MGMT 8020 Project Planning and Scheduling - 16 hours (1.6 CEUs)

COURSE OBJECTIVES

After completing this course, students will know:

- A step-by-step method for planning and scheduling your projects
- How to enter tasks and time durations in Microsoft® Project
- How to connect tasks and build a working project model
- How to enter resources and assign them to tasks

PREREQUISITE MGMT 8010 Introduction to Project Management/Instructor's approval

TEXTS *A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 6th Edition*, Project Management Institute, 2017

Microsoft® Project 2016 Step by Step, Microsoft® Press, 2016

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Module 1

Module Objectives

The objectives of this module are:

- Learn a step-by-step method for planning and scheduling your projects
- Learn about a tool for assigning resources to project tasks
- Learn how to estimate the durations of project tasks
- Become familiar with Microsoft® Project

Reading Assignments

PMBOK® Guide, Chapters 6, 9

Microsoft® Project Step by Step, Appendix A, Chapters 1, 2

Planning Your Project

Planning for a project is difficult. The *PMBOK® Guide* is an impressive document that thoroughly discusses a generalized framework to planning and managing a project. The *PMBOK® Guide* approach is appropriate for very large projects. However, project planning using the *PMBOK® Guide* approach takes a long time, sometimes months. Because of this long time, some project managers of smaller projects are tempted to skip the planning process to get to the "real" part of the project.

Another problem with typical project plans is that there is no allowance for increases in duration or cost of each task. This lack of built-in schedule contingency and cost contingency may lead to overruns in the project schedule and budget.

A simplified seven step planning process enables organizations to plan their projects in one day. Each step has a chart associated with it, listed as follows:

1. Project Success Chart™
2. Work Breakdown Structure
3. Task Assignment Matrix
4. Task duration table
5. Project network diagram
6. Gantt (bar chart) schedule
7. Project budget chart

In addition to the usual schedule planning methodology, it creates schedule and budget contingencies for the project, protecting against schedule and cost overruns. To illustrate these steps, a project of building a house will be used as an example.

Step 1 – Project Success Chart™

The ***Project Success Chart***™ lists the factors vital to the success of the project – the project objective, the project deliverable(s), the project measures of success, and the scope summary. In the *Introduction to Project Management* course, we learned that the Project Success Chart™ is a specific format of the Project Charter, the *PMBOK® Guide* terminology for this type of chart. The advantage of the Project Success Chart™ is that the elements of the project that enable its success can be communicated to the project team members in a very short period of time.

1. The **project objective** is what will be achieved by when. In our previous example, the project objective was "Build a 3,000 sq ft house with 4 bedrooms and 3 ½ baths and a two-car garage plus driveway and landscaping of front yard by 6/01/XX."
2. The **project deliverable(s)** are what will be delivered by when. In this case, our project deliverable is a 3,000 sq ft house with 4 bedrooms and 3 ½ baths, a two-car garage, and front yard landscaping to be delivered by 6/01/XX.
3. **Measures of project success** list what will meet or exceed the expectation of each stakeholder. An example is shown below.

Stakeholders	Measures of Project Success (what will meet or exceed the expectation of each stakeholder)
Owners	**On budget, on time, to specifications**
Owners' family	**Family activity room, play area, swimming pool**
Contractor	**Make fair profit**
Workers	**Fair pay and benefits, good working conditions**
Lender	**On budget, on time**

Measures of Project Success Example

4. The **Scope Summary Chart** summarizes the scope of a project. An example is shown below.

Project Characteristics	Is in Project Scope	Is Not in Project Scope	Project Scope Changes
4 bedrooms	**X**		
3 ½ baths	**X**		
Two-car garage	**X**		
Driveway	**X**		
Front yard landscaping	**X**		
Family activity room	**X**		
Back yard landscaping		**X**	
Play area	**X**		**Added Scope 8/06/XX**
Swimming pool	**X**		**Added Scope 9/15/XX**
Tennis court		**X**	

