

# **PROJECT SCHEDULING**

# Outline

- 1. Review Lecture 6**
- 2. What is Scheduling**
- 3. Planning vs. Scheduling**
- 4. Scheduling methods**
- 5. Project Scheduling**

# What is Scheduling?

There are multiple ways of defining scheduling. Scheduling is:

- ...**Forming a network of activities and event relationships** that **portrays the sequential relations** between the tasks in a project...
- ...**Planned completion of a project** based on the logical arrangement of activities, resources...
- ...**Placing the project and its activities** in a workable sequenced **timetable**...
- ...**A detailed outline of activities/tasks** with respect to time...

While scheduling is all of these things, the main thing to remember is that

**scheduling is the development of planned dates for performing project activities and meeting milestones.**

# Planning vs. Scheduling

**Planning involves making decisions with the objective of influencing the future.**

In planning you answer the following questions:

**What** will be performed?

- This question is answered **by determining the final project product** necessary for achieving project success. This is done in the initiation phase before the development of your WBS.

**How** will it be performed?

- This question is answered **by determining the processes, procedures,** and methodologies used to complete the project.

# Planning vs. Scheduling

**Where** will it be performed?

- **This answer varies for each type of project.** For example, if it's a construction project, the "where" will be the physical location of the building or road etc. If the project is a software development project, the answer could be the physical location of the project team or the final location of the project software.

**Who** will perform the work?

- This question is answered **by determining if the work will be contracted or will use in-house resources.** Then, the question will be examined in even more detail: if a contractor, what type of contractor, and if company resource, what department and who in each department?

In **what** sequence?

- This question **involves determining the order in which activities will be performed to complete the project.**

# Planning vs. Scheduling

With **five main questions answered**, only one last question remains:  
**when.** This question involves scheduling.

Scheduling determines the timing of operations in the project. The schedule will determine the specific start and completion dates for the project and all project activities. Another way to look at scheduling is to consider it the “action” or “doing it” phase. In scheduling you answer the question:

**When will the work be performed?**

- **Scheduling includes the project start and completion dates, project deliverables and milestones dates, and the start and completion dates for all activities needed to successfully complete the project.**

# Scheduling Methods

- Bar charts /Gantt chart
- Velocity charts (s-curve)
- Network diagram/CPM (will discuss)

