Schedule Management

CS413 - Software Engineering Project Management

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Key Terms

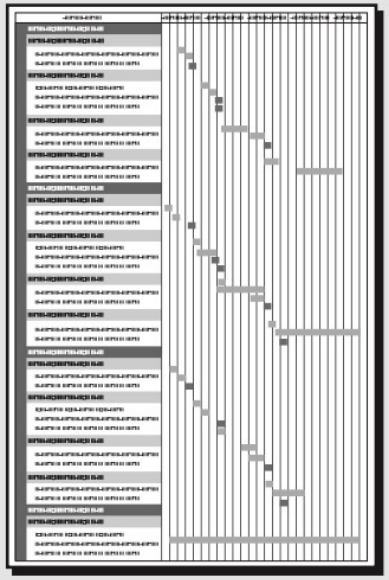
- **Project Schedule**. An output of a schedule model that presents linked activities with planned dates, durations, milestones, and resources
- **Project Schedule Management**. Project Schedule Management includes the processes required to manage the timely completion of the project

Key Terms

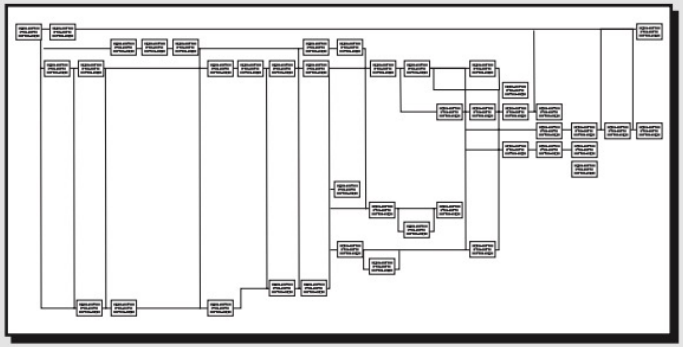
- **Project Schedule Network Diagram**. A graphical representation of the logical relationships among the project schedule activities

Examples of Project Schedule Presentations

Activity List



Bar Chart



Network Diagram

Key Terms

- **Schedule Baseline**. The approved version of a schedule model that can be changed using formal change control procedures and is used as the basis for comparison to actual results.
- **Schedule Compression**. A technique used to shorten the schedule duration without reducing the project scope.

Key Terms

- **Schedule Data**. The collection of information for describing and controlling the schedule
- **Schedule Forecasts**. Estimates or predictions of conditions and events in the project's future based on information and knowledge available at the time the schedule is calculated

Key Terms

- **Schedule Management Plan**. A component of the project or program management plan that establishes the criteria and the activities for developing, monitoring, and controlling the schedule

Key Terms

- **Schedule Model.** A representation of the plan for executing the project's activities including durations, dependencies, and other planning information, used to produce a project schedule along with other scheduling artifacts

Key Terms

- **Schedule Network Analysis**. A technique to identify early and late start dates, as well as early and late finish dates, for the uncompleted portions of project activities

Key Terms

- **Schedule Performance Index (SPI)**. A measure of schedule efficiency expressed as the ratio of earned value to planned value

Key Terms

- Schedule Variance (SV). A measure of schedule performance expressed as the difference between the earned value and the planned value

Key Terms

- **Scheduling Tool**. A tool that provides schedule component names, definitions, structural relationships, and formats that support the application of a scheduling method

Key Concepts

- Project scheduling provides a detailed plan that represents how and when the project will deliver the products, services, and results defined in the project scope

Key Concepts

- The project schedule is used as a tool for communication, managing stakeholder expectations, and a basis for performance reporting

Key Concepts

- When possible, the detailed project schedule should remain flexible throughout the project to adjust for knowledge gained, increased understanding of the risk, and value-added activities

Project Schedule Management

- Includes the processes required to manage the **timely completion** of the project

Schedule Management Processes

- **1 Plan Schedule Management**
- The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule

Schedule Management Processes

- **2 Define Activities**
- The process of identifying and documenting the specific actions to be performed to produce the project deliverables

Schedule Management Processes

- **3 Sequence Activities**
- The process of identifying and documenting relationships among the project activities

Schedule Management Processes

- **4 Estimate Activity Durations**
- The process of estimating the number of work periods needed to complete individual activities with the estimated resources

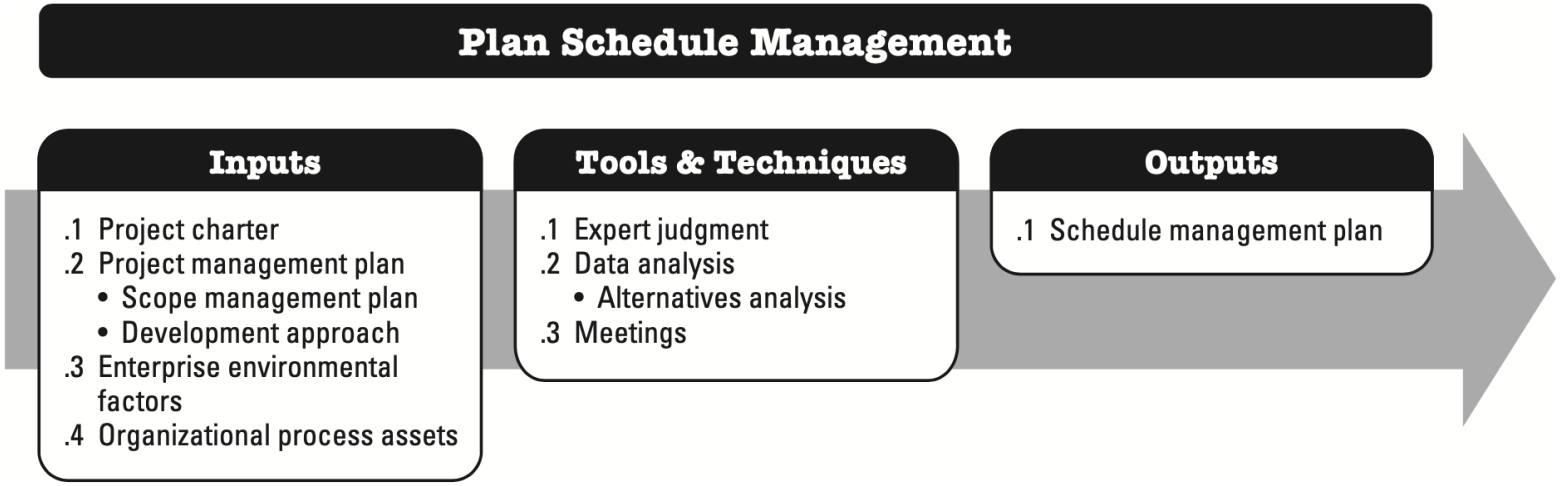
Schedule Management Processes

- **5 Develop Schedule**
- The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling

Schedule Management Processes

- **6 Control Schedule**
- The process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline

Schedule Management



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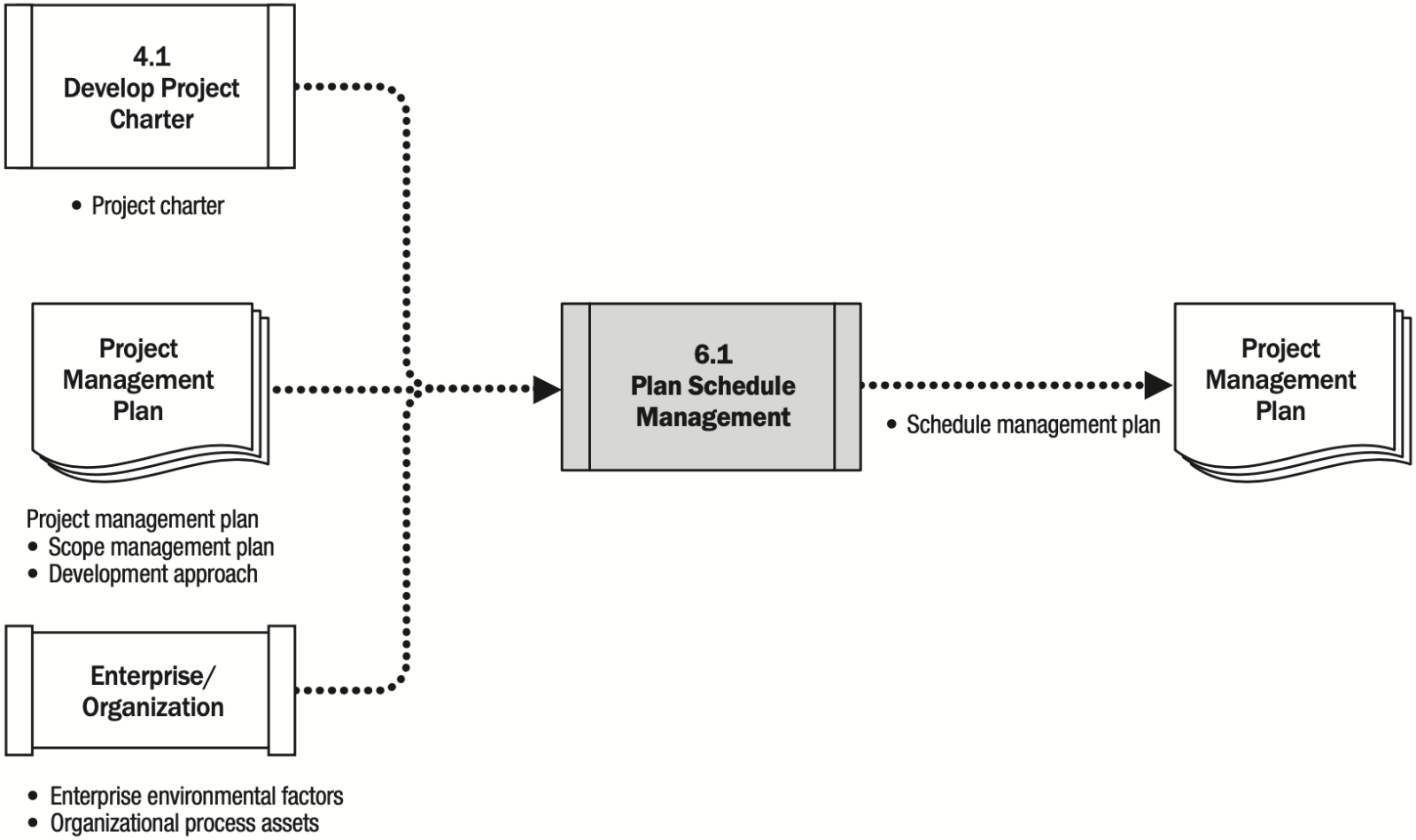