Scope Summary Chart Example

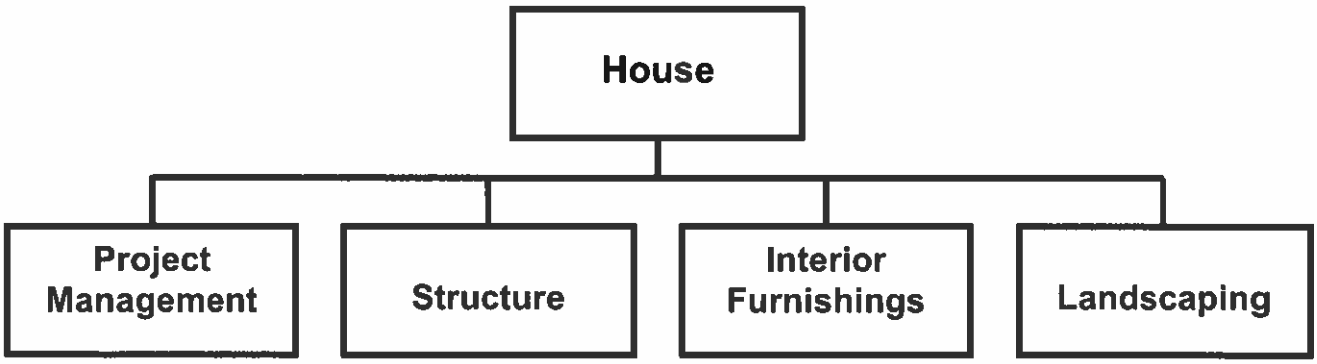
Step 2 – Work Breakdown Structure (WBS)

The ***Work Breakdown Structure (WBS)*** is a method of determining the tasks to be performed in the project. One process of generating the Work Breakdown Structure is to break the project into the major project deliverables, and then into sub-deliverables, and then into work packages

A work package is defined in the *PMBOK® Guide* as "the work defined at the lowest level of the work breakdown structure for which cost and duration can be estimated and managed."

For example, for a house project, the sub-deliverables might be the Structure, the Interior Furnishings, Landscaping, etc. In many projects, there is also an integration function, which might be termed Project Management. These sub-deliverables are broken down into lower

levels until; the work package level is reached. For example, the Work Breakdown Structure for the House project might look like:



Work Breakdown Structure for a House Project

Another way to create a Work Breakdown Structure is by project phases. For example, in Figure 5-13 of the *PMBOK® Guide*, the project has the following phases:

- Product Requirements
- Detailed Design
- Construct
- Integration and Test

The work packages at the lowest level of the Work Breakdown Structure should be the same whatever method is used.

The project tasks are derived by listing the tasks that have to be accomplished to complete the work packages. In this simplified example, we will assume that there is a one-to-one correspondence between the work packages and the project tasks, as follows:

Work Packages	Project tasks
House Design	Design house
Contractor Selection	Select contractor
Graded Lot	Grade lot
House Foundation	Build foundation
House Framing	Frame house
Roof	Put on roof
House Exterior	Finish exterior
House Interior	Finish interior
Appliances	Buy appliances
Furniture	Buy furniture
Appliance Installation	Install appliances
Furniture Installation	Install furniture
Landscaping	Install landscaping

Step 3 – Task Assignment Matrix

Tools and techniques for resource planning of the project are discussed in section 9.1.2 of the *PMBOK® Guide.* One of the tools is a matrix chart called the Responsibility Assignment Matrix (RAM), which lists the tasks and the responsibilities of the project team members. The Task Assignment Matrix is a similar chart that lists the project tasks and the following information:

- Task Owner – who owns (is responsible) for the task
- Support – who needs to provide support to the Task Owner
- Inform – who the Task Owner needs to inform
- Approve – who approves the results of the task

For example, a Task Assignment Matrix for the house project might look like:

Task	Task Owner	Support	Inform	Approve
Design house	**Designer**			**Owner**
Select contractor	**Owners**		**Lender**	
Grade lot	**Contractor**	**Graders**		
Build foundation	**Contractor**	**Masons**	**Lender**	**Inspectors**
Frame house	**Contractor**	**Framers**		
Put on roof	**Contractor**	**Roofers**	**Lender**	
Finish exterior	**Contractor**	**Carpenters**	**Lender**	
Finish interior	**Contractor**	**Carpenters**	**Lender**	
Buy appliances	**Owners**			
Buy furniture	**Owners**			
Install appliances	**Owners**	**Appliance co.**		
Install furniture	**Owners**	**Furniture co.**		
Install landscaping	**Contractor**	**Landscapers**		
Complete house	**Contractor**	**Inspectors**	**Lender**	**Owner**

Task Assignment Matrix for a House Project

Step 4 – Task Duration Table

Estimating the durations of project tasks is difficult, especially for project tasks that have not been performed in previous projects. Some of the factors that influence the quality of schedule and cost estimates are listed as follows:

Factors	Influence on Quality of Estimates
Past experience	**Experience in performing similar tasks in the past**
Planning horizon	**Tasks are more uncertain when they will be performed farther in the future**
New technology	**Tasks involving new technology are more uncertain**
People factor	**The experience that the resources have in doing similar tasks in the past and their skill level determine how long a task will take**
Padding estimates	**Resources will pad their estimates to increase the probability of achieving their schedule and cost estimates**
Organizational culture	**Some organizations are more strict in enforcing schedule and cost estimates**
Non-project factors	**Higher project priority can affect how much schedule and cost contingency is added to the estimate**