# Scheduling Methods

- Bar charts /Gantt chart

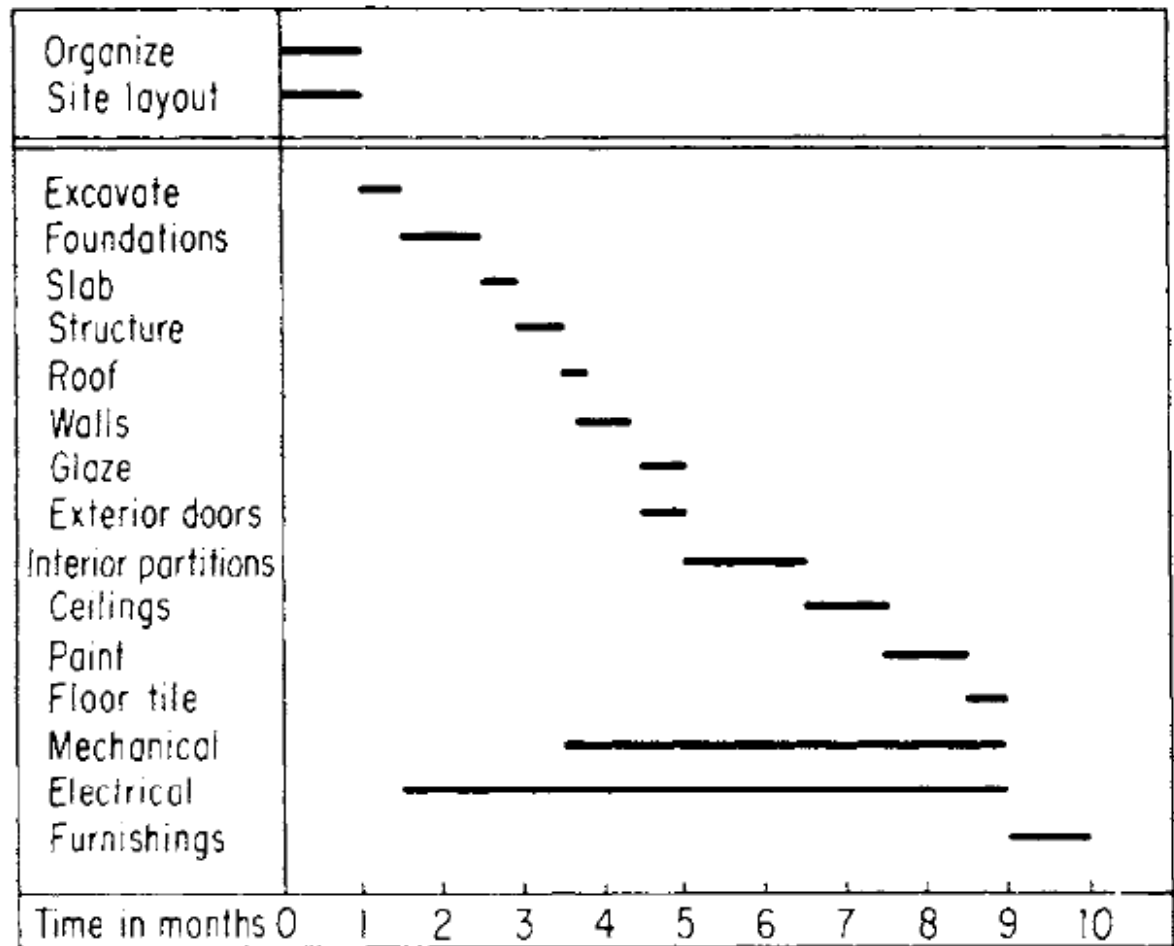


Figure 1.5.1 Bar chart for a one-story building.



# Scheduling Methods

- Velocity charts (s-curve)

