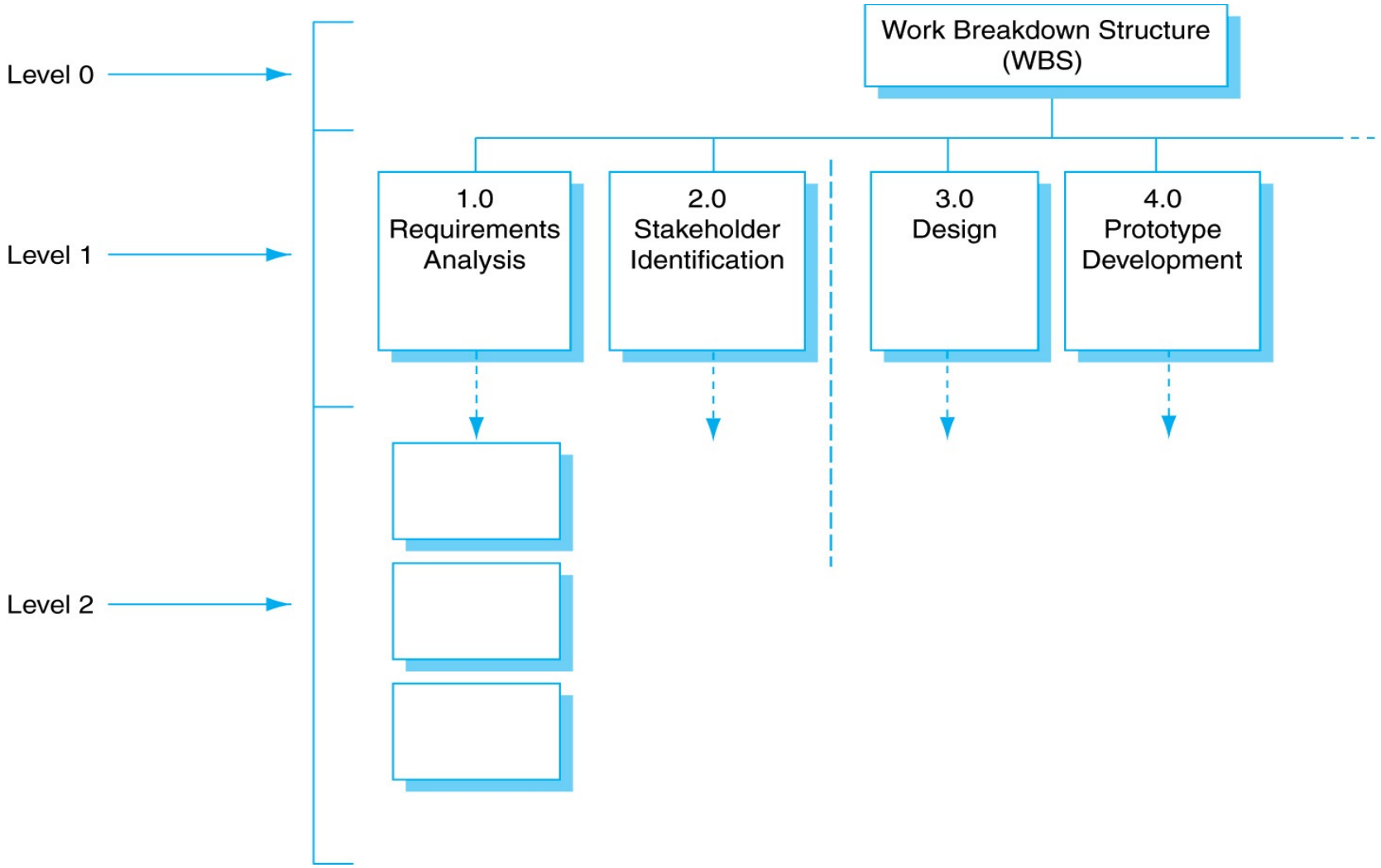
WBS Techniques

- Decomposition participation includes:
  - Project team
  - Customers
  - Subject matter experts
- Major project deliverables identified
- Codes assigned to each WBS component
  - Level 0 - project itself
  - Level 1 - major deliverables
  - Level 2 - individual components of each deliverable
  - Etc.
  - Final level – work package