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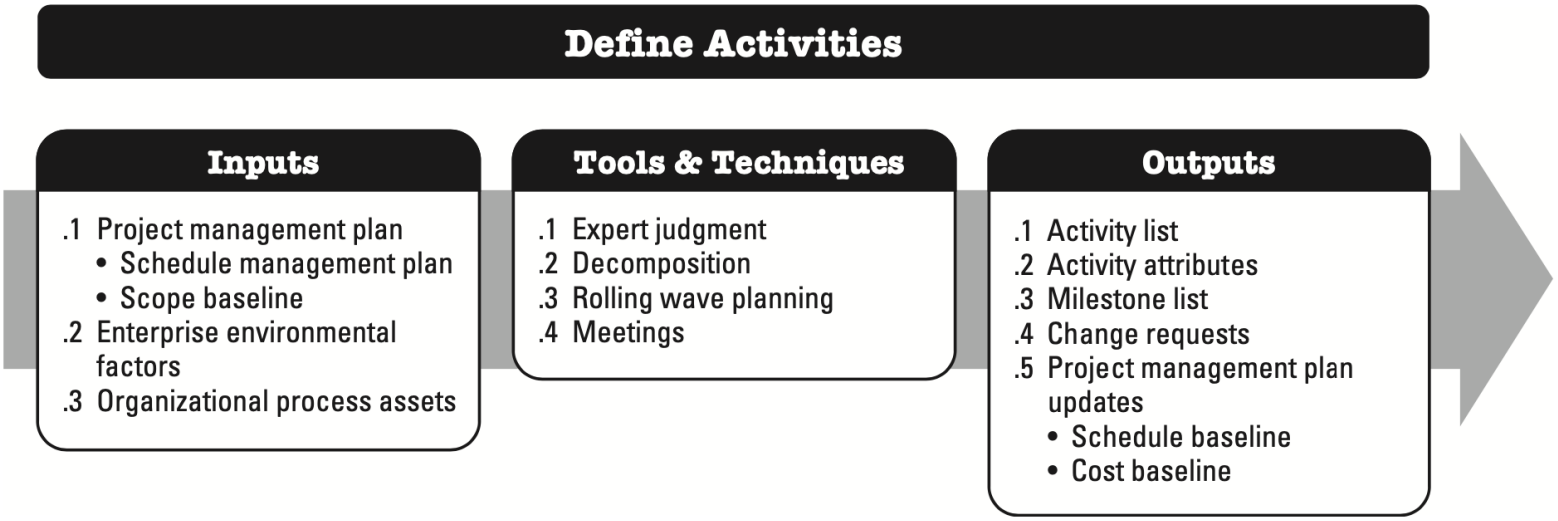