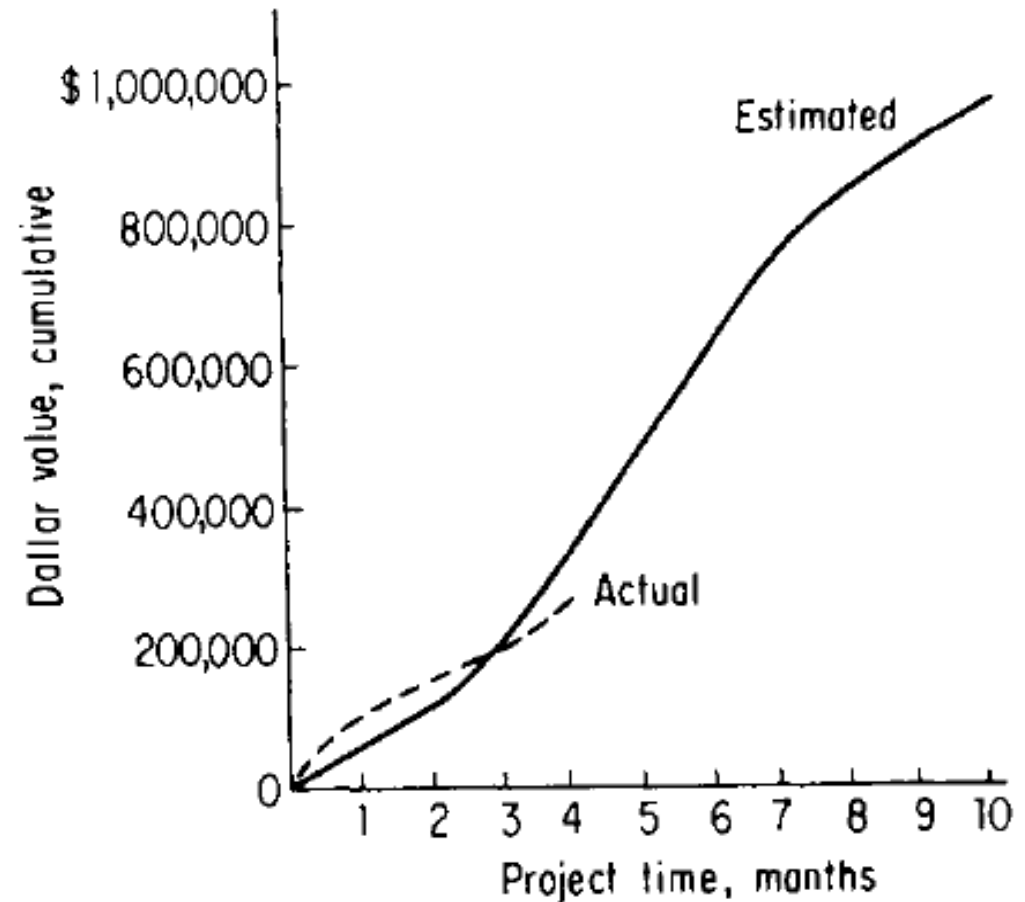


Figure 1.5.3 Typical S curve.

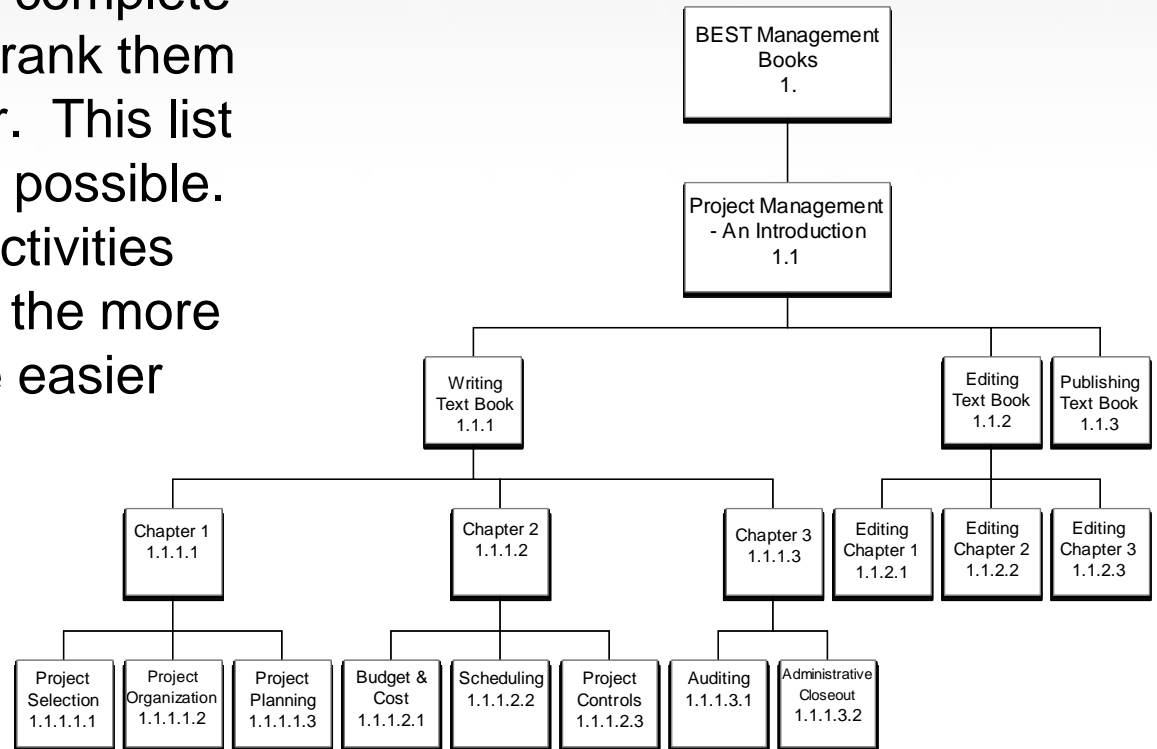
# Project Scheduling

Project scheduling involves a clear, five step process. This process aids managers in determining the project schedule and, eventually, the project schedule baseline. The process steps are:

1. Develop the list of project activities
2. Sequence the list of project activities
3. Determine the relationships between activities
4. Establish the duration for each activities
5. Determine the project duration (start and completion dates)

# Scheduling - Step 1. Develop a List of Project Activities

Developing a list of project activities is as simple as it sounds: list all activities that are needed to complete the project. Do not order or rank them yet, as this step comes later. This list needs to be as complete as possible. You can add and subtract activities throughout the process, but the more complete the list is now, the easier the process will be.