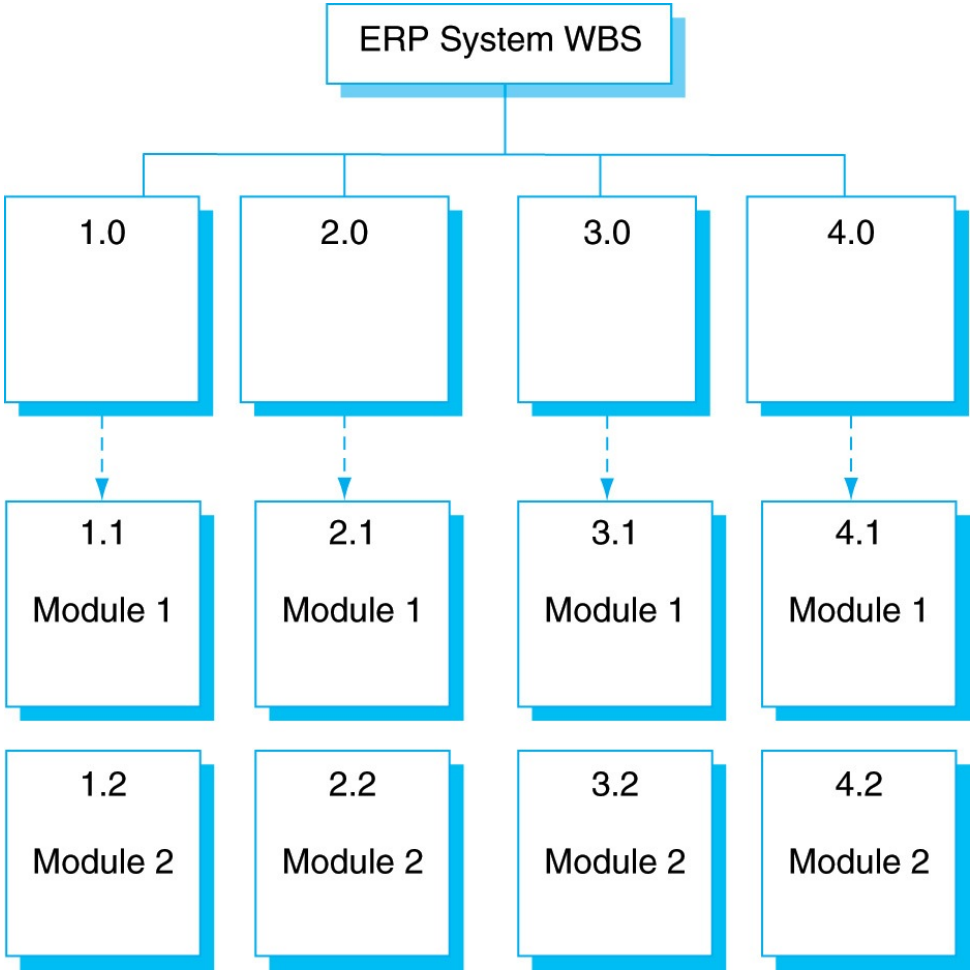
Work Package

- Lowest level of WBS
- Should contain activities that are short in duration (1 or 2 weeks)
- Work package activities can be completed by an individual or a small team
- All work packages should be similar in size or effort needed
- Provides input to scheduling and budget development