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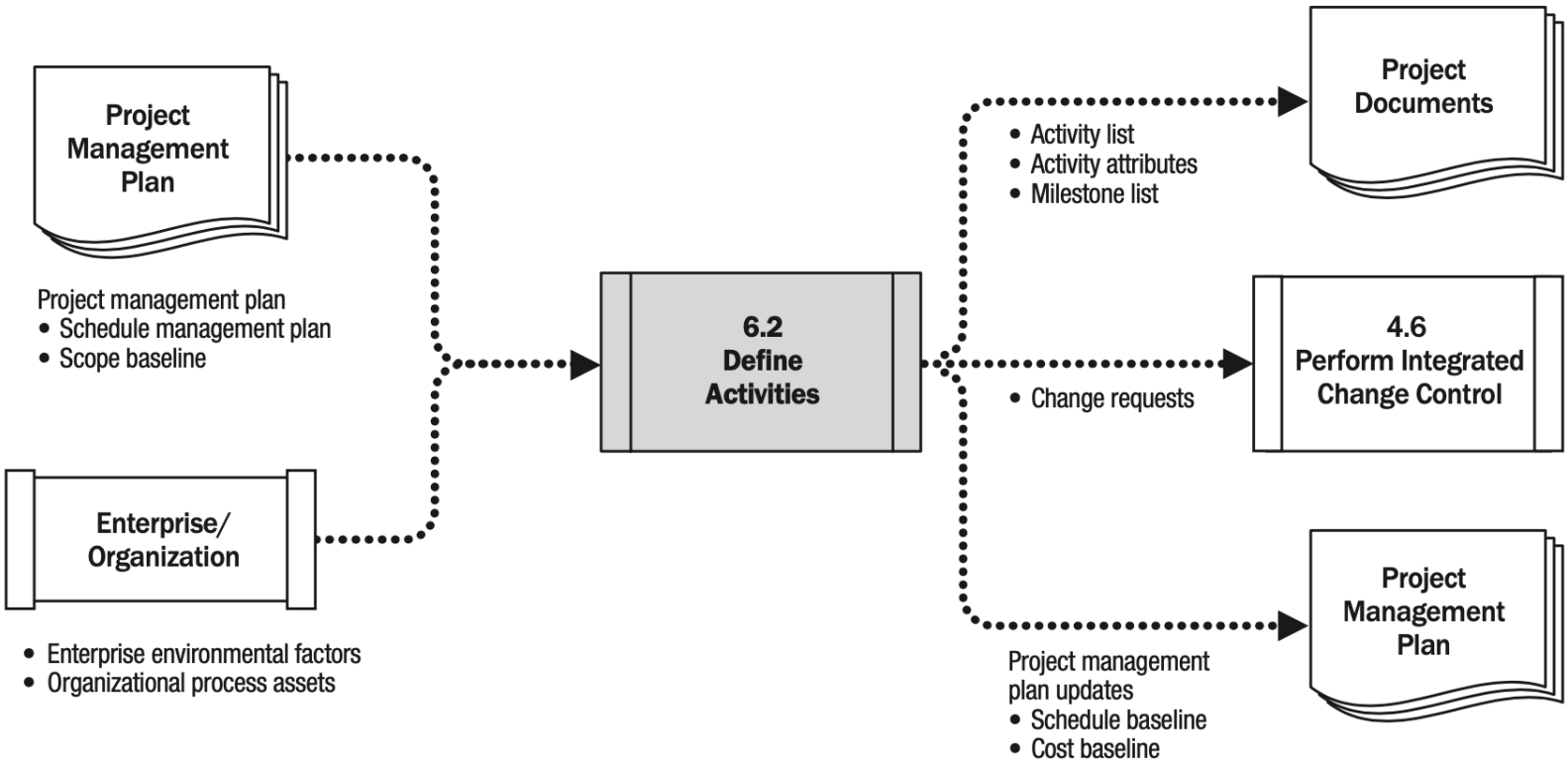
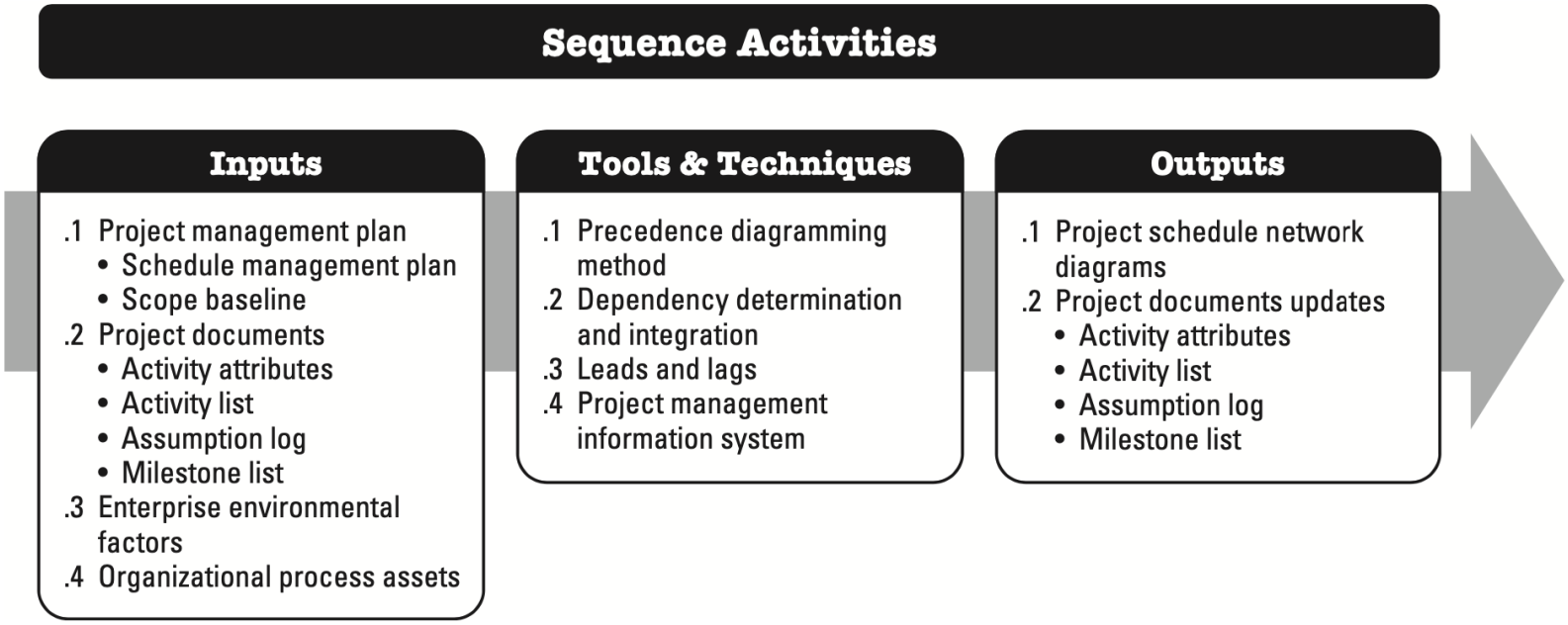
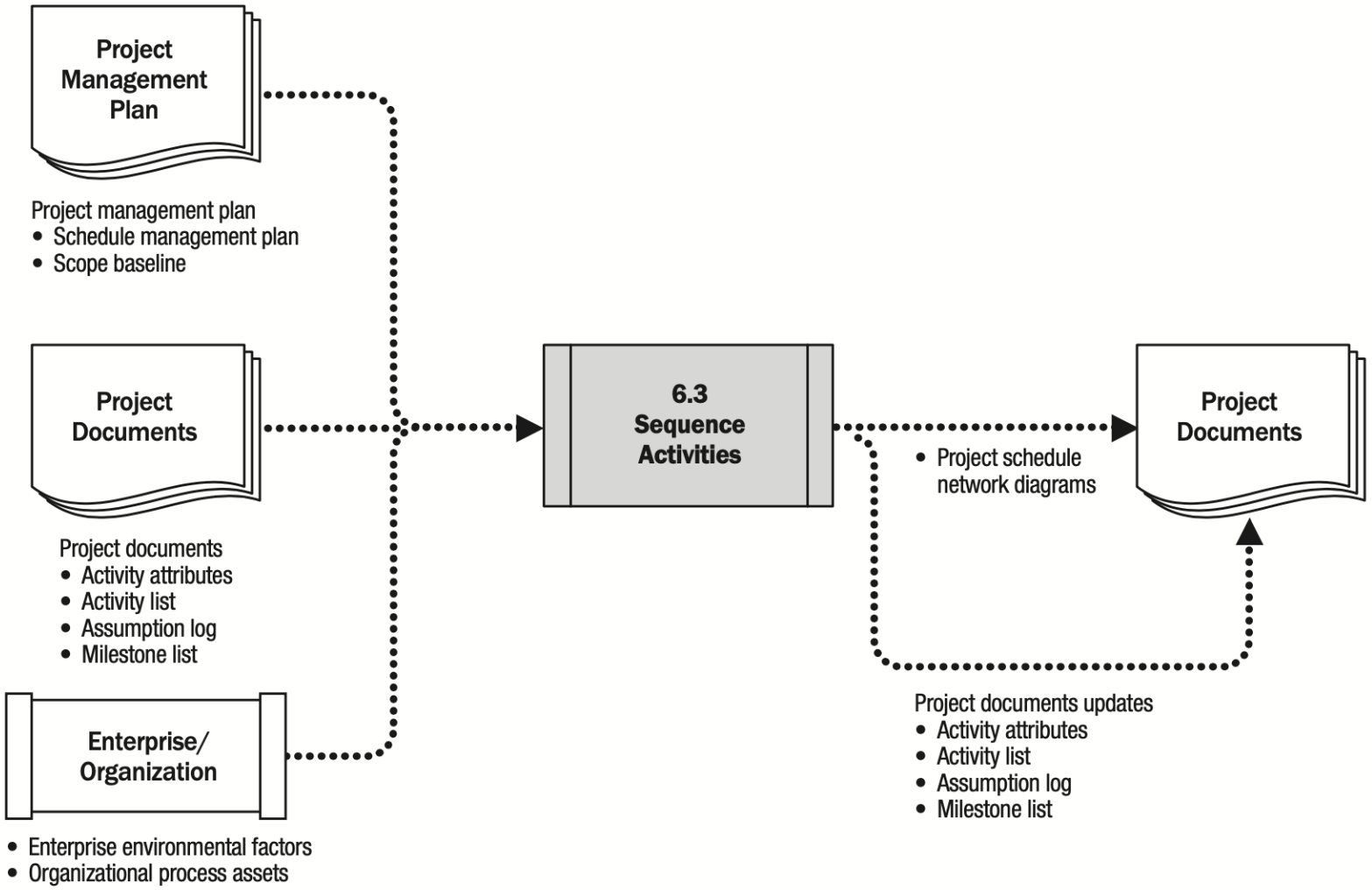
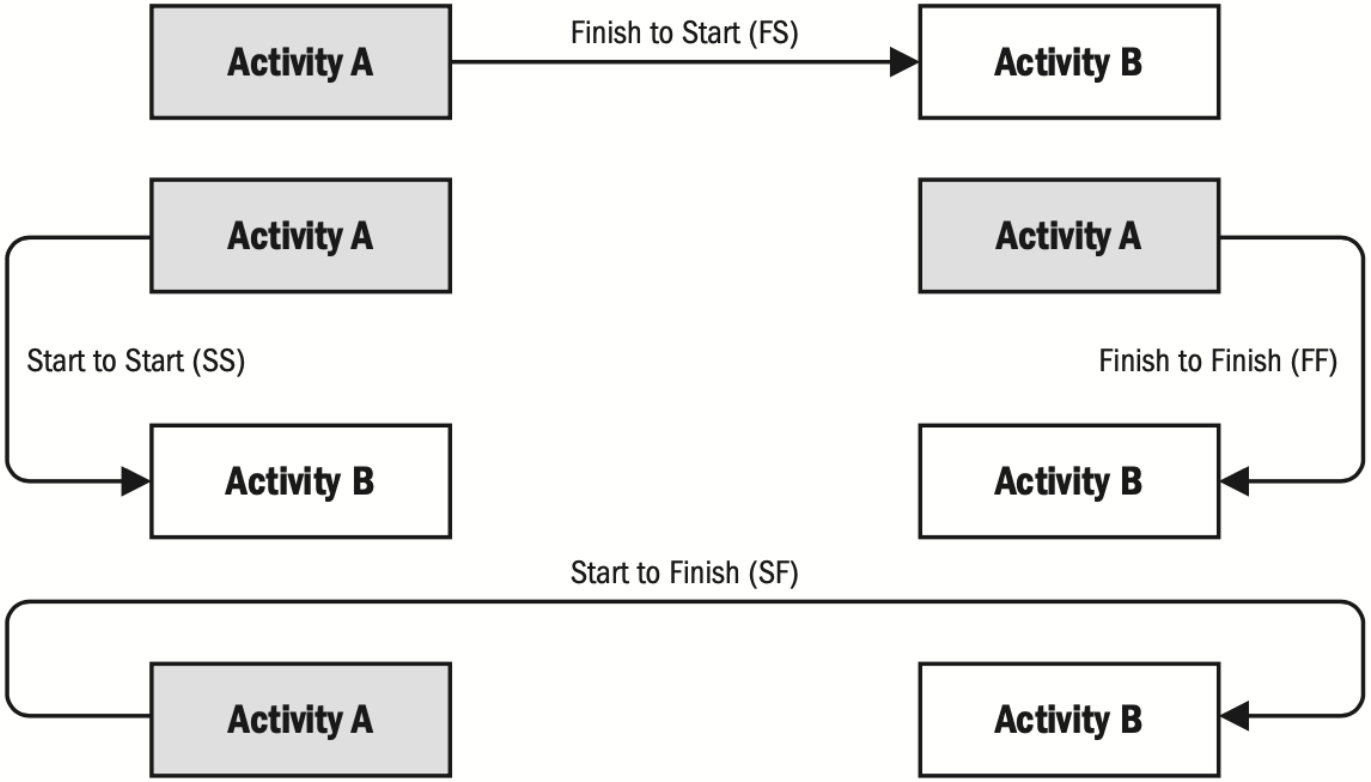