# Scheduling – Step 1. Develop a List of Project Activities

There are two things to remember at this stage of the process.

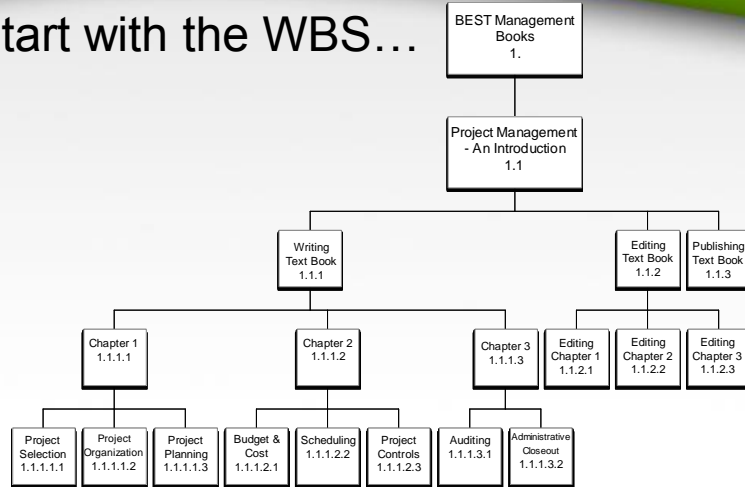
1. The activity list is not a complete list; additions and subtractions will be made from it.

WBS	Activity List
1.1	Start Development of Project Management Book
1.1.1.1.1	Writing Project Selection section for Chapter 1
1.1.1.1.2	Writing Project Organization section for Chapter 1
1.1.1.1.3	Writing Project Planning section for Chapter 1
1.1.1.2.1	Writing Budget and Cost section for Chapter 2
1.1.1.2.2	Writing Scheduling section for Chapter 2
1.1.1.2.3	Writing Project Controls section for Chapter 2
1.1.1.3.1	Writing Auditing section for Chapter 3
1.1.1.3.2	Writing Administrative Closeout section for Chapter 3
1.1.2.1	Editing Chapter 1
1.1.2.2	Editing Chapter 2
1.1.2.3	Editing Chapter 3
1.1.3	Publishing Project Management Book
1.1	Finished Development of the Project Management Book

2. As you develop your list, you may see the need to update the WBS. Remember the WBS is a dynamic tool, revisions may be needed and should be expected as the scheduling of activities progresses.

# Scheduling – Step 2. Sequence the List of Project Activities

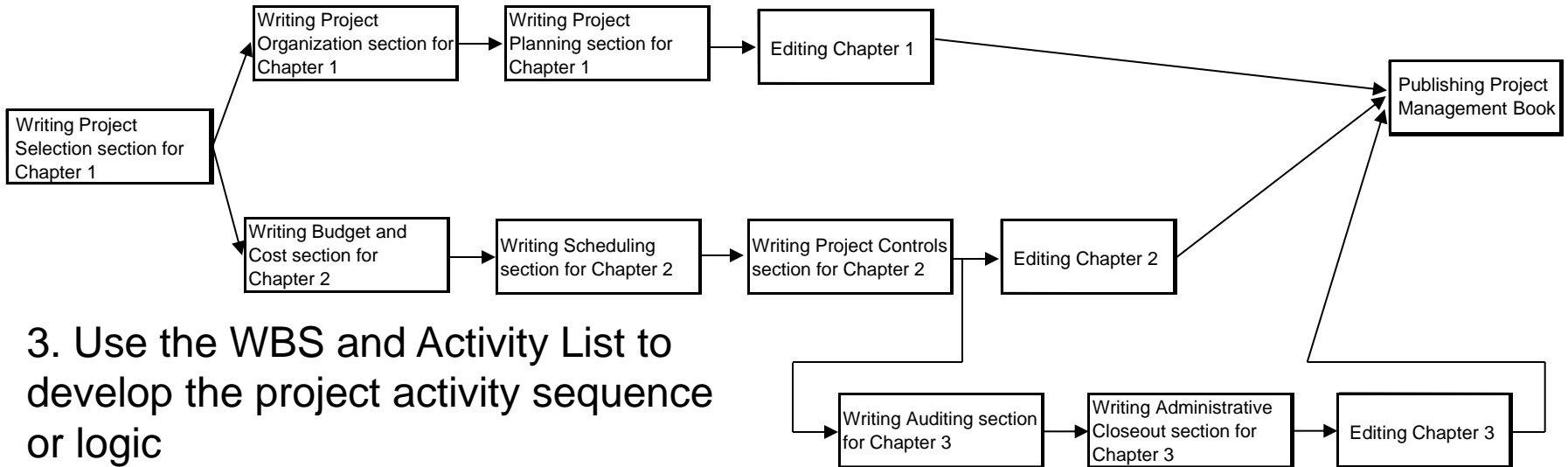
## 1. Start with the WBS...