WBS Numbering System



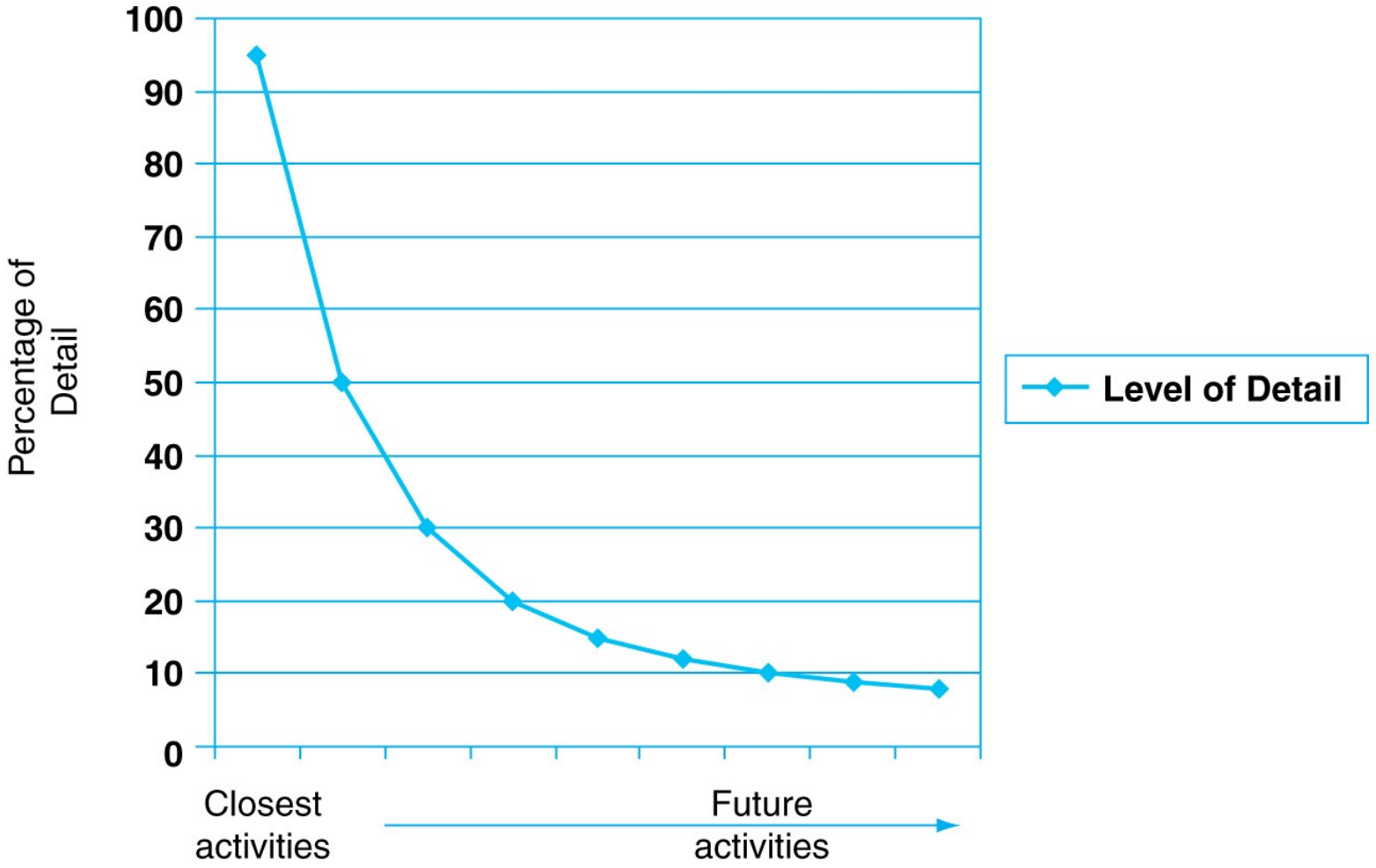
WBS for ERP System



Three Decomposition Approaches

- Top-Down – traditional method
- Bottom-up – used for unique projects
- Rolling Wave – greater decomposition occurs as project components becomes more defined over time