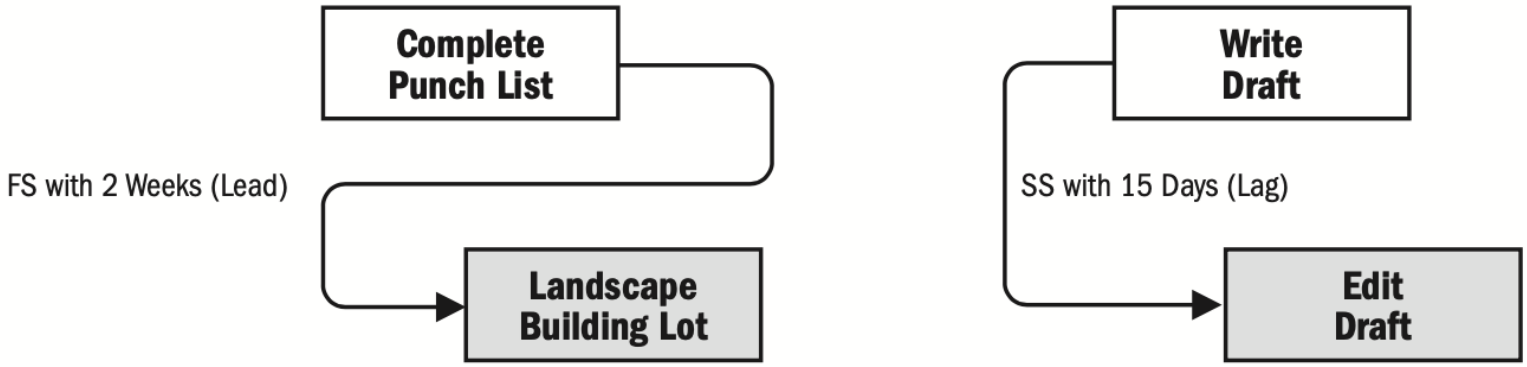

Sequence Activities
Inputs
.1 Project management plan
• Schedule management plan
• Scope baseline
.2 Project documents
• Activity attributes
• Activity list
• Assumption log
• Milestone list
.3 Enterprise environmental factors
.4 Organizational process assets
Tools & Techniques
.1 Precedence diagramming method
.2 Dependency determination and integration
.3 Leads and lags
.4 Project management information system
Outputs
.1 Project schedule network diagrams
.2 Project documents updates
• Activity attributes
• Activity list
• Assumption log
• Milestone list

Schedule Management




Activity A
Finish to Start (FS)
Activity B
Activity A
Activity A
Start to Start (SS)
Finish to Finish (FF)
Activity B
Activity B
Start to Finish (SF)
Activity A
Activity B

Schedule Management



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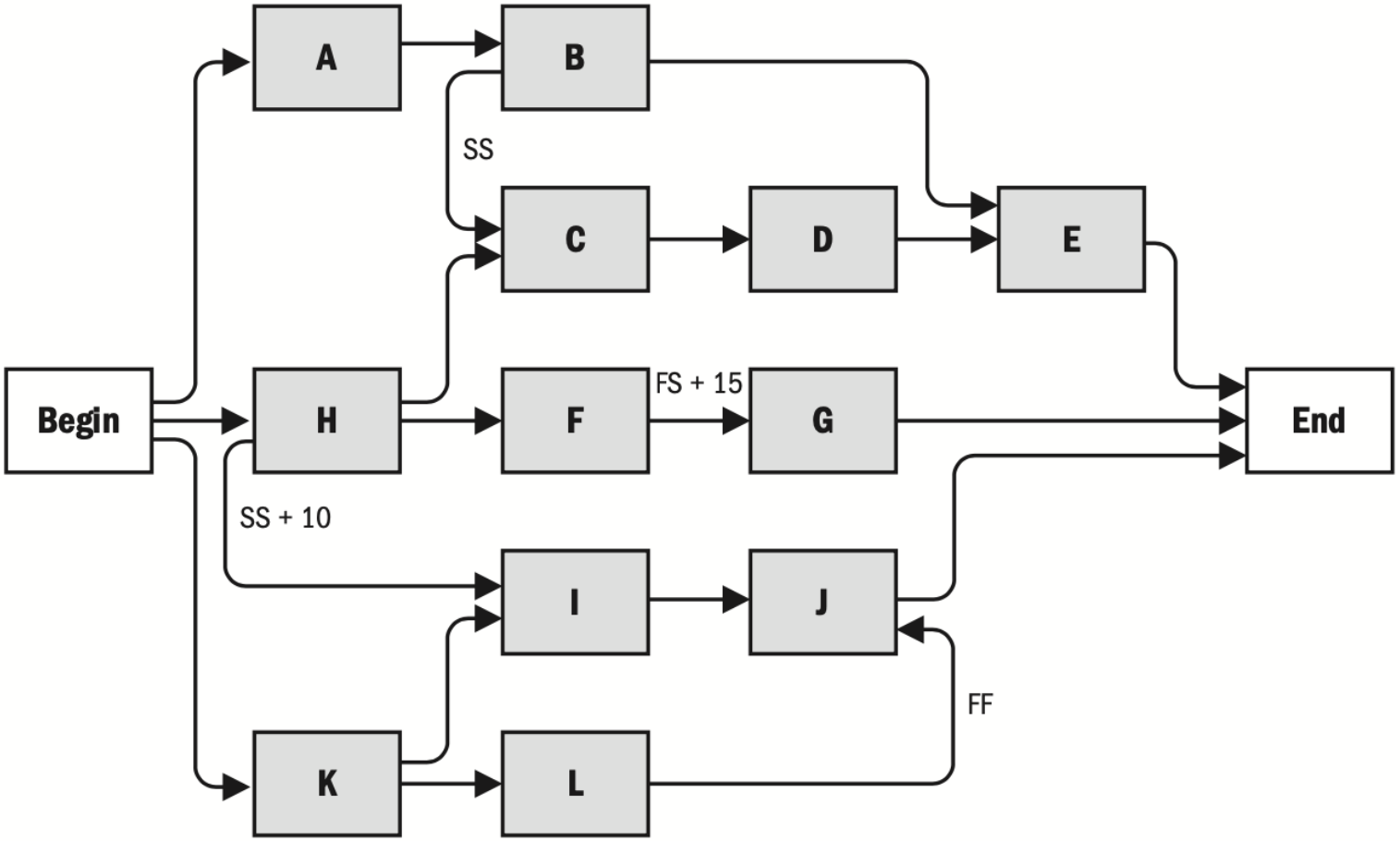


Estimate Activity Durations

Inputs

.1 Project management plan
- Schedule management plan
- Scope baseline

.2 Project documents
- Activity attributes
- Activity list
- Assumption log
- Lessons learned register
- Milestone list
- Project team assignments
- Resource breakdown structure
- Resource calendars
- Resource requirements
- Risk register

.3 Enterprise environmental factors

.4 Organizational process assets

Tools & Techniques

.1 Expert judgment
.2 Analogous estimating
.3 Parametric estimating
.4 Three-point estimating
.5 Bottom-up estimating
.6 Data analysis
- Alternatives analysis
- Reserve analysis

