

# 2

## FUNDAMENTALS OF PROJECT MANAGEMENT

### 2.0 DEFINITIONS/KEYWORDS

#### Activity ID

The performance of a particular operation or task such as site cleaning, marking, earthwork excavation, pouring of concrete into a beam and column, placing of reinforcement, etc., is called an activity. It needs time for its performance. These activities can be represented with a mere number with prefixes and suffixes. Activity ID is used to identify uniquely and describe the activity.

Activity is denoted by Bar. The Start Point of the Bar shows the Start or Early Start (ES) or Planned Start (PS) and the End Point shows the Finish or Early Finish (EF) of Planned Finish (PF) of the activity.

#### Example:

Activity ID	Activity Name	Original Duration (or) Planned Duration
BA 1000 S	Site cleaning	3d
BA 1010 S	Marking	2d
BA 1020 S	Earthwork excavation	5d

Here, prefix 'BA' represents 'Block -A', whereas suffix 'S' represents 'Structural work, and 'd' = days.

Each and every activity has an individual activity ID with 10 increments so that we can include activity in-between activity in future by using a buffer.

#### Activity Name or Description

Activity name or description represents the work that must take place for a determined amount of time. The activity name should convey all the aspects of activity like material type, the level at which executed.

#### Event

An event represents the commencement or completion of an activity and consumes no time, i.e., it does not need time or in other words an event is either the start or completion of an activity. An event is also known by the name as a node. More specifically it can be said that an event is a specific, definable accomplishment in a project plan recognizable at a particular instant of time.

### **Planned Start (PS)**

The planned time at which an activity can be started is known as planned start. It is denoted by PS.

### **Planned Finish (PF)**

The planned time at which an activity can be completed is known as planned finish time. It is denoted by PF.

$$\text{Planned Finish (PF)} = \text{Planned Start (PS)} + \text{Original Duration (OD)}$$

### **Activity Calendar**

The project period is represented with holidays.

### **Float**

The difference between the time available to do an activity and the time required to complete the activity is known as float. It is thus the time by which the activities can be delayed without delaying the completion of the project.

The term float is associated with the activity times. It is analogous to the term slack which was associated with the event times. Just as the slack denotes the flexibility range within which an event can occur (it is the difference between the earliest event time and latest event occurrence time), float denotes the range within which an activity start time or its finish time may fluctuate without affecting the completion of the project.

Floats are of types:

1. Total float
2. Free float
3. Independent float
4. Interfering float

### **Total Float (TF)**

The amount of time by which the selected activity can be delayed without delaying the project finish date or in other words the difference between the latest finish time and the earliest finish time is called the total float. In other words, it is the time span by which the starting (or finishing) of activity can be delayed with delaying the completion of the project. In certain activities, it will be found that there is a difference between maximum time available and the actual time required to perform the activity. This difference is known as the total float. It is denoted by TF. Thus:

$$\text{Total float (TF)} = \text{Total time} - \text{Activity duration}$$

### **Free Float (FF)**

The amount of time by which finishing of an activity can be delayed without delaying the earliest start for the following (immediate successor) activity is called free float. Or in other words, free float is that portion of the positive total float that can be used by an activity without delaying any succeeding activity (or without affecting the total float of the succeeding activity). The concept of free float is based on the possibility that all the events occur at the earliest times. (All activities start as early as possible.) It is denoted by FF.

The critical float paths are based on the longest path. The most critical path will be identified to the critical path that is derived when you choose to define critical activities as the longest path in the General tab. In a multi-calendar project, the longest path is calculated by identifying the activities that have an early finish equal to the latest calculated early finish for the project and tracing all driving relationships for those activities back to the project start date. After the most critical path is identified, the module will calculate the remaining sub-critical paths.

**Critical path**

The critical path is the longest continuous path of activities through a project that determines the project end date. A delay in one activity delays other activities and the project as a whole.

It represents the series of activities in which each activity has zero float or has no float time. This path is known as a critical path. The critical path determines the minimum time required to complete a project.

**Critical activities**

In a multi-calendar project, the longest path is calculated by identifying the activities that they have an early finish equal to the latest early finish for the project and tracking all driving relationships for those activities back to the project start date.