Factors that Influence the Quality of Schedule and Cost Estimates

Guidelines for schedule and cost estimates are listed in the following table:

Factor	Guideline
Responsibility	**Bottom-up estimating should be done by the resource who is most familiar with the task**
Normal conditions	**Estimates should be based on the normal conditions encountered in the past**
Time units	**Task estimates should usually use the same cost and time units**
Independence	**Each task should be estimated independent of the other tasks**
Contingencies	**Each task estimate should not include contingencies**

Guidelines for Schedule and Cost Estimates

It is important to realize that adding up estimates will usually be insufficient because there are uncertainties involved in performing projects. One of the ways to characterize these uncertainties uses a technique referred to as the Project Evaluation and Review Technique (PERT). This technique was originally used in the 1950's for developing Polaris nuclear submarine and missiles because of the large uncertainty in developing these products. The PERT technique is receiving more attention because of the large uncertainties in high-technology projects.

The PERT technique involves performing a three-point estimate for each task. These three types of estimates are defined as follows:

- Optimistic – based on a best-case scenario
- Pessimistic – based on a best-case scenario
- Most likely – the most likely duration, based on the resources likely to be assigned, their productivity, realistic expectations of availability, dependencies on other participants, and interruptions

The ***Task Duration Table***, shown below, lists three estimates for each task – optimistic, most likely, and pessimistic. The optimistic values usually have a probability of occurring 10-20% of the time, the most likely values 50% of the time, and the pessimistic values about 80-90% of the time. These percentages can be varied depending on the schedule criticality of the project end date. For example, a house project may have the following three-point duration estimates for the project tasks:

	Optimistic (days)	Most Likely (days)	Pessimistic (days)
Initiate house project	-	0	-
Design house	10	20	30
Select contractor	5	10	20
Grade lot	5	10	20
Build foundation	5	10	20
Frame house	10	20	30
Put on roof	5	10	30
Finish exterior	10	20	30
Finish interior	10	20	30
Buy appliances	5	10	20
Buy furniture	5	10	20
Install appliances	5	10	20
Install furniture	5	10	20
Install landscaping	5	10	20
Complete house project	-	0	-

Task Duration Table for House Project

Microsoft Office Project Features

Reading Assignment: *Step by Step*, Appendix A, Chapters 1 and 2

Step by Step, Appendix A discusses the characteristics of a project as defined by the Project Management Institute (PMI) in A *Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*). A project is:

- temporary
- an endeavor
- creates a unique product, service, or result

Appendix A also discusses the Project Triangle (seeing projects in terms of time, cost, and scope), managing project constraints, and managing your projects with Microsoft Project.

Step by Step, Chapters 1 and 2 discuss the overall features of Microsoft Project. If you do not already have access to Microsoft Project, you can download a trial version from the Microsoft website at http://www.microsoft.com/en-us/evalcenter/evaluate-project-professional-2016.

As noted in Chapter 1, Microsoft Project comes in two desktop versions – Project Standard, the desktop version, and Project Professional, the enterprise version. In addition, there are three online versions.

The Gantt Chart view, shown on page 15 of the book, is the primary view used to create project schedules.

Module 1 Summary

We learned in Module 1:

- A step-by-step method for planning and scheduling your projects
- A tool for assigning resources to project tasks
- How to estimate the durations of project tasks
- The basic features of Microsoft® Project

Individual Project Assignment

The purpose of the Individual Project is to give you practice in the project planning and scheduling process. You may use a real project, or you may make up a project. Some guidelines for choosing a project are:

- The total project budget should be more than $50,000
- The project duration should be at least 30 days
- The project should involve more than one function

Some examples of projects that have been used previously are:

- Office automation
- Volunteer service/fund raising
- Data processing system
- Waste management
- Adult education
- Synthetic fuels development
- Political campaign
- Neighborhood beautification
- Medical system installation
- New product development
- YMCA/YWCA fitness projects
- Water quality testing
- Wedding
- Company relocation
- Building a home

Select a project of your choice. The first assignment for this Individual Project is to create a Task Assignment Matrix and a Task Duration Table for your project, as described in this module. Submit these charts by the date shown in the Syllabus.

If you did not take MGMT 801 or you wish to select a new project for MGMT 802, submit the Project Success Chart™ and the Work Breakdown Structure (WBS) for the new project in addition to the Task Assignment Matrix and Task Duration Table.

Step by Step Assignment

No *Step by Step* submittal is required for this module.

Discussion Postings

There are no discussion postings for this course.