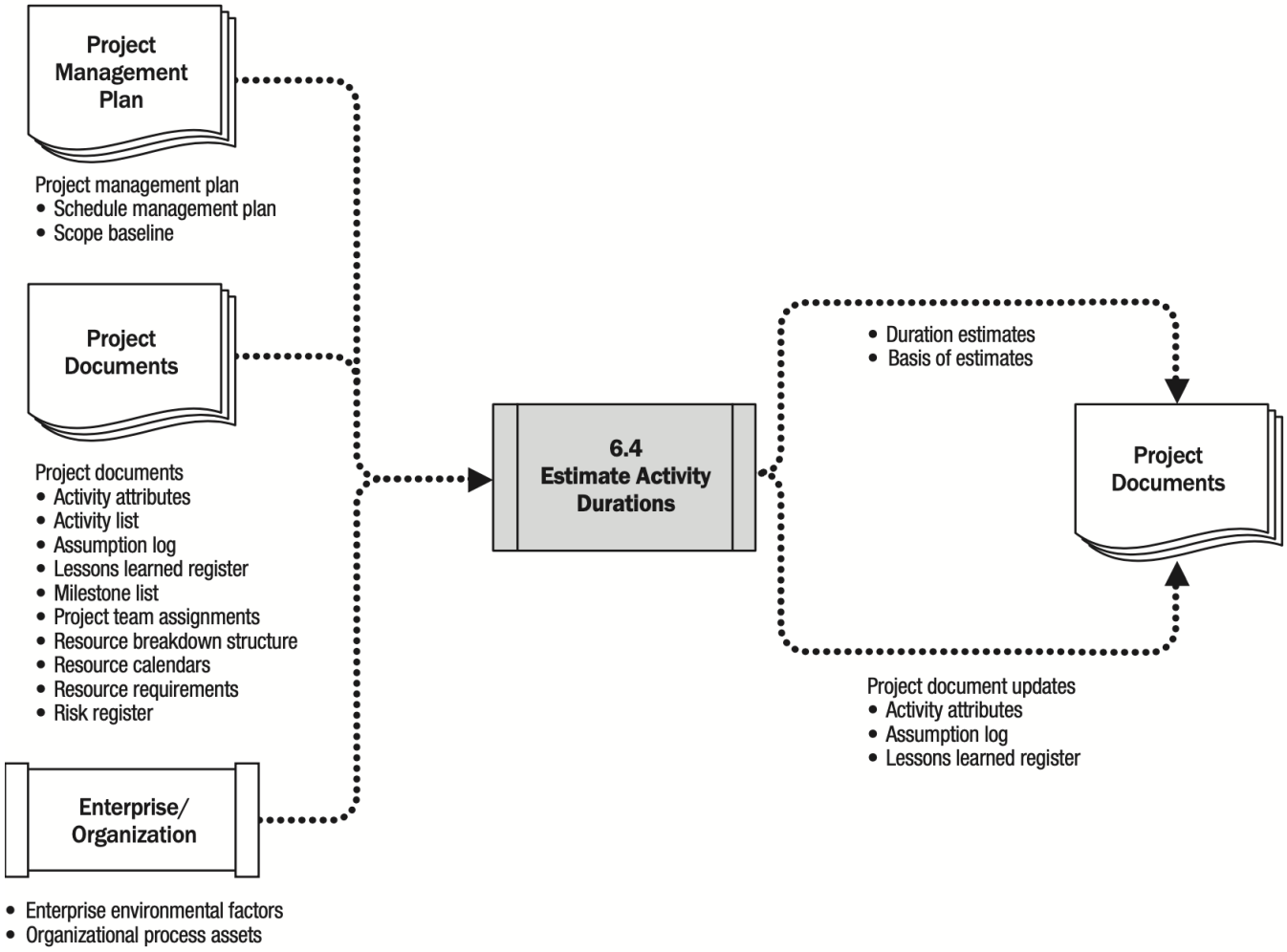
.7 Decision making
- Voting

.8 Meetings

Outputs

.1 Duration estimates
.2 Basis of estimates
.3 Project documents updates
- Activity attributes
- Assumption log
- Lessons learned register

Schedule Management



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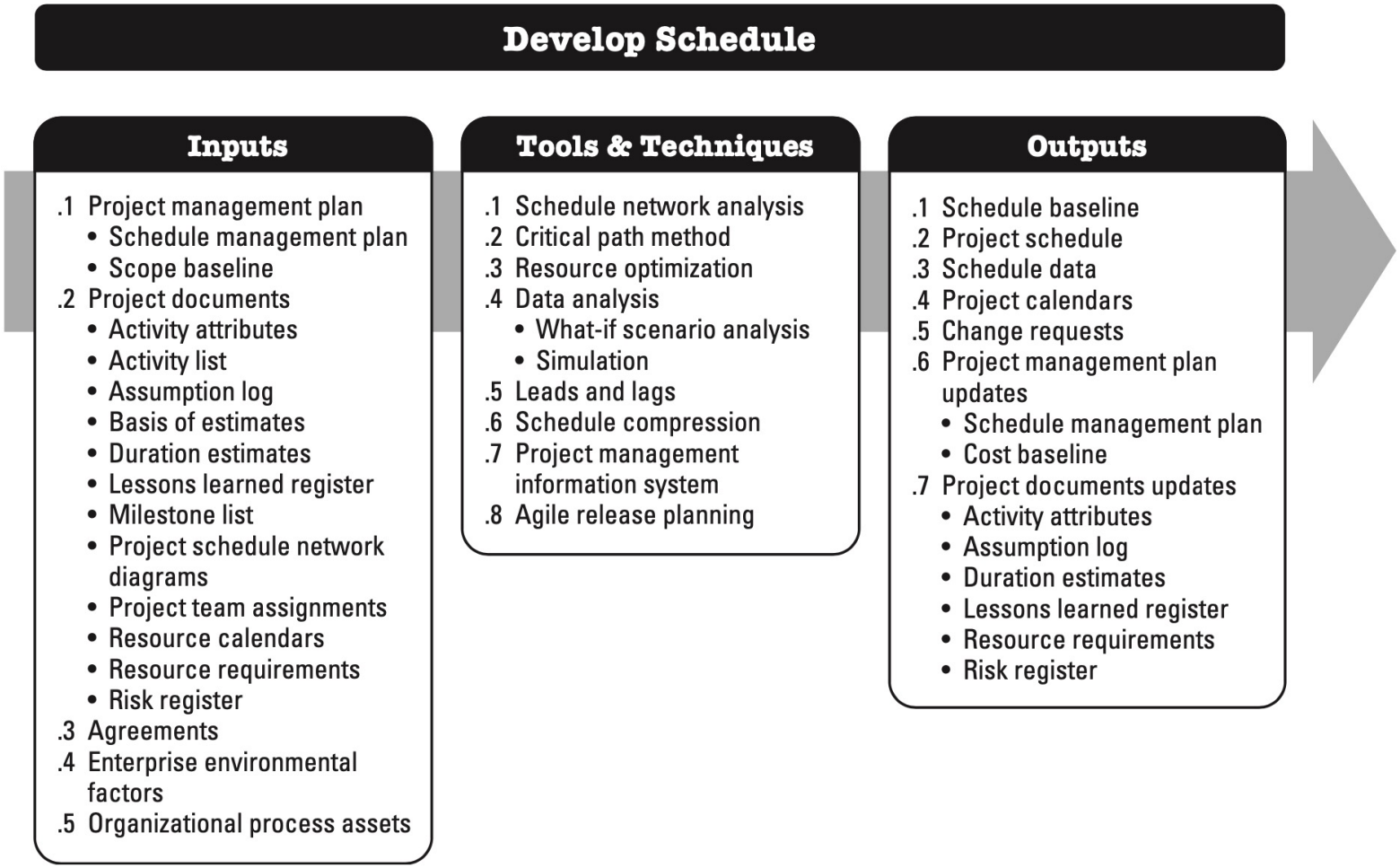