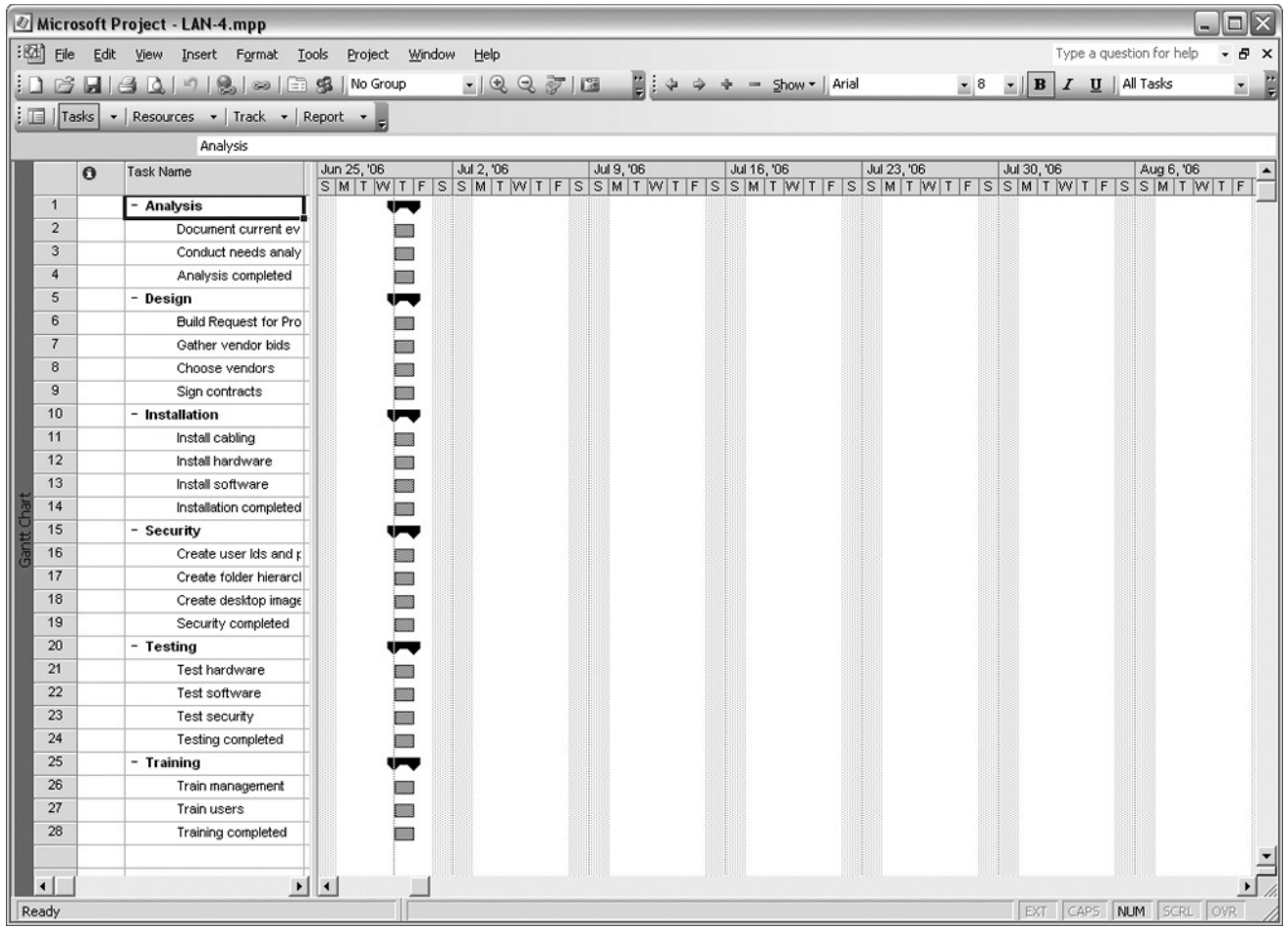
Rolling Wave Planning



WBS Tools

- Templates
- Software
  - MS Visio – displays WBS in hierarchical form
  - MS Project – WBS displayed in tabular format (Gantt Chart)

Gantt Chart View of Microsoft Project



WBS Outputs

- WBS Dictionary
  - Description of each component
  - Who is responsible for development
  - Statement of Work (SOW)
  - Important milestones
  - Estimate of costs and required resources

