WBS, task, durations

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ADMINISTRATION IN KARVINA

How to create WBS of your project

Taks, durations and linkages between tasks

Time estimations for project activities

Project Management

How the lecture will be conducted?

1. The lecture is divided into **three blocks**, where each block introduces an issue (1. Project planning, 2. MS Project WBS, 3. MS Project tasks and durations)

2. After each block there is a quiz for feedback on whether you have understood everything.

3. We use **MS Teams**, a shared whiteboard for your engagement and reactions. Also we are working with MS Project.

4. The class is supplemented with **quizzes in vevox**, the link is always in the presentation.

Contents

1. **PART** (40 min.)

- Project planning, theoretical overview.

2. **PART** (20 min.)

- MS Project WBS, introducing the WBS in MS Project.

3. **PART** (30 min.)

- MS Project tasks and durations, demonstration of how to create tasks, define the duration of each task.

Learning objectives

After studying this topic, you should be able to:

- Divide the project into subparts.

- Using the Work Breakdown Structure.

- Learn how to use WBS in MS Project.

- Create tasks and define their times in MS Project, working with Gantt chart.

Key readings

You can find support in the following sources:

- Book – Chatfield and Johnson (2016). MS Project 2016 Step by Step (Part 3 Start a new plan, Part 4 Build a task list)

- Book – Heldman, K. PMP Project Management Profesional Exam – Study Guide (2013). Chapter 3 (Creating the WBS, Plan Scope Management)

MS Project Tutorials – basic setup, tasks:

- https://www.youtube.com/watch?v=sYy-iFzz1Eo

- https://www.youtube.com/watch?v=tuCrTKMPu_Y

PART 1

Project planning

Typical problems with developing objectives include:

- Project objectives/goals are not agreeable to all parties.
- Project objectives are too rigid to accommodate changing priorities.
- Insufficient time exists to define objectives well.
- Objectives are not adequately quantified.
- Objectives are not documented well enough.
- Efforts of client and project personnel are not coordinated.
- Personnel turnover is high.

Project Planning

These information requirements are:

- The statement of work (SOW)
- The project specifications
- The milestone schedule
- The work breakdown structure (WBS)

- The statement of work (SOW) is a narrative description of the work to be accomplished. It includes the objectives of the project, a brief description of the work, the funding constraint if one exists, and the specifications and schedule.

Tasks	Tasks include developing a website on WordPress, redesigning the Homepage and getting Michel's approval. Once the design is approved, the task is to redesign the other six pages based on that.		
Schedules	Design on staging environment should be set up by March 18, 2021. Implementation of final design should be made live by March 23, 2021.		
Standards and testing	This project has no industry or compliance standards. The Infosystems will run tests on the staging environment before it is deployed.		
Project Requirements	Infosystems will use their resources to build the communication website.		
Definition of Success	The communication website must be built on WordPress with an appealing and easy to use design.		
Payment Terms	A payment of USD 9,400 will be wired upon the final delivery of the project. Infosystems must have a W-9 on file before a payment is made.		
Signature		Signature	
Date		Date	
Project Sponsor		Senior Manager	

Project Planning

- The successful accomplishment of both contract and corporate objectives requires a plan that defines all effort to be expended, assigns responsibility to a specially identified

- Organizational element, and establishes schedules and budgets for the accomplishment of the work.

- Development of the work breakdown structure (WBS). A WBS is a product-oriented family tree subdivision of the hardware, services, and data required to produce the end product.

Example of a Delivered-Base Work Breakdown Structure for Construction
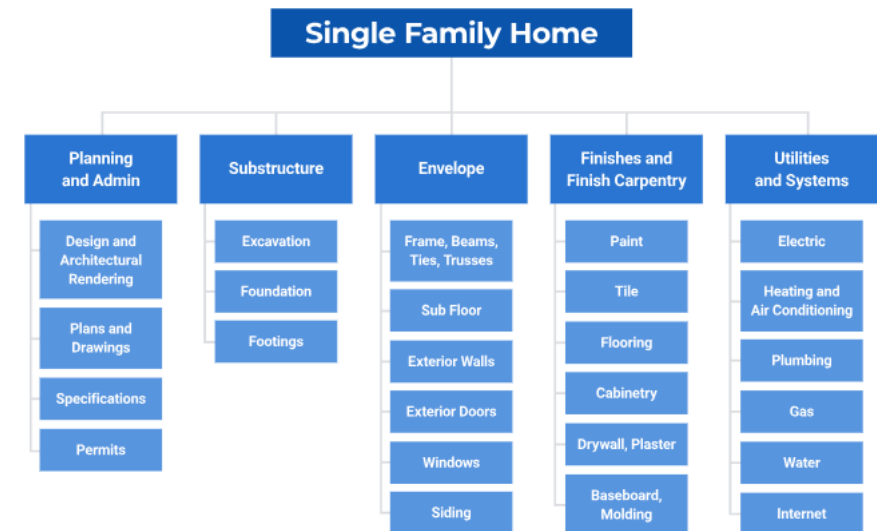
Project Planning