## 2. Develop the Activity List....

WBS	Activity List
1.1	Start Development of Project Management Book
1.1.1.1.1	Writing Project Selection section for Chapter 1
1.1.1.1.2	Writing Project Organization section for Chapter 1
1.1.1.1.3	Writing Project Planning section for Chapter 1
1.1.1.2.1	Writing Budget and Cost section for Chapter 2
1.1.1.2.2	Writing Scheduling section for Chapter 2
1.1.1.2.3	Writing Project Controls section for Chapter 2
1.1.1.3.1	Writing Auditing section for Chapter 3
1.1.1.3.2	Writing Administrative Closeout section for Chapter 3
1.1.2.1	Editing Chapter 1
1.1.2.2	Editing Chapter 2
1.1.2.3	Editing Chapter 3
1.1.3	Publishing Project Management Book
1.1	Finished Development of the Project Management Book

## 3. Use the WBS and Activity List to develop the project activity sequence or logic



# Scheduling - Step 3. Determine the Relationship Between Project Activities

Once the sequence has been established, you need to determine the direct relationship between each activity. But how does sequencing differ from identifying the relationships of tasks and activities?

Sequencing is the order of how things will happen. First, second, third, etc.

Identifying direct relationships provides greater understanding to the project tasks and schedule. By identifying the relationships between activities in scheduling, you identify the sequence plus dependencies of tasks. There are 4 types of scheduling dependencies:

- FS – Finish to Start
- SS – Start to Start
- FF – Finish to Finish
- SF – Start to Finish

# Scheduling - Step 3. Determine the Relationship Between Project Activities

- FS – Finish to Start
- SS – Start to Start
- FF – Finish to Finish
- SF – Start to Finish

There are two methods for developing project sequence and relationships:  
Precedence Diagramming Method (PDM)  
Arrow Diagramming Method (ADM).

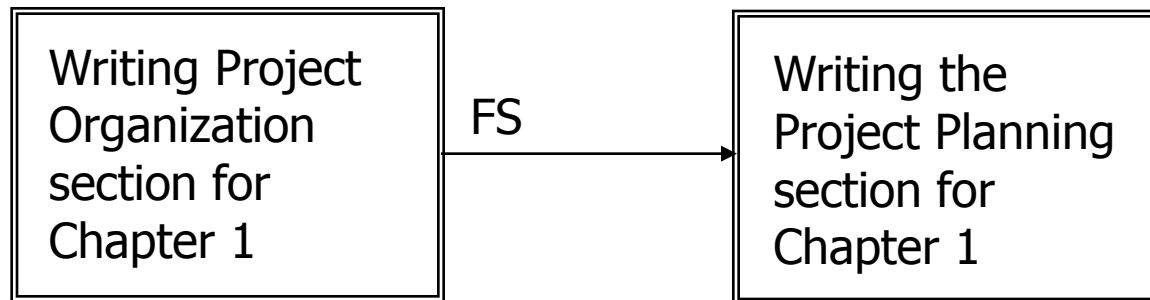
We will use PDM in this module but will not explore these scheduling methods in detail.