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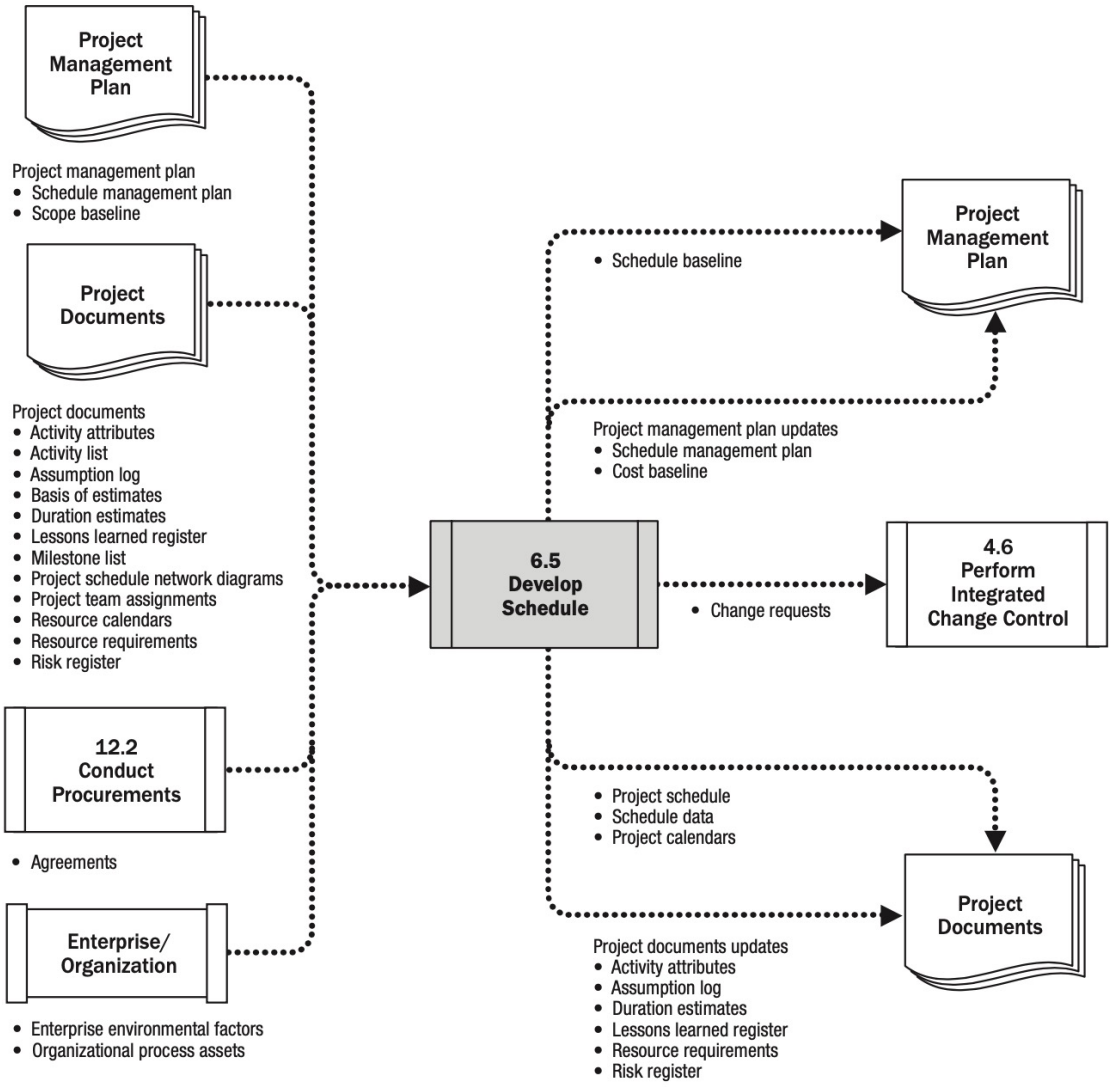
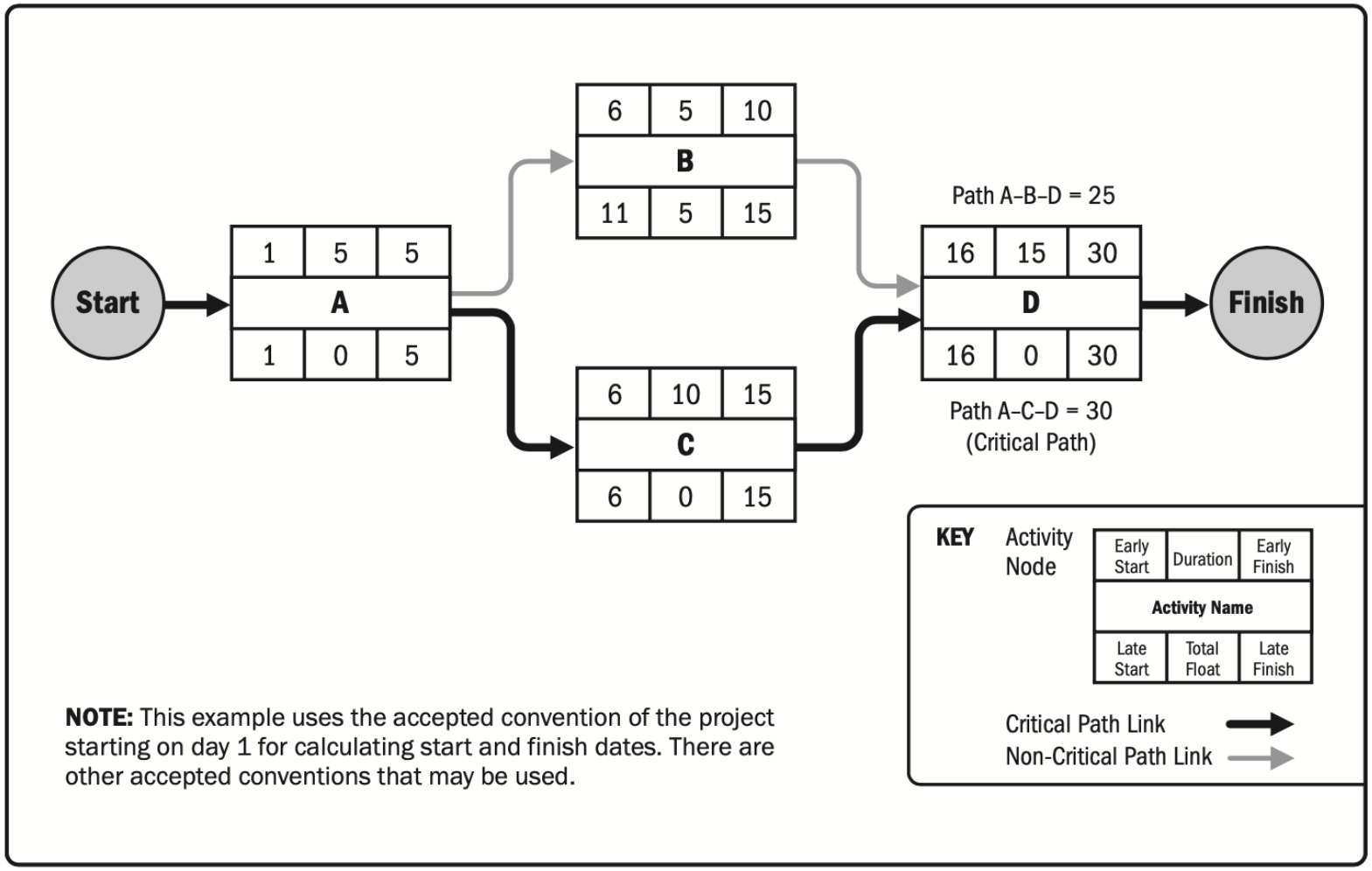
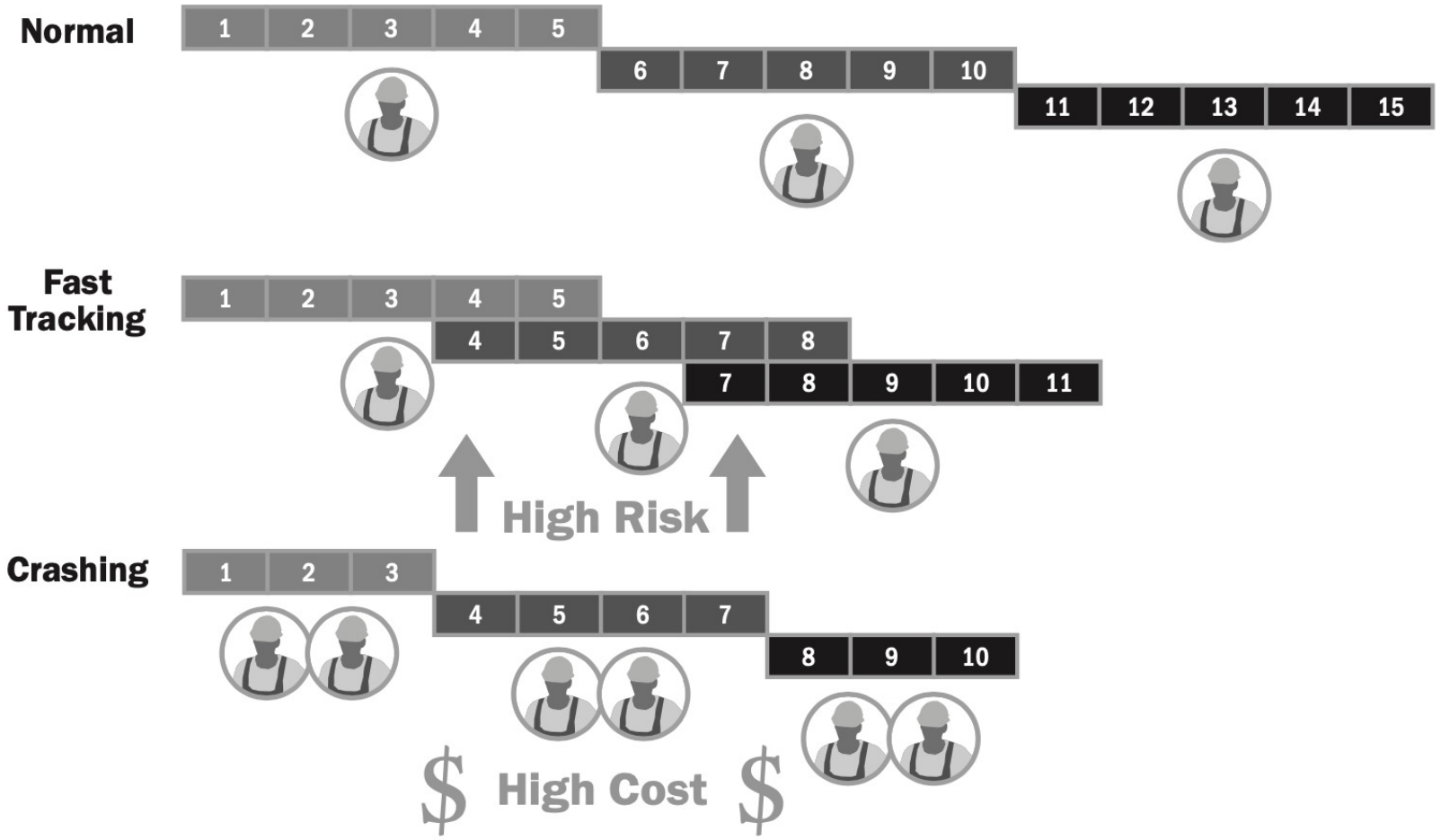
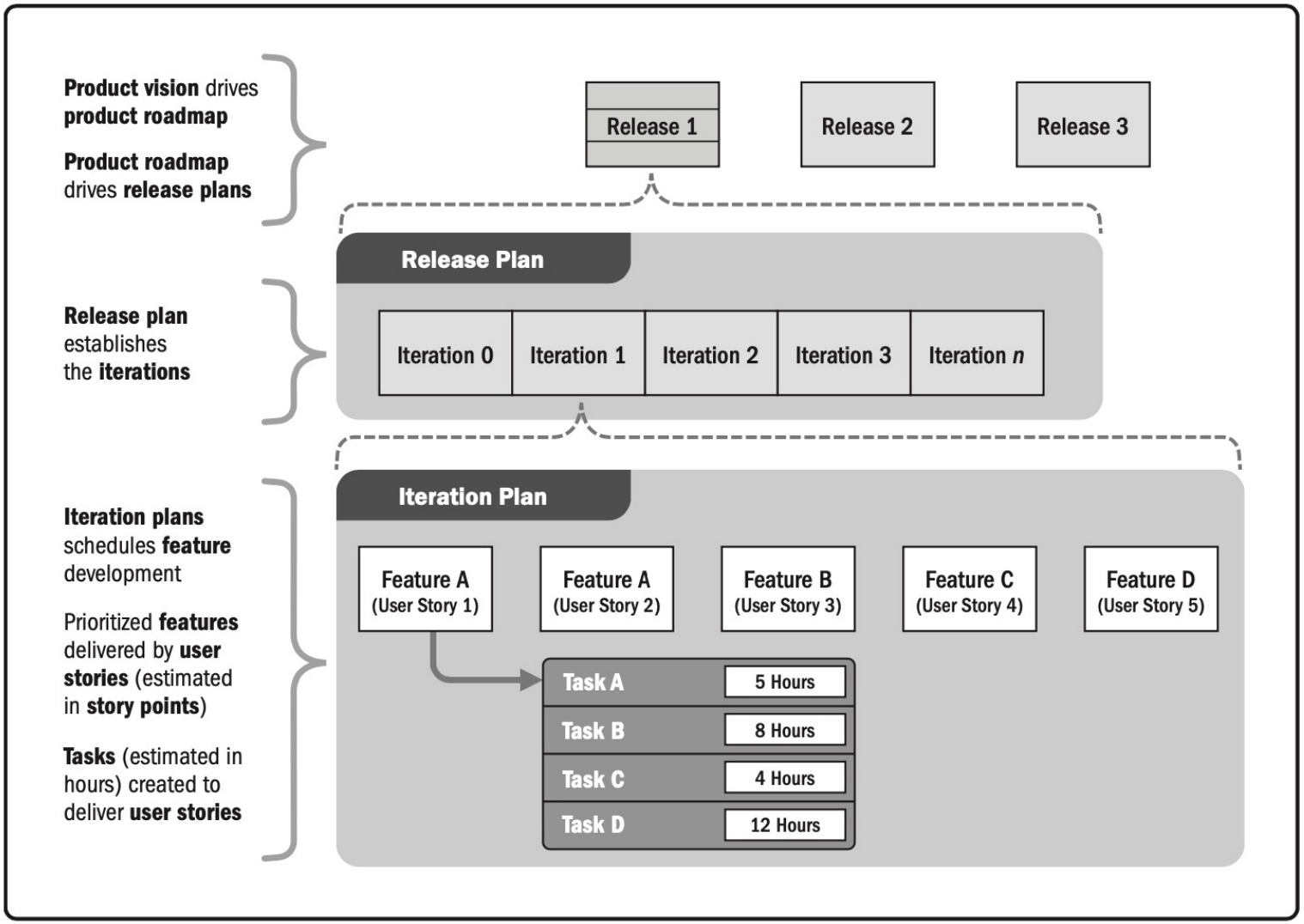