Outcome of WBS Development

- Possible update of project scope statement and scope management plan

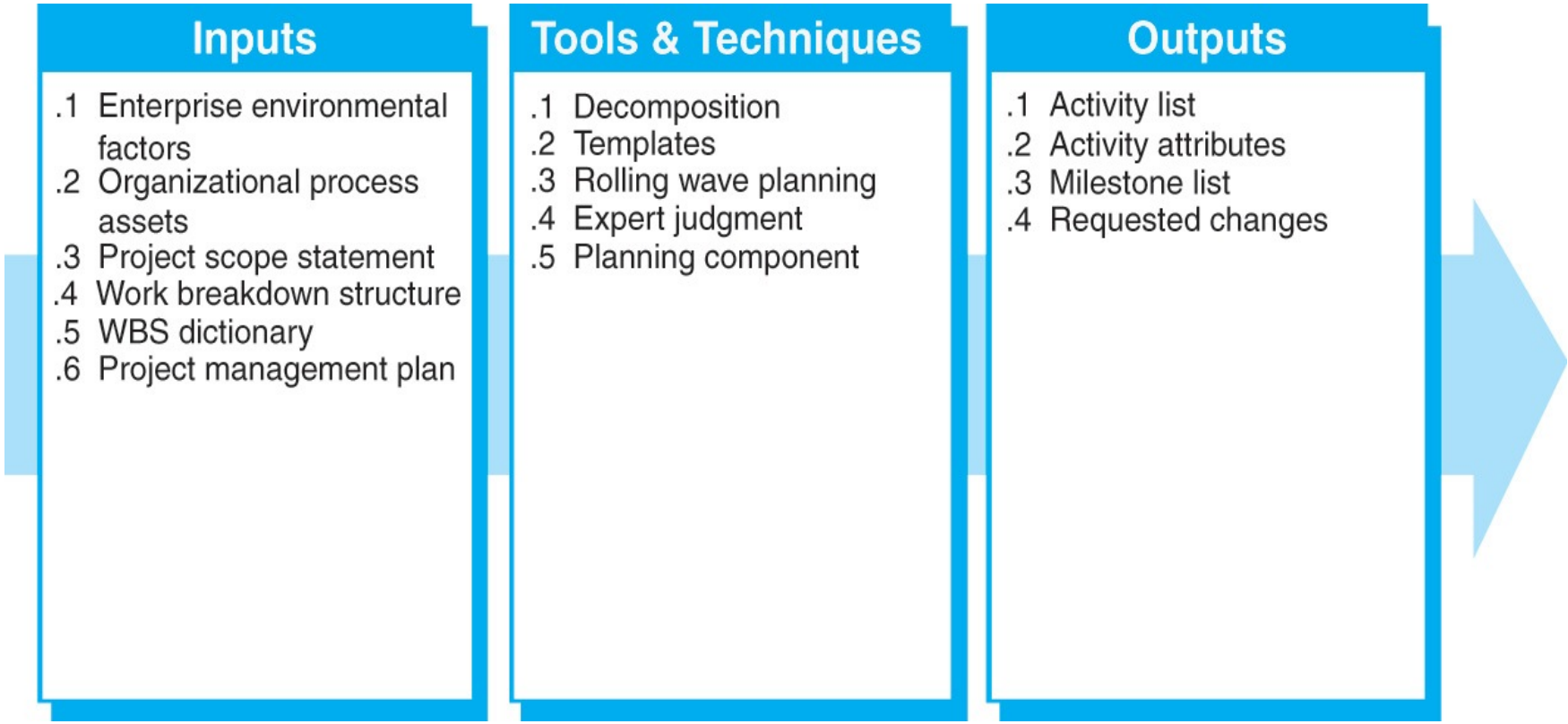
Scope Baseline

- Purpose: to determine and measure any deviations during project execution
- Components of Scope Baseline
  - Project scope statement
  - WBS
  - WBS Dictionary

Activity Definition

- Work packages broken down into discrete activities and attributes required to produce project deliverables
- Activity Definition includes:
  - Activity description
  - Resource requirements
  - Logical predecessor or successor activities

Required Inputs, Tools and Techniques Used, and Resulting Outputs During Activity Definition



How Much Activity Detail Is Required?

- Can be performed by one person or a well-defined group
- Has a single, clearly identifiable deliverable
- Has a known method or technique
- Has well-defined predecessor and successor steps
- Is measurable so that the level of completion can be determined
- Has a short duration – hours or days in length

Activity Tools & Techniques

- Templates
- Documentation from similar past projects
- Rolling wave planning can be applied