# Types of Scheduling Dependencies

The first type of relationship is called Finish to Start (FS). This means that activity “A” must finish before activity “B” can start.

Let’s look at this relationship using the BEST Management Books example:

## Finish-To-Start



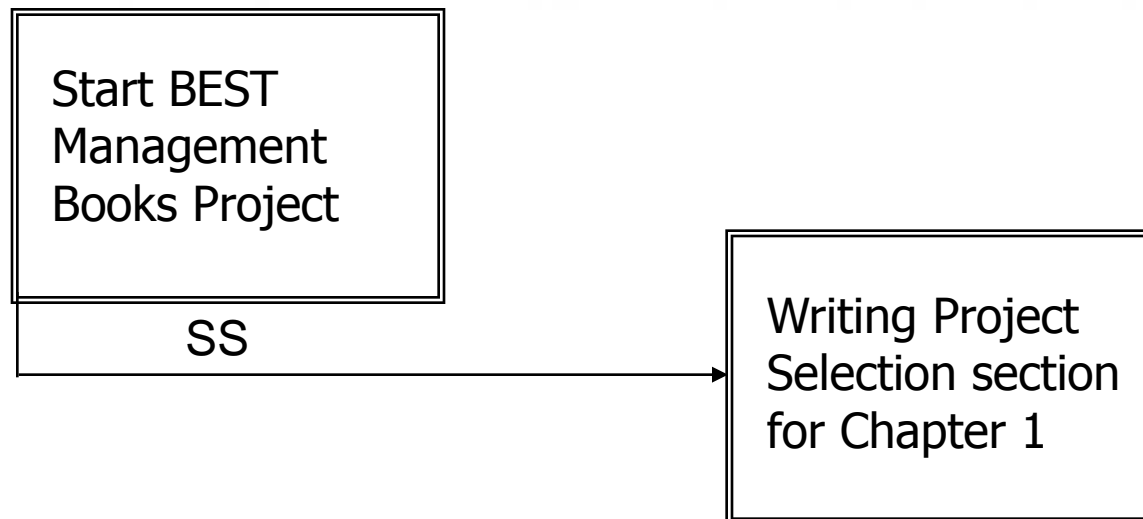
You must “**Finish**” writing the Project Organization section of Chapter 1 before you can “**Start**” writing the Project Planning section for Chapter 1.



# Types of Scheduling Dependencies

The second type of relationship is Start to Start (SS). This means that activity “B” can start as soon as activity “A” starts.

Let’s look at this relationship using the BEST Management Books example:  
**Start-To-Start**



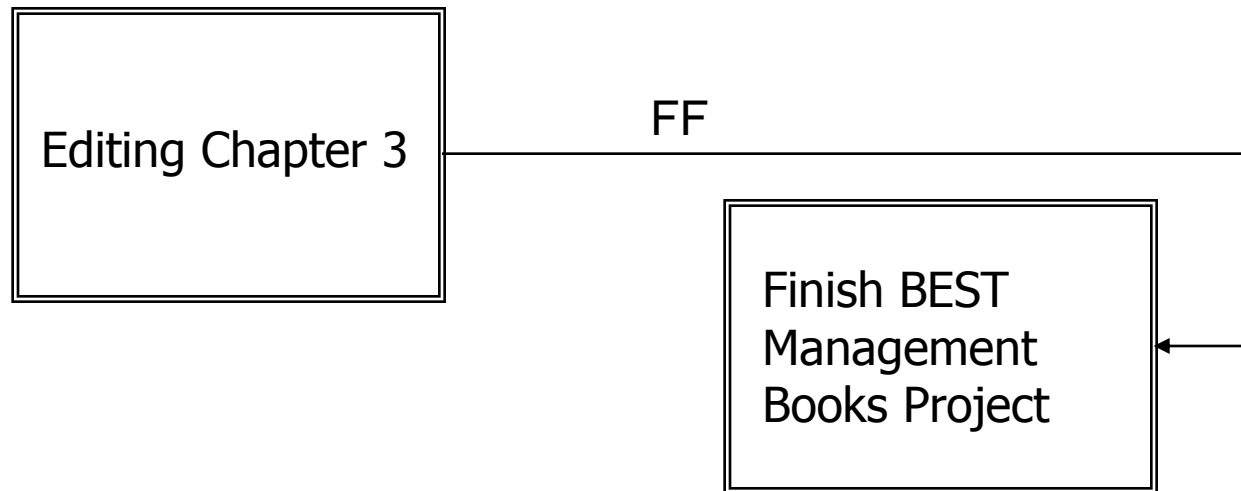
You can “**Start**” writing the Project Selection section for Chapter 1 as soon as you “**Start**” the BEST Management Books Project.