Start
1
5
5
A
1
0
5
6
5
10
B
11
5
15
6
10
15
C
6
0
15
16
15
30
D
16
0
30
Finish
Path A–B–D = 25
Path A–C–D = 30
(Critical Path)
KEY
Activity Node
Early Start
Duration
Early Finish
Activity Name
Late Start
Total Float
Late Finish
Critical Path Link
Non-Critical Path Link
NOTE: This example uses the accepted convention of the project starting on day 1 for calculating start and finish dates. There are other accepted conventions that may be used.


Normal
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Fast Tracking
1
2
3
4
5
4
5
6
7
8
7
8
9
10
11
High Risk
Crashing
1
2
3
4
5
6
7
8
9
10
$
High Cost
$

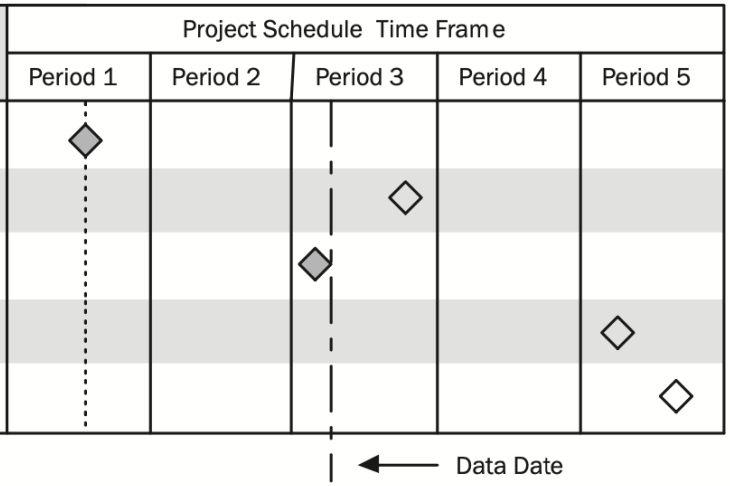
Schedule Management



Schedule Management

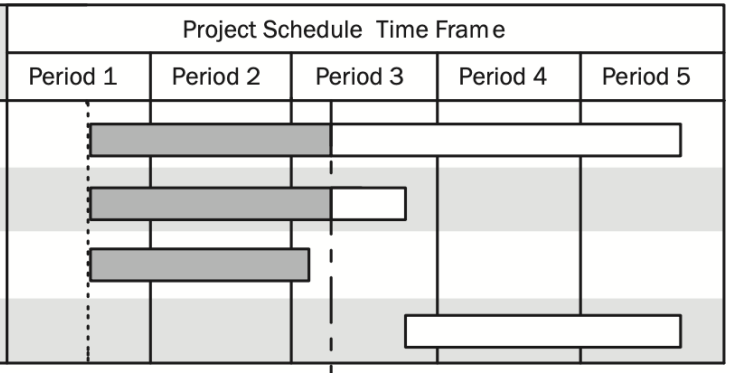
Milestone Schedule

Activity Identifier	Activity Description	Calendar units
1.1.MB	Begin New Product Z	0
1.1.1.M1	Complete Component 1	0
1.1.2.M1	Complete Component 2	0
1.1.3.M1	Complete Integration of Components 1 & 2	0
1.1.3.MF	Finish New Product Z	0



Summary Schedule

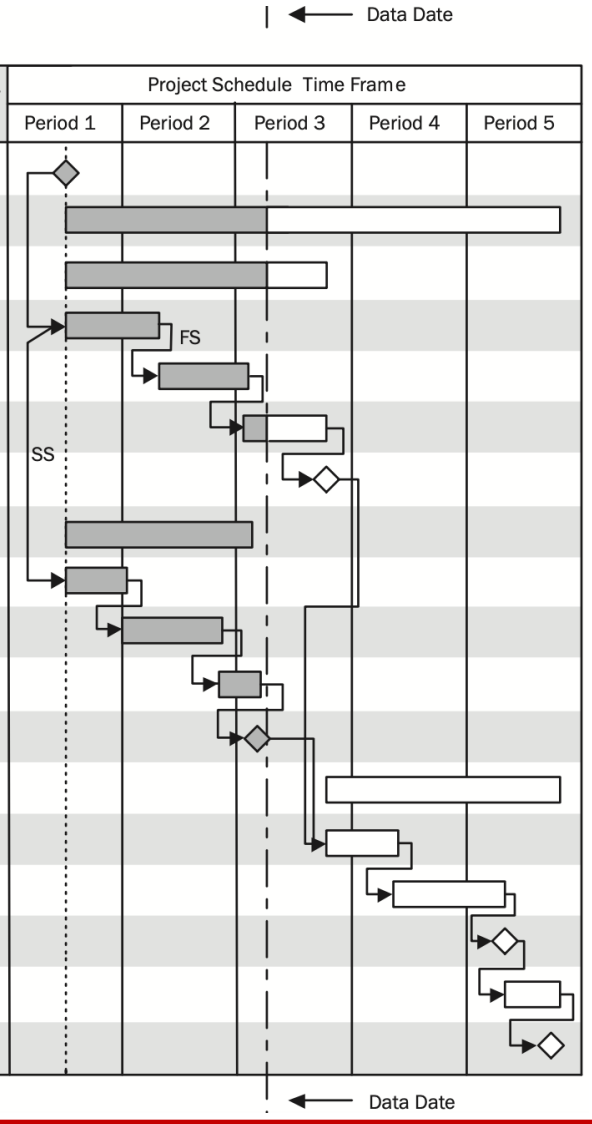
Activity Identifier	Activity Description	Calendar units
1.1	Develop and Deliver New Product Z	120
1.1.1	Work Package 1: Component 1	67
1.1.2	Work Package 2: Component 2	53
1.1.3	Work Package 3: Integrated Components 1 and 2	53