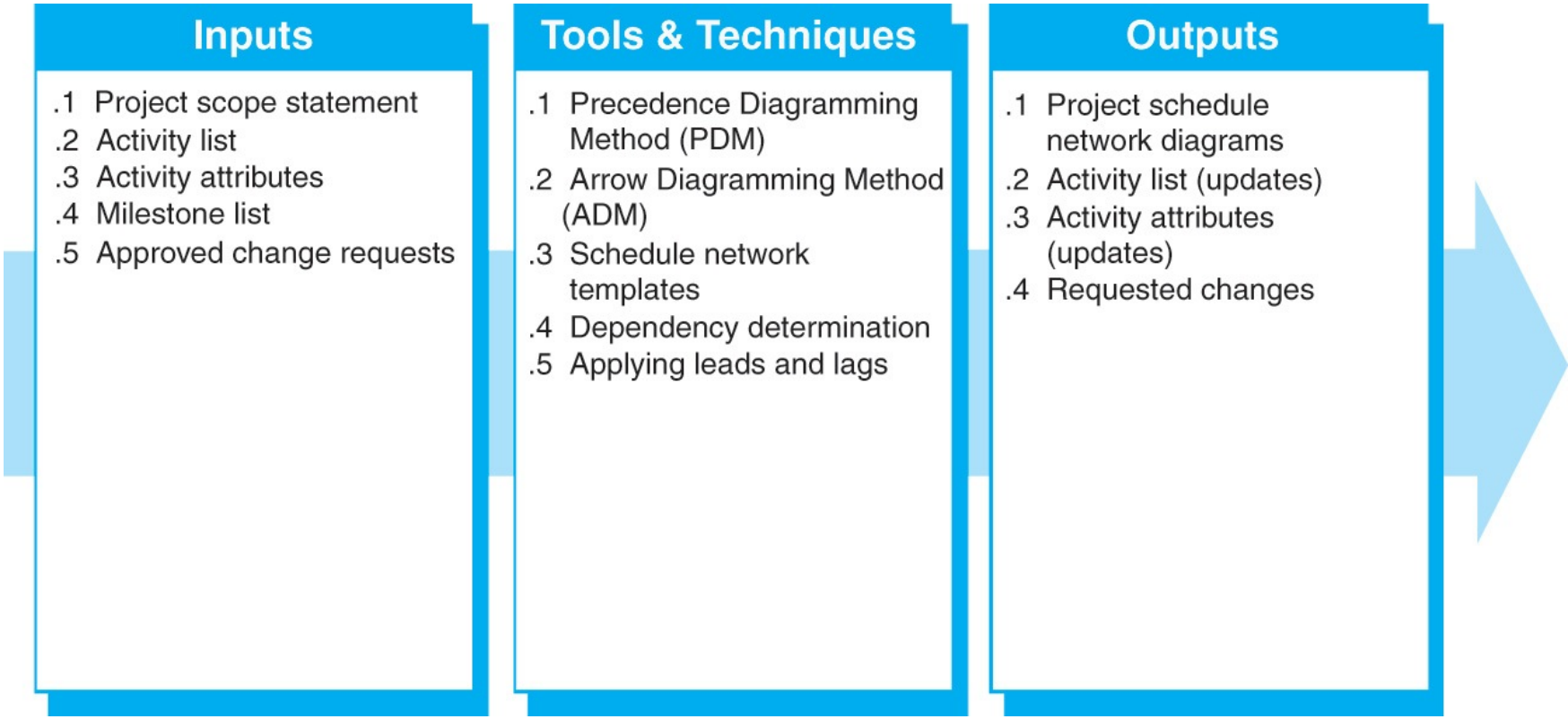
Activity Output

- Activity list
- Activity attributes
  - Description
  - Assumptions and constraints
  - Leads and lags
  - Logical relationships
  - Predecessor and successor activities
- Milestones
- Requested changes to project scope statement and WBS

Activity Sequencing

- Network diagram: a schematic display that illustrates the various activities (or tasks) in a project as well as their sequential relationships
- Sequential or parallel activity development

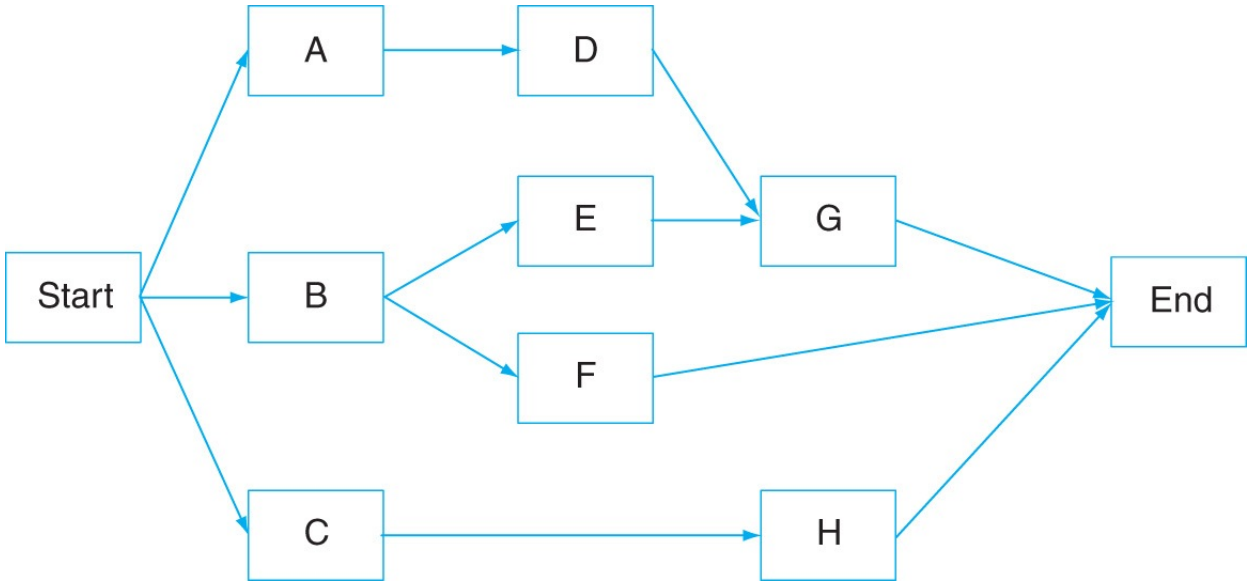
Required Inputs, Tools and Techniques Used, and Resulting Outputs During Activity Sequencing