When more than one project is open, to identify critical activities in a project, the critical activities are identified based on the setting in the default project.

**Predecessor and Successor relationships**

To define relationships with other activities in the same project or in different projects.

**Predecessor**

The activities that occur before another activity are called predecessor activities to that event.

**Successor**

The activity or that follows another event is called successor activity to that activity.

**Data Date (DD)**

The data date is the 'time now' or the date up to which progress is reported and from which remaining will be scheduled. The formula used to schedule the project is  $DD + 1$ .

**Lag**

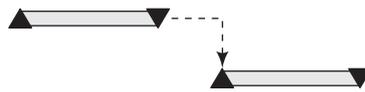
When a successor activity cannot start or finish as soon as its predecessor starts or finishes, you can define a lag time for the relationship. Lag is the number of time units from the start or finish of activity to the start or finish of its successor. Lag can be a positive or negative value. For example, a start to start a relationship with a three-day lag indicates that the successor activity can start three days after the start of its predecessor.

**Milestone**

Milestones are key events or points in time, which can be identified when they are completed during the project's progress. Two important points to be noted are:

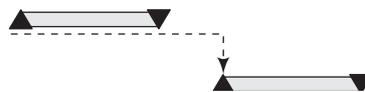
**Finish to Start (FS)**

The successor activity can begin only when the predecessor activity completes.



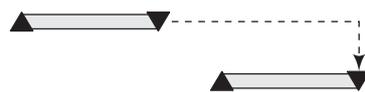
**Start to Start (SS)**

The start of the successor activity depends on the start of the predecessor activity.



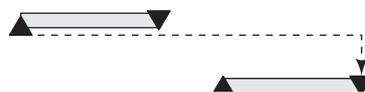
**Finish to Finish (FF)**

The finish of the successor activity depends on the finish of the predecessor activity.



**Start to Finish (SF)**

The successor activity cannot finish until the predecessor activity starts.



**2.2 ACTIVITY TYPE**

Duration type and percent complete type; whether an activity is a start or finish milestone; how to keep an activity's unit values, duration values, and resource units/time values synchronized; and how to calculate an activity's percent complete.

**2.2.1 Task Dependent**

Task dependent is used to indicate the activity with duration.

**2.2.2 Start Milestone**

Start Milestone to indicate that the activity marks the beginning of a major stage in the project.

**2.2.3 Finish Milestone**

Finish Milestone to indicate that the activity marks the completion of a major stage in the project.

### 2.2.4 WBS Summary

WBS Summary to indicate that the activity's duration is dependent on the activities assigned to the same WBS level.

## 2.3 DURATION TYPE

**Fixed Units/Time:** If you want the resource units per time to remain constant and the remaining units to change. This type is used when the activity has fixed resources with productivity output per time period. You must often choose this duration type when you are using resource-dependent activities.

**Fixed Duration and Units/Time:** If you want the activity duration to remain constant and the remaining units to change. This type is used when the activity should be completed within a fixed time period regardless of the resources assigned. You must often choose this duration type when you are using resource-dependent activities.

**Fixed Units:** If you want the activity units to remain constant and the units per time change. This type is used when the total amount of work is fixed and increasing the resources can decrease the activity duration. You must often choose this duration type when you are using resource-dependent activities.

**Fixed Duration and Units:** If you want the activity duration to remain constant and the units/time to change. This type is used when the activity is to be completed within a fixed time period and the total amount of work is fixed. You must often choose this duration type when you are using task dependent activities.

**WBS:** The assigned Work Breakdown Structure (WBS) element of the selected activity. To assign a new WBS element to the selected activity.

## 2.4 CONSTRAINTS

**Primary:** The selected activity's primary constraint type: Start On, Start On or After, Start On or Before, Finish On or After, Finish On or Before, As Late As Possible, Mandatory Start or Mandatory Finish.

**Date:** The selected activity's constraint date.

**Secondary:** The selected activity's Secondary Constraint type. This list is filtered based on the value you select in the Primary field.

**Budgeted:** The expected number of labour or non-labour units or cost or material cost that the selected activity will use, depending on your current display. You can type a new budgeted cost.

## 2.5 DURATION

**Original:** The planned number of working days required to complete the activity.

**Actual:** The actual number of days spent to complete the selected activity.