# Types of Scheduling Dependencies

The third type of relationship is Finish to Finish (FF). This means that activity “B” cannot finish until activity “A” finishes.

Let’s look at this relationship using the BEST Management Books example:

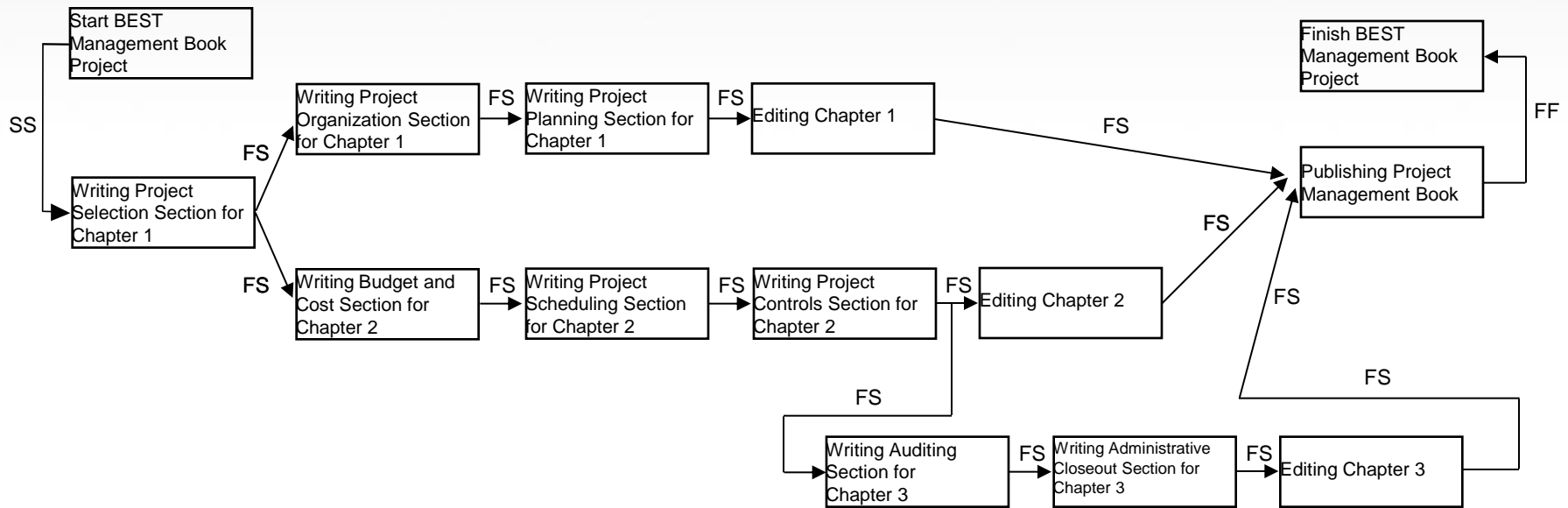
## Finish-To-Finish



You cannot **“Finish”** the project, Finish BEST Management Book Project, until you **“Finish”** Editing Chapter 3.

# Step 3. Determine the Relationship Between Project Activities

Using the relationships we have just described, the BEST Management Books project activities and the logical relationships among them is diagrammed below. This is formally known as a Network Diagram.



With the relationships defined, we now need to establish the duration for each activity.