Possible Sequencing Constraints

- Technical requirements and specifications
- Safety and efficiency
- Preferences and policies
- Resource availability

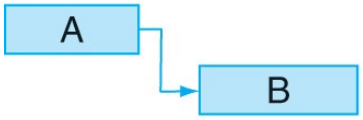
Network Diagram



Network Diagramming Methods

- Precedence diagramming method (PDM)
- Boxes and arrows
  - Boxes represent project activity (called nodes)
  - Arrows represent relationships among activities
- Arrow diagramming method (ADM) or Activity on Arrow (AOA)
  - Arrows represent project tasks or activities
  - Boxes represent milestones

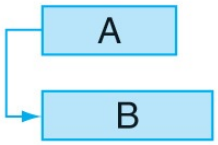
Task Relationships



Finish to start (FS)

A FS *B = B doesn't start before A is finished*

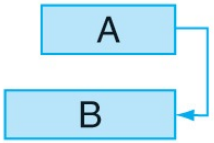
(programming language chosen) FS (programming started)



Start to start (SS).

A SS *B = B doesn't start before A starts*

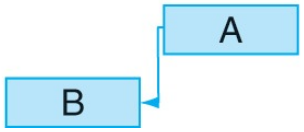
(program design) SS (programming started)



Finish to finish (FF)

A FF *B = B doesn't finish before A is finished*

(programming completed) FF (testing of program)

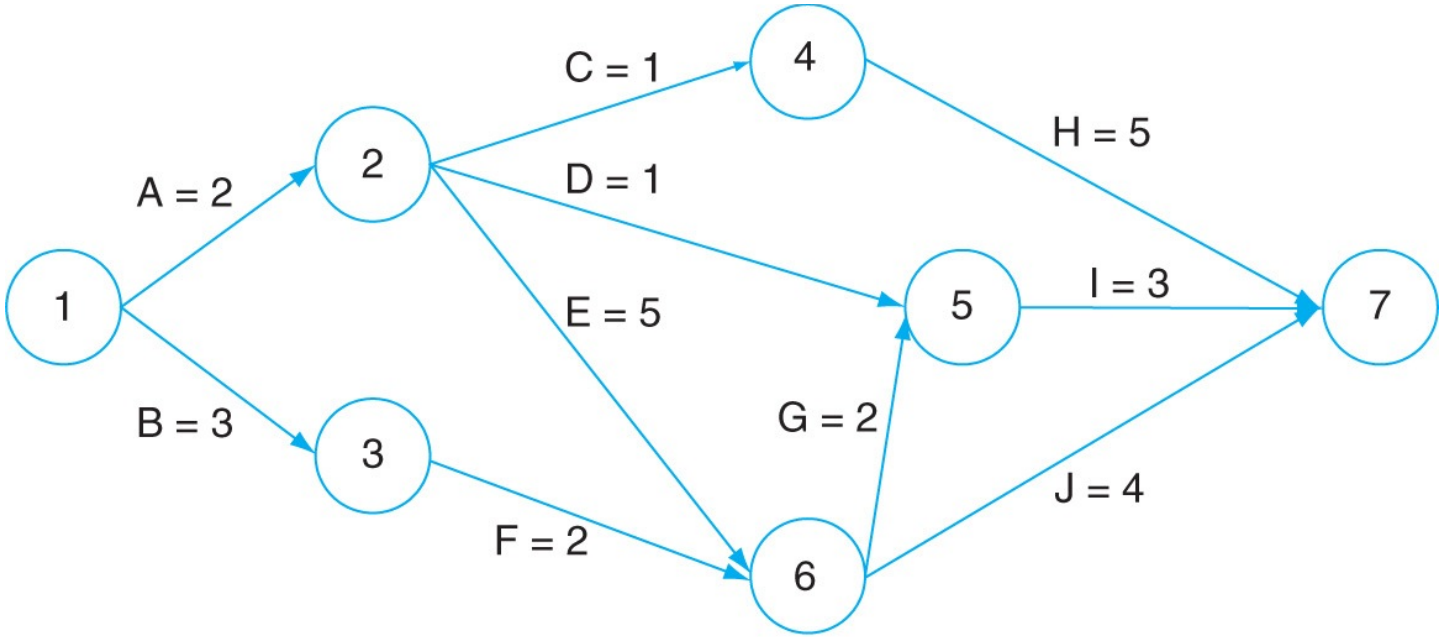


Start to finish (SF)