- Preparation of the WBS also considers other areas that require structured data, such as scheduling, configuration management, contract funding, and technical performance parameters.
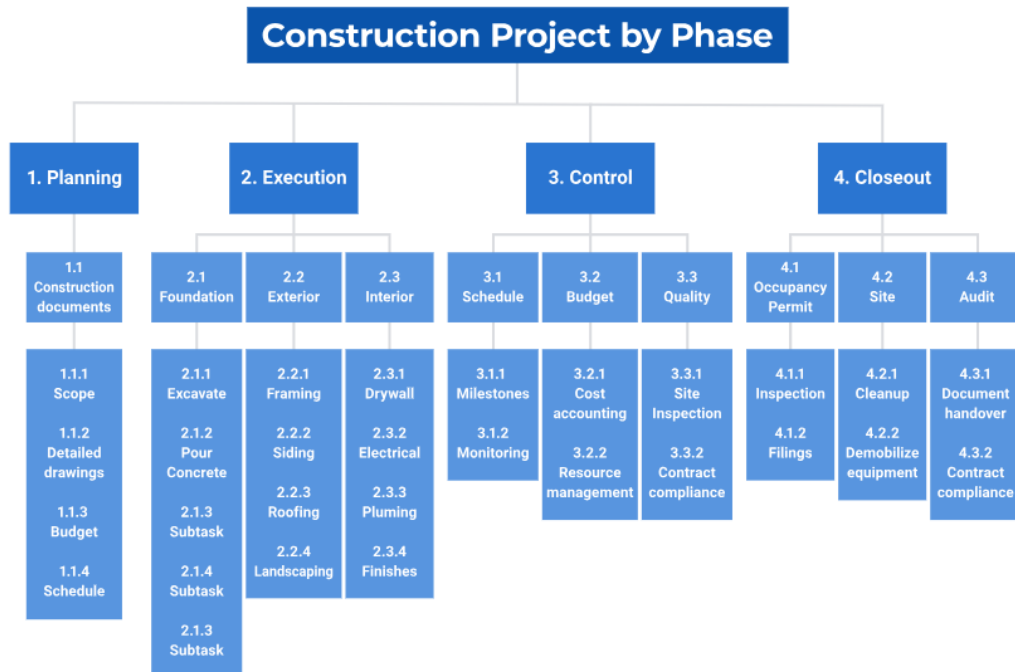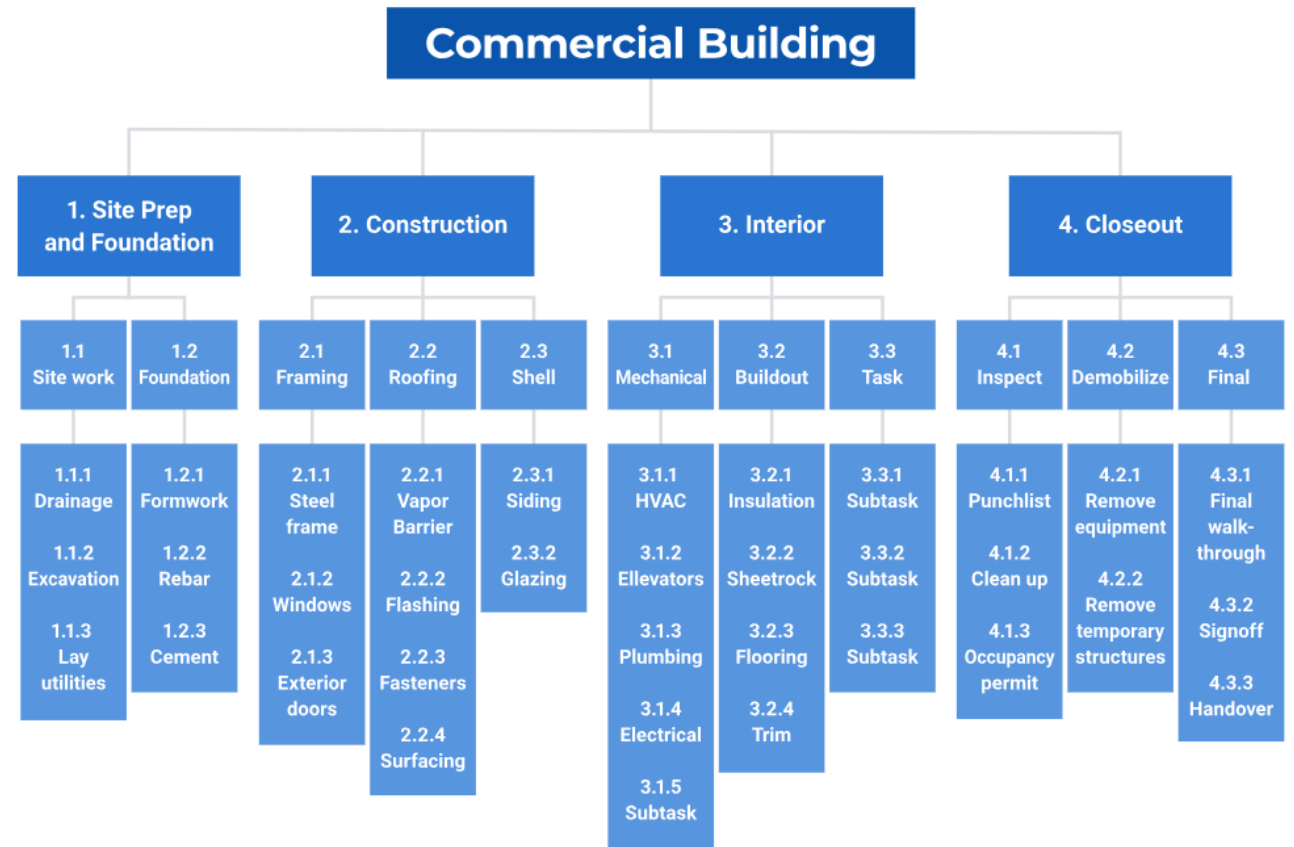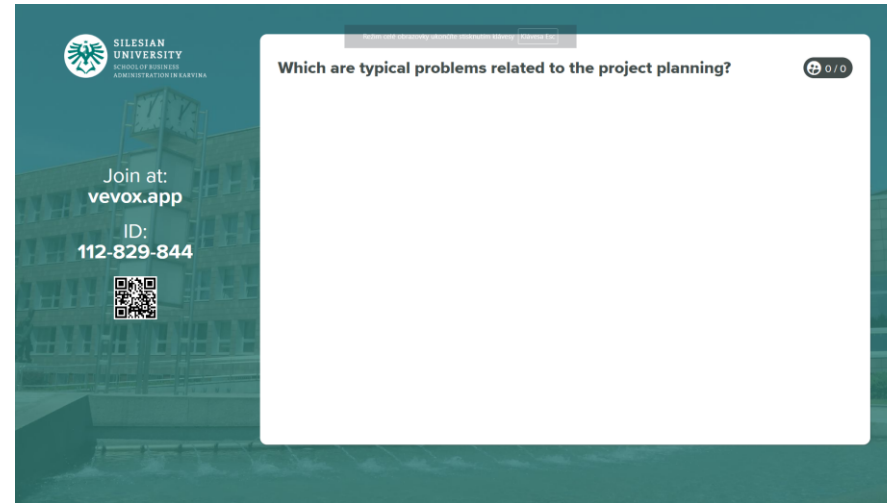
- Although a variety of work breakdown structures exist, the most common is the six-level indented structure.

- The **work breakdown structure** can be used to provide the basis for:
  - The responsibility matrix
  - Network scheduling
  - Costing
  - Risk analysis
  - Organizational structure
  - Coordination of objectives
  - Control (including contract administration

		Level	Description
Managerial levels		1	Total program
		2	Project
		3	Task
Technical levels		4	Subtask
		5	Work package
		6	Level of effort

Project Planning

Work breakdown structure for objective control and evaluation

- The WBS must be accompanied by a description of the scope of effort required, or else only those individuals who issue the WBS will have a complete understanding of what work has to be accomplished.

Source: Kerzner, H. 2017. Project Management
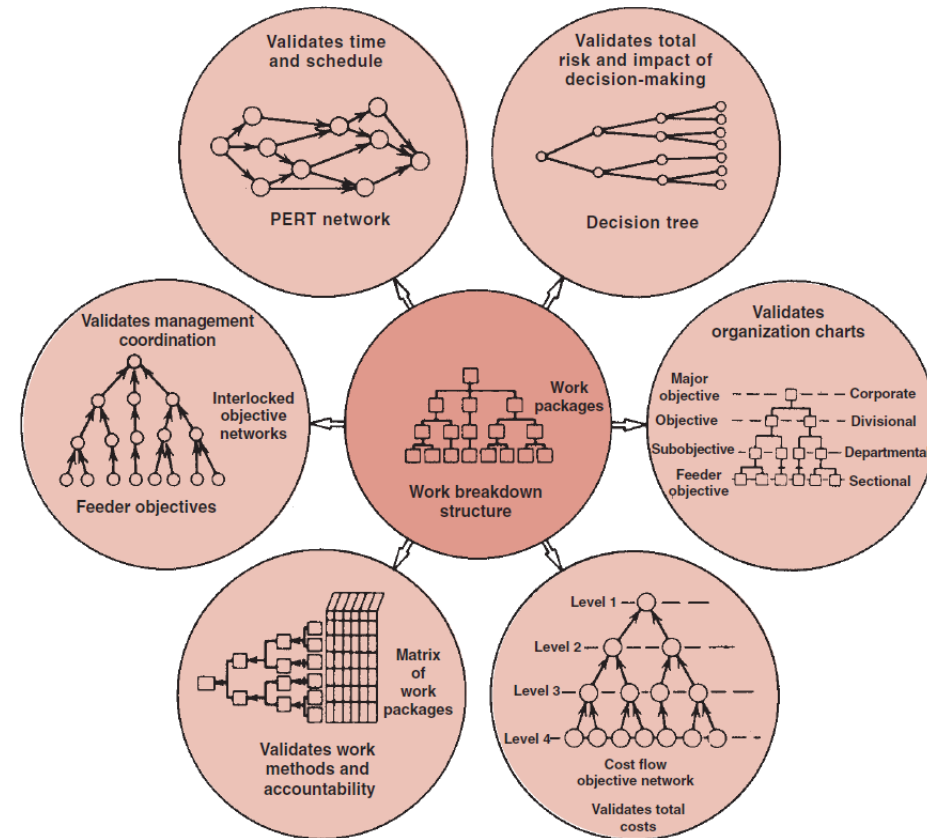
Project Planning

In setting up the work breakdown structure, tasks should:

- Have clearly defined start and end dates

- Be usable as a communications tool in which results can be compared with expectations

- Be estimated on a "total" time duration, not when the task must start or end

- Be structured so that a minimum of project office control and documentation (i.e., forms) is necessary

For large projects, planning will be time phased at the work package level of the WBS.

- The work package has the following characteristics:

- Represents units of work at the level where the work is performed

- Clearly distinguishes one work package from all others assigned to a single Functional group

- Contains clearly defined start and end dates that are representative of physical accomplishment

- Specifies a budget in terms of dollars, man-hours, or other measurable units

Project planning
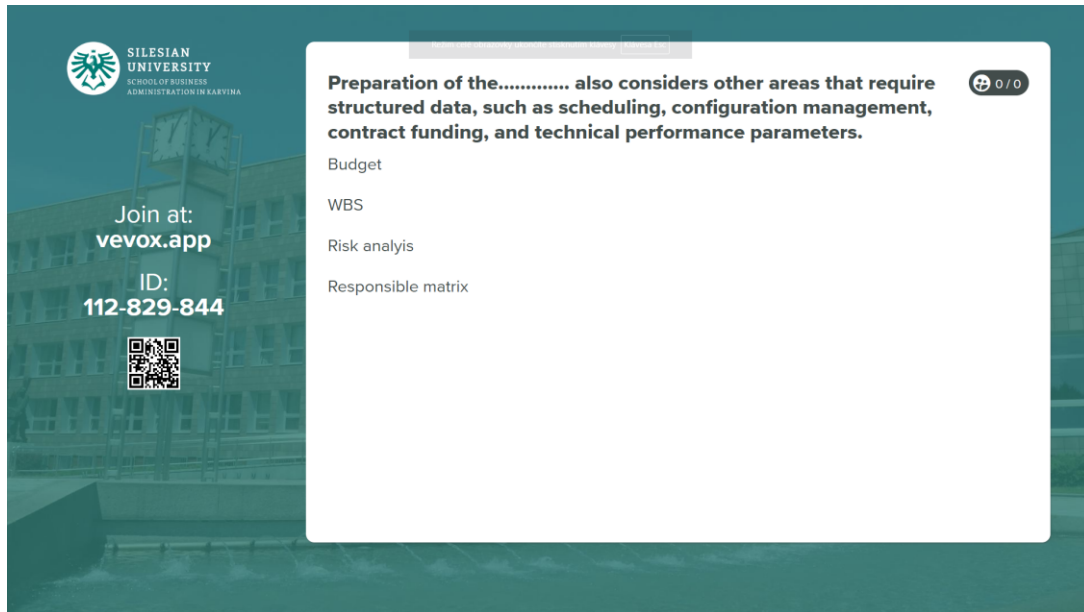
- On simple projects, the WBS can be constructed as a "tree diagram" or according to the logic flow.

- The second method is to create a logic flow and cluster certain elements to represent tasks and projects.

- In the tree method, lower-level functional units may be assigned to one, and only one, work element, whereas in the logic flow method the lower level functional units may serve several WBS elements.
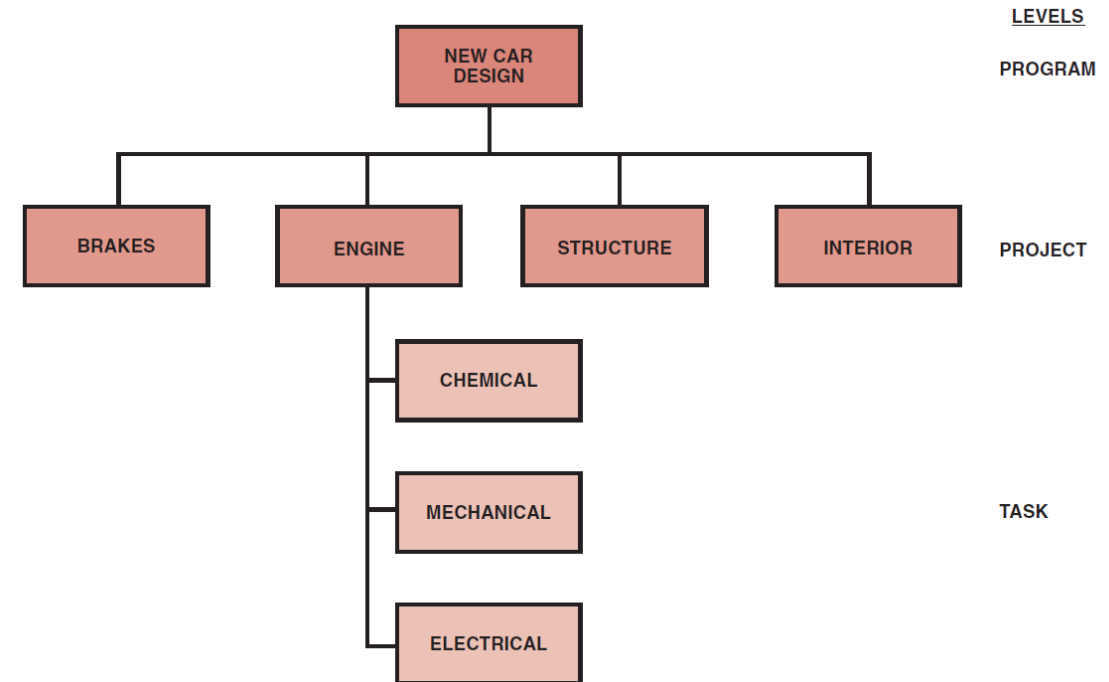
Source: Kerzner, H. 2017. Project Management

Vevox questions

Which are typical problems related to the project planning?

Preparation of the............. also considers other areas that require structured data, such as scheduling, configuration management, contract funding, and technical performance parameters.

Budget

WBS

Risk analyis

Responsible matrix

Join at:
vevox.app
ID:
112-829-844

https://silesianuniversity.vevox.com/#/meeting/449222/polls

PART 2

MS Project WBS

Introducing the WBS in MS Project

For orientation between tasks, it is advisable to structure the project into several phases, i.e. to create a hierarchical structure of activities - WBS (Work Breakdown Structure).

For easier orientation it is recommended **to insert a new column** (right mouse button in column header → insert new column "WBS code", this will create a sequential outline and de-composition of the individual tasks.

MS Project WBS

When entering tasks sequentially, it is necessary to create a "task indentation" to achieve a task structure, e.g. a summary task and this will consist of sub-tasks

For this procedure it is necessary to use two icons on the Task tab namely **Add Task** Indentation/Remove Task Indentation (icons are formed by a **green arrow**).

See – an example
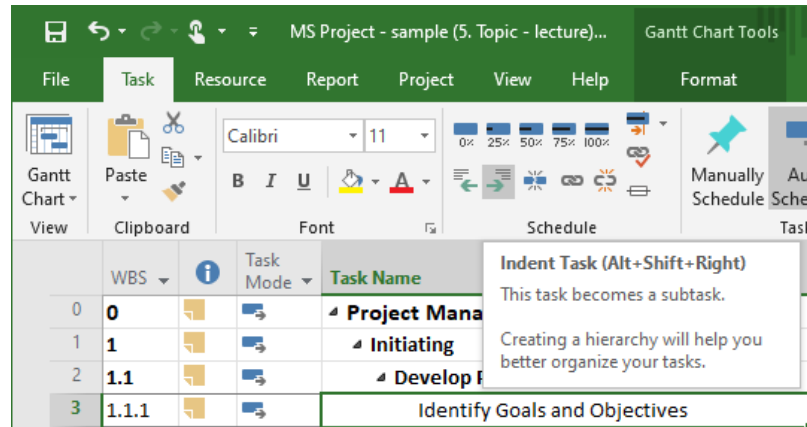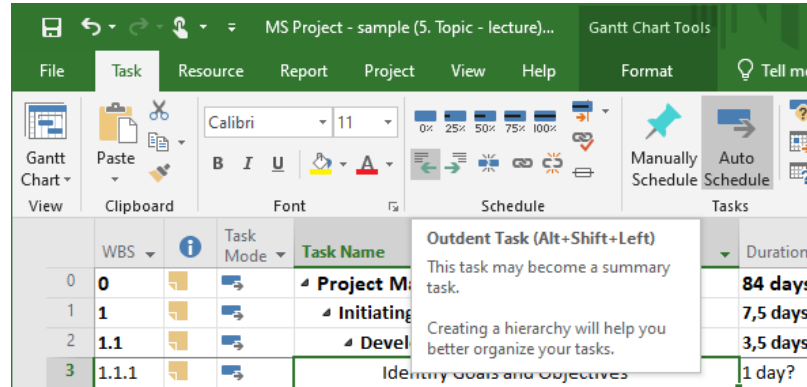
Project management focus: Top-down and bottom-up planning

- Top-down planning This approach identifies major phases or components of the project before filling in all the details required to complete those phases, which are represented in the plan as summary tasks. Complex plans can have several layers of nested summary tasks. This approach works from general to specific.

- Bottom-up planning This approach identifies as many of the bottom-level detailed tasks as possible before outlining them into phases or summary tasks. This approach works from specific to general.
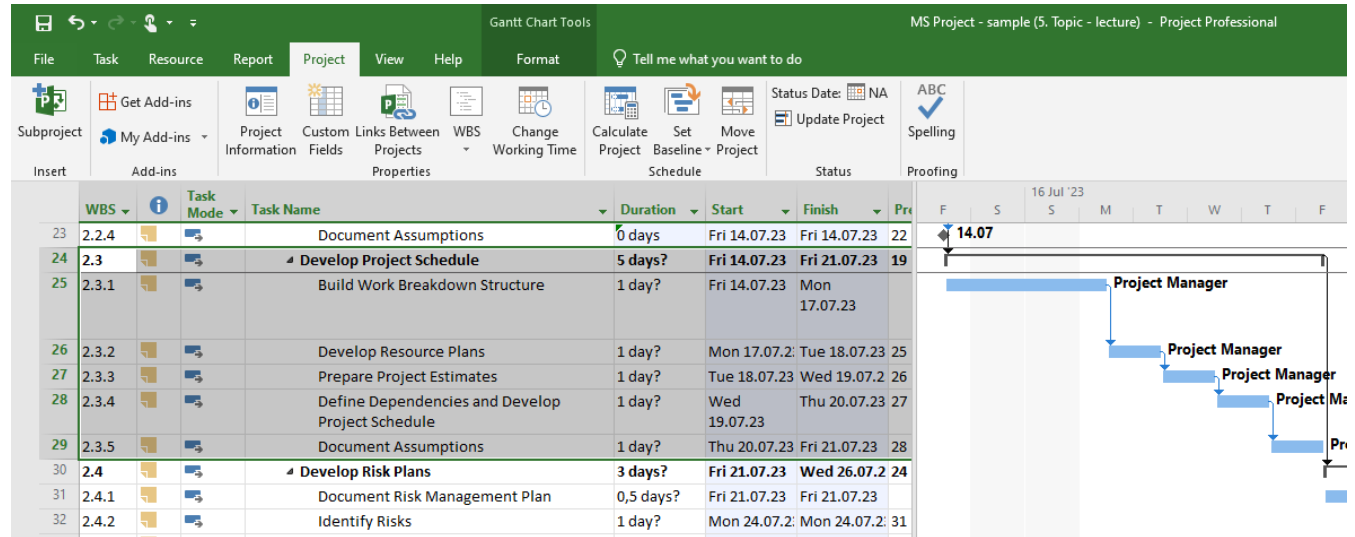
Creating accurate tasks and phases for most complex plans requires a combination of top-down and bottom-up planning. Typically, a project manager begins with established, broad phases for a plan (top-down planning), and the resources who will execute the plan provide the detailed tasks that fill out each phase (bottom-up planning).

MS Project WBS
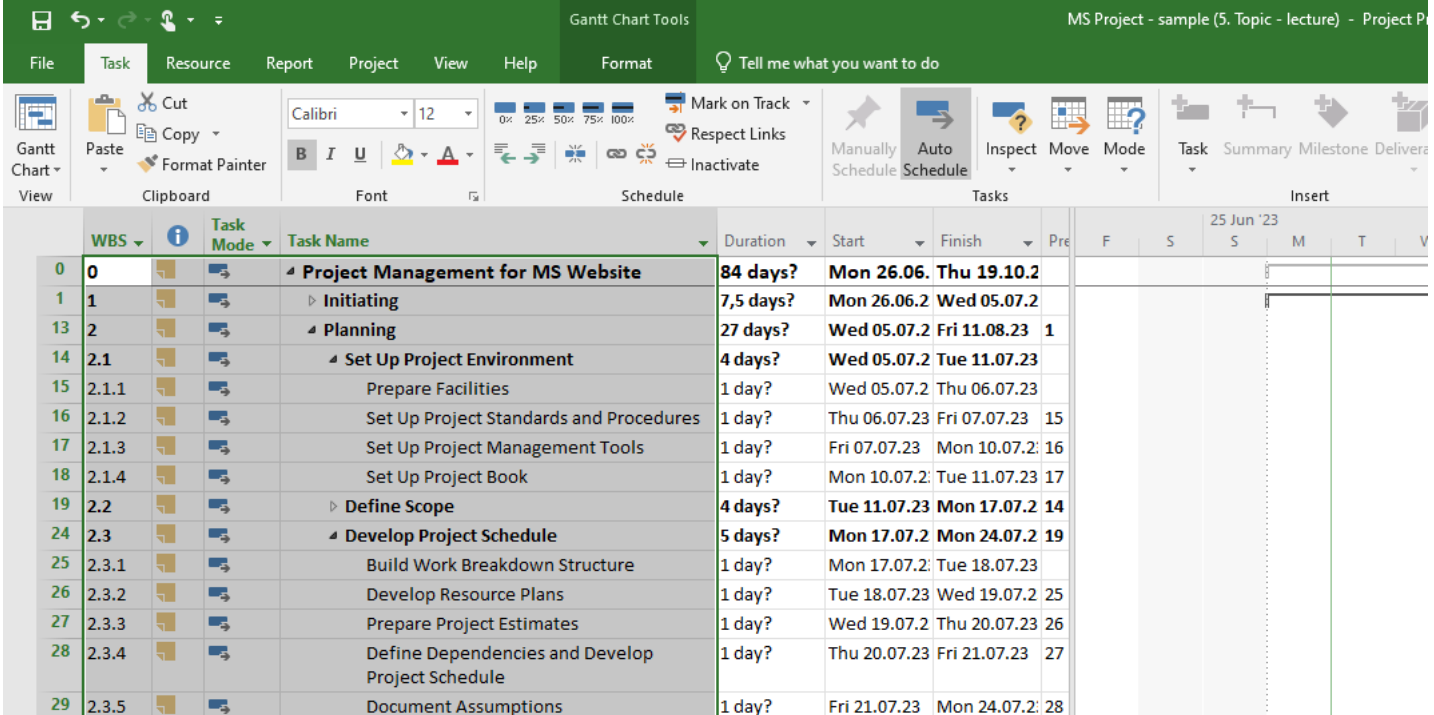
In this way you create a sequential WBS (the corresponding column called "WBS code") of your entire project.
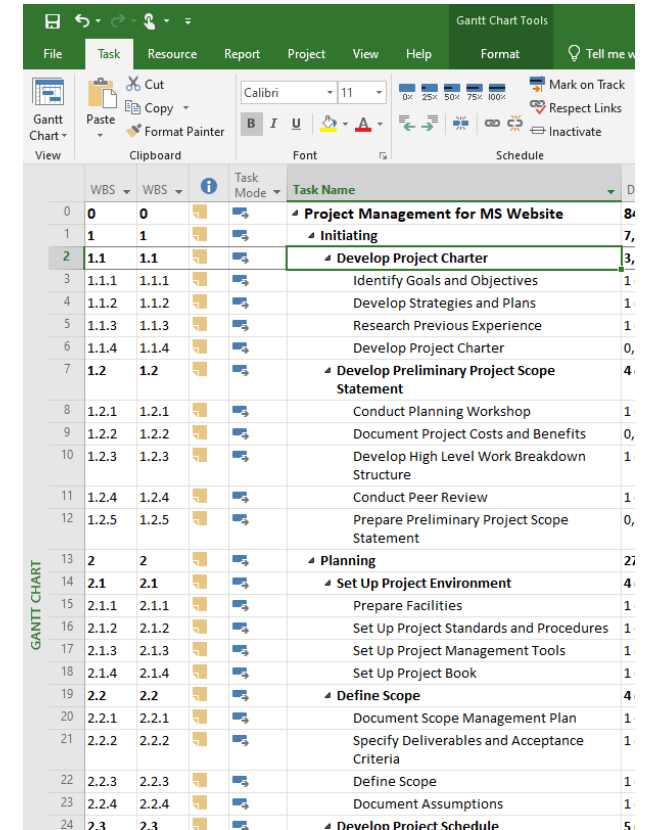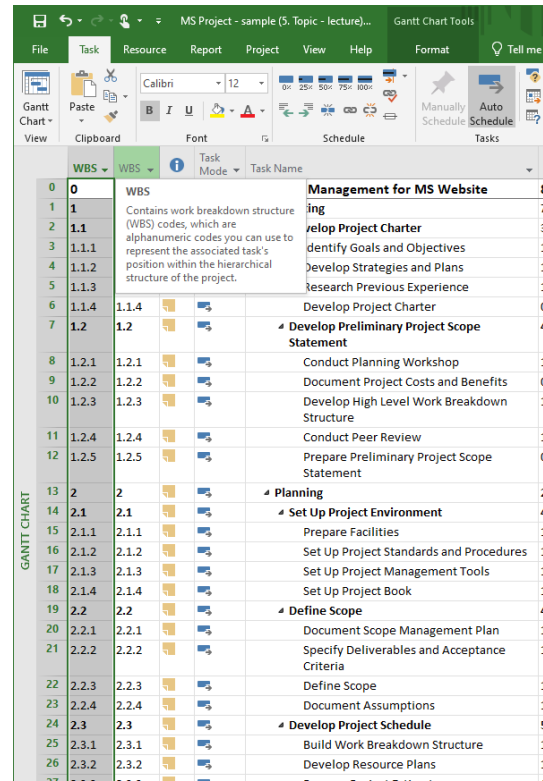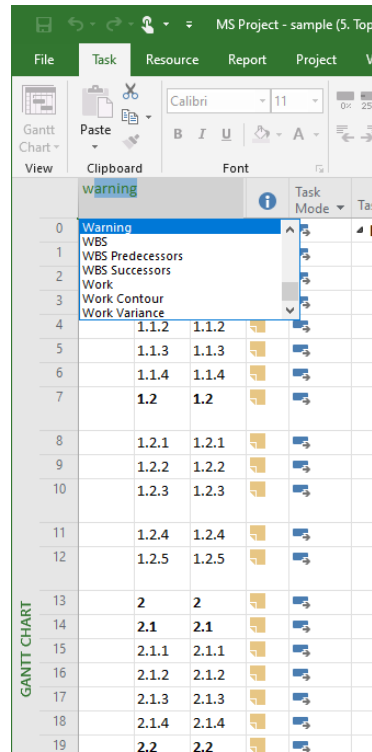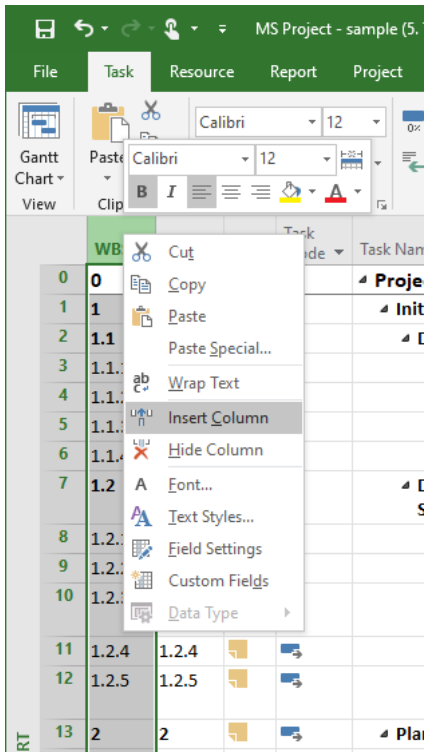
MS Project WBS

For orientation in the project, the WBS is used, where **summary tasks** are created (e.g. points 1, 2, etc.), under them there are **sub-tasks** (activities), e.g. 2.1, 2.1.1.

This is a practical application of the WBS on a project example, where you have a specific problem (task) and you need more sub-activities to solve it, so break it down into individual "**working packages**".

Vevox questions

PART 3

MS Project tasks and durations

Demonstration of how to create tasks, define the duration of each task.

- Tasks are the most basic building blocks of any project's plan.

- Tasks represent the work to be done to accomplish the goals of the project.

- Tasks describe work in terms of dependencies, duration, and resource requirements.

- In MS Project, there are several kinds of tasks. These include summary tasks, subtasks, and milestones.

- What are called *tasks* in Project are sometimes more generally called *activities* or *work packages*.

Create tasks

- Tasks represent the work to be done to accomplish the goals of the project. Every task in a plan is given an ID number, but the number does not necessarily represent the order in which tasks occur.

- Every task in Project has one of two scheduling modes that controls how the task is scheduled: **manual** (the default) or **automatically** scheduled.

- Think of a manually scheduled task as an initial placeholder you can create at any time without affecting the rest of the schedule.

- Task names should be recognizable and make sense to the people who will perform the tasks and to other stakeholders who will read the task names.

To enter task names
1. Click an empty cell in the Task Name column.
2. Enter your task names, and then press the Enter key after each one.

To insert a new task within a task list
1. Click in the Task Name column where you want to insert the new task.
2. On the Task tab, in the Insert group, click Task.
Project inserts a row for a new task and renumbers the subsequent tasks. Project
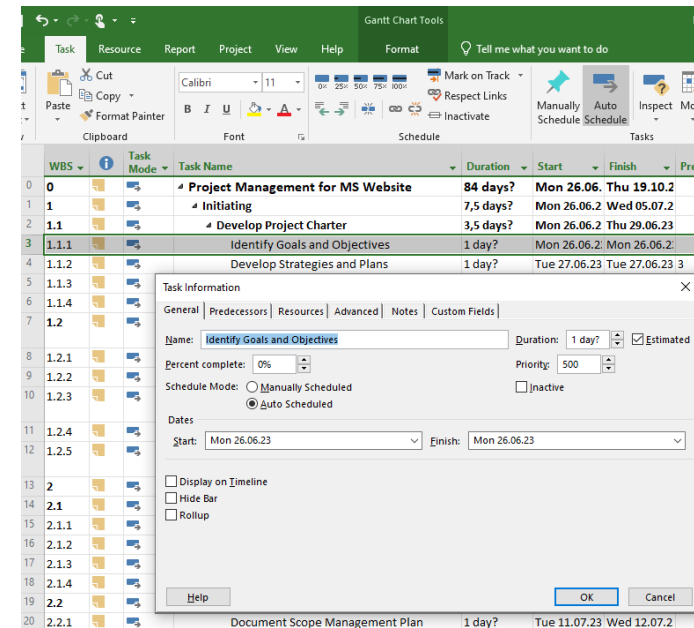names the new task <New Task>.
3. With <New Task> selected, enter the task name, and then press Enter.

To delete a task
1. Right-click the task name, and then click Delete Task.

Enter task durations and dates

- A task's duration represents the amount of time you expect it will take to complete the task. Project can work with task durations that range from minutes to months.

- Project uses standard values for minutes and hours for durations: 1 minute equals 60 seconds, and 1 hour equals 60 minutes.

- For the durations of days, weeks, and months, you can use Project's defaults (for example, 20 days per month) or define your own values in the Project Options dialog box.
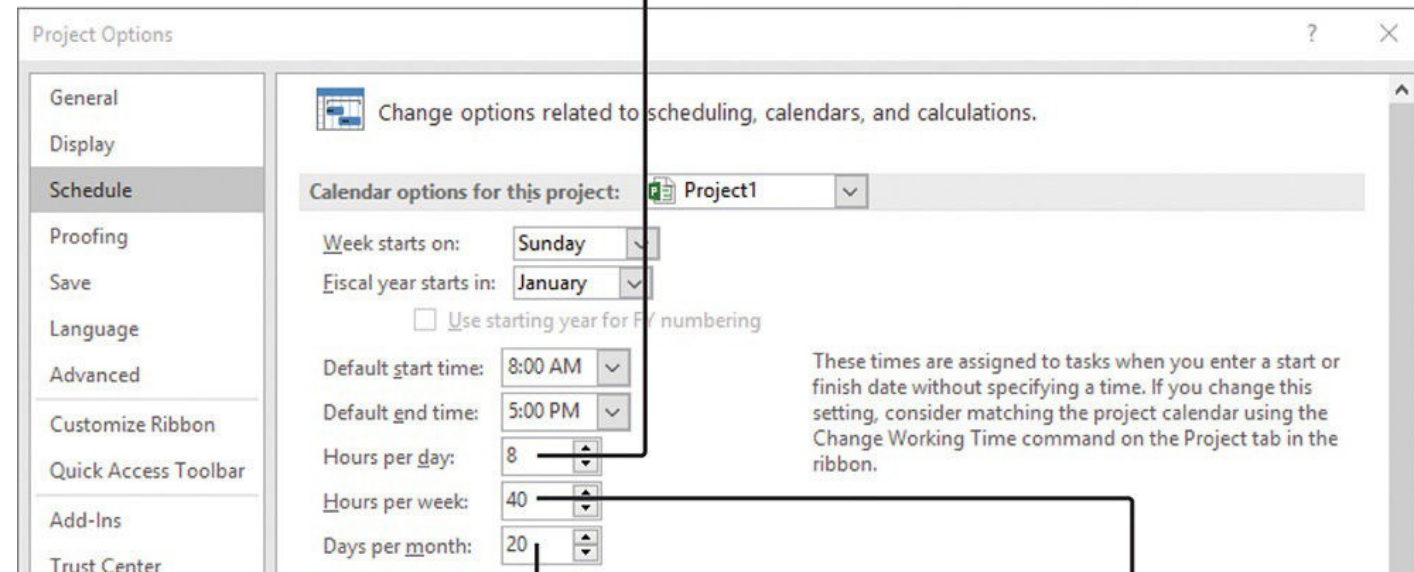
Enter task durations and dates

- Let's explore task durations with an example. Assume that a plan has a project calendar with working time defined as 8:00 A.M. through 5:00 P.M., with one hour off for lunch breaks, Monday through Friday, leaving nonworking time defined as evenings (after 5:00 P.M.) and weekends.

- If you estimate that a task will take 16 hours of working time, you could enter its duration as 2d to schedule work over two 8-hour workdays.

- You should then expect that starting the task at 8:00 A.M. on a Friday means that it will not be completed until 5:00 P.M. on the following Monday. No work would be scheduled over the weekend because Saturday and Sunday have been defined as nonworking time.

With a setting of 8 hours per day, entering a two-day task duration (2d) is the same as entering 16 hours (16h)

Project Options

Change options related to scheduling, calendars, and calculations.

General
Display
Schedule
Proofing
Save
Language
Advanced
Customize Ribbon
Quick Access Toolbar
Add-Ins
Trust Center

Calendar options for this project: Project1

Week starts on: Sunday
Fiscal year starts in: January
☐ Use starting year for FY numbering

Default start time: 8:00 AM