Schedule Management

Detailed Schedule

Activity Identifier	Activity Description	Calendar units
1.1.MB	Begin New Product Z	0
1.1	Develop and Deliver Product Z	120
1.1.1	Work Package 1: Component 1	67
1.1.1.D	Design Component 1	20
1.1.1.B	Build Component 1	33
1.1.1.T	Test Component 1	14
1.1.1.M1	Complete Component 1	0
1.1.2	Work Package 2: Component 2	53
1.1.2.D	Design Component 2	14
1.1.2.B	Build Component 2	28
1.1.2.T	Test Component 2	11
1.1.2.M1	Complete Component 2	0
1.1.3	Work Package 3: Integrated Components 1 and 2	53
1.1.3.G	Integrate Components 1 and 2 as Product Z	14
1.1.3.T	Complete Integration of Components 1 and 2	32
1.1.3.M1	Test Integrated Components as Product Z	0
1.1.3.P	Deliver Product Z	7
1.1.3.MF	Finish New Product Z	0



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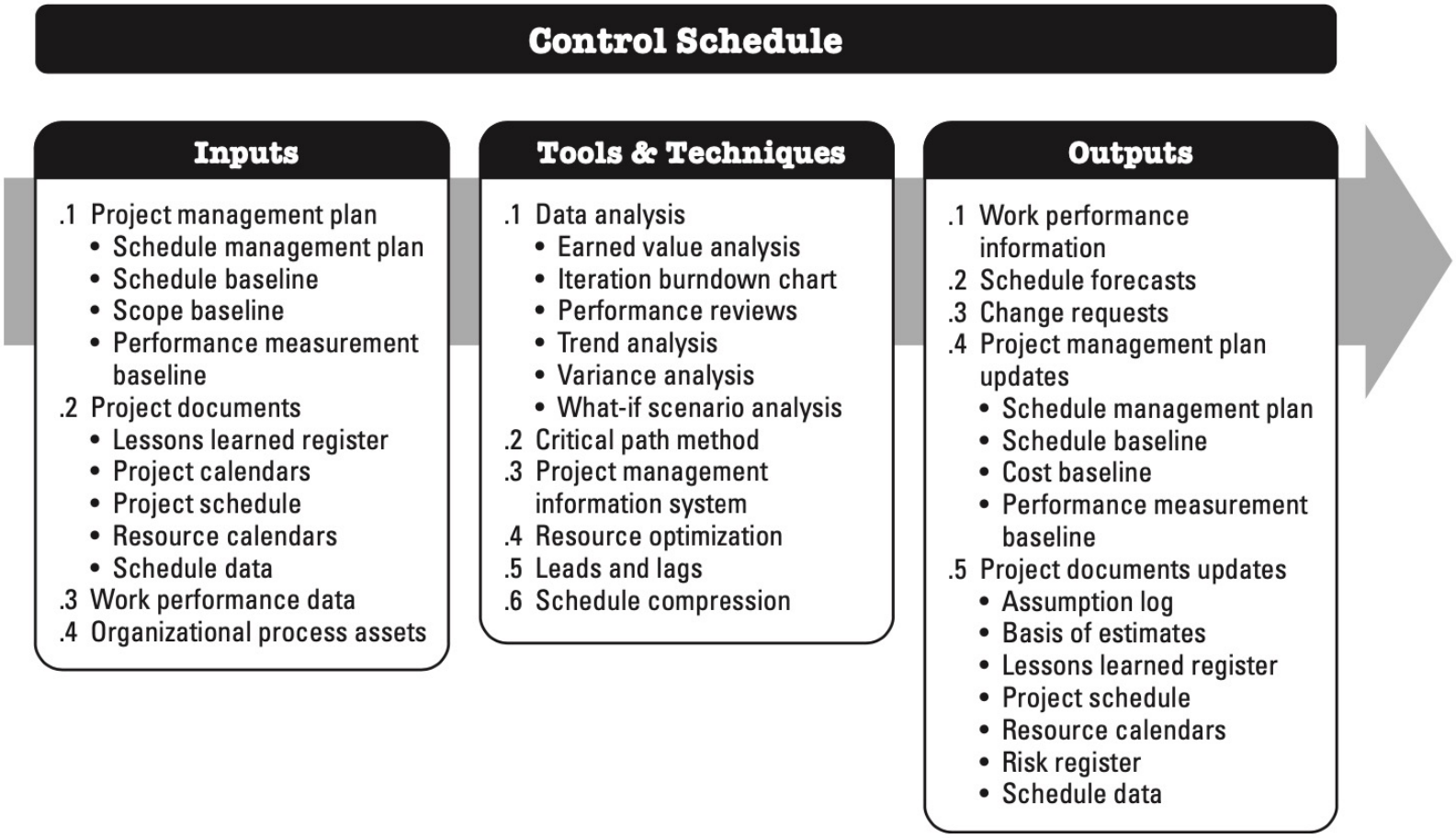

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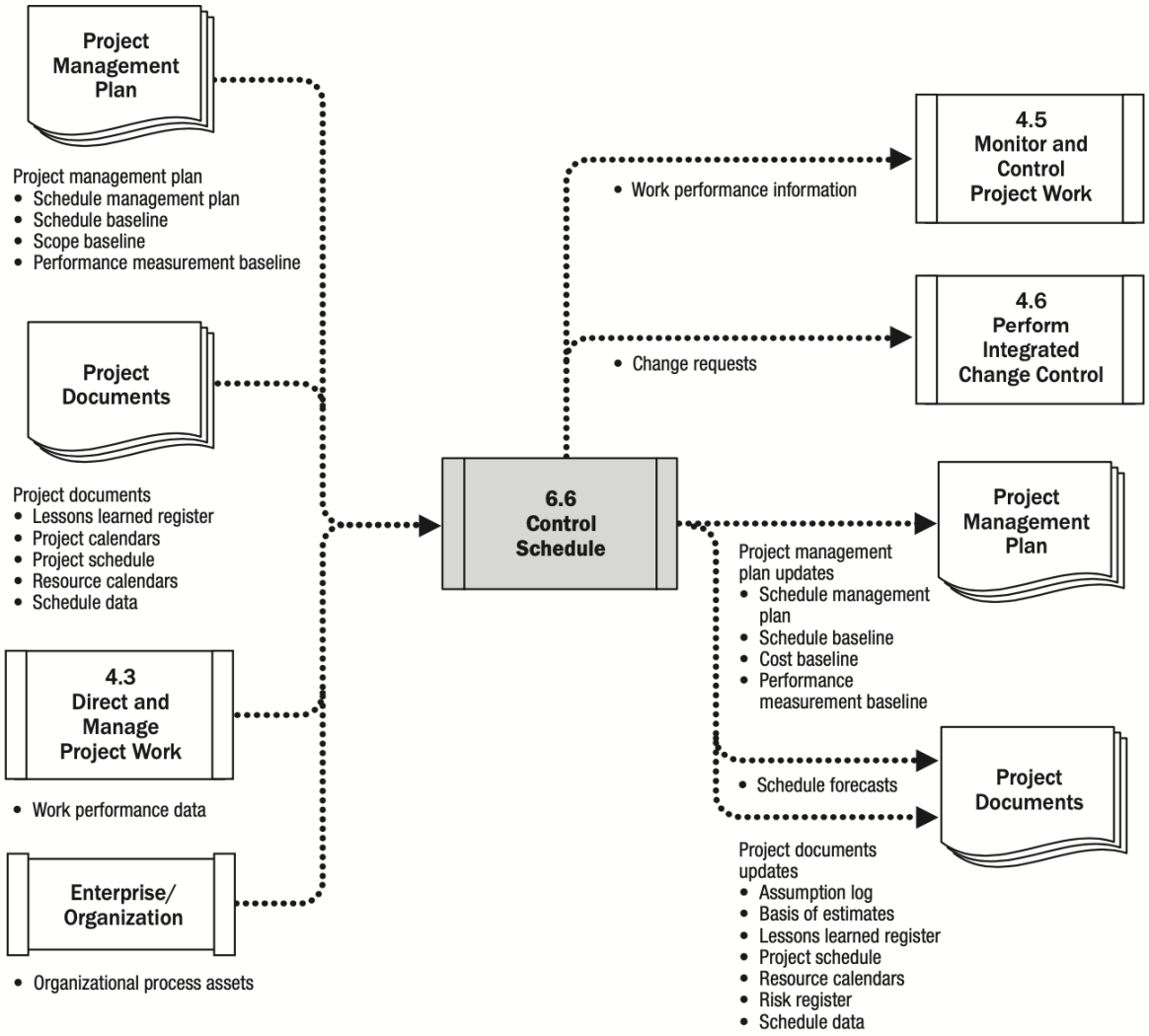

Schedule Management

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	

Tailoring Considerations

- **Life cycle approach**
- What is the most appropriate life cycle approach that allows for a detailed schedule?

Tailoring Considerations

- **Duration and resource**
- What are the factors influencing durations, such as the correlation between resource availability and productivity?

Tailoring Considerations

- **Project dimensions**
- How will the presence of project complexity, technological uncertainty, product novelty, pace or progress tracking, (such as earned value management, percentage complete, red-yellow-green (stop light) indicators) impact the desired level of control?

Tailoring Considerations

- **Technology support**
- Is technology used to develop, record, transmit, receive, and store project schedule model information and is it readily accessible?

References

- A guide to the project management body of knowledge (PMBOK guide), Sixth Edition, 2017 / Project Management Institute.

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