A SF *B = B doesn't finish before A starts*

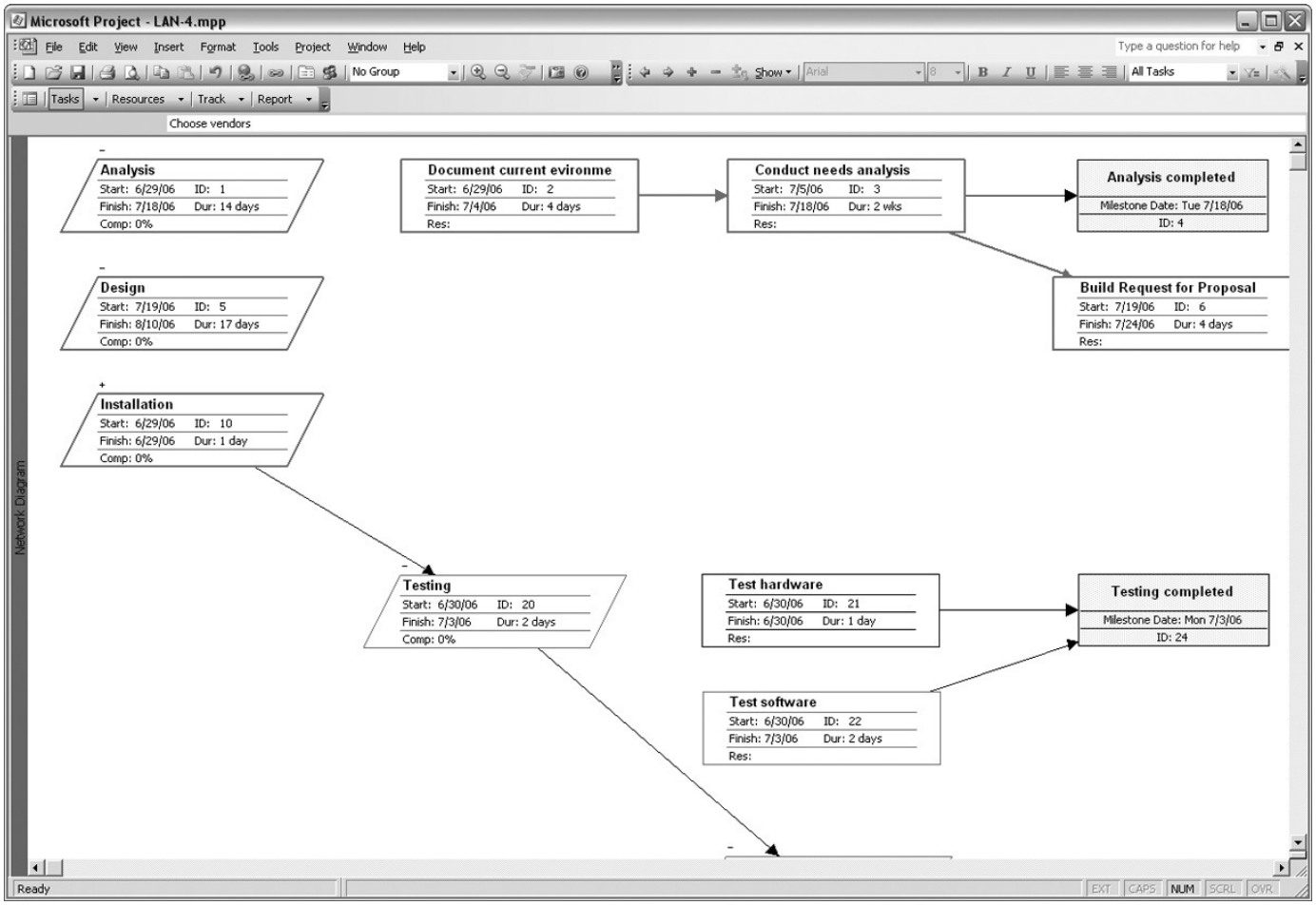
(programming started) SF (saving a copy of the program)

Arrow Diagramming Method (ADM)



Activities' duration are in days; A = 2 indicates that activity A has a duration of 2 days

Network Diagram in Microsoft Project



Additional Activity Type & Time Relationships

- Mandatory dependencies
  - Related activities that cannot be performed in parallel
- Discretionary dependencies
  - Relationships of activities based on preference of the project manager
- External dependencies
  - Relationship of project activities and external events

Additional Activity Type & Time Relationships (cont.)

- Lead Time
  - Time required by one task before another task can begin
- Lag Time
  - Amount of time delay between the completion of one task and the start of the successor

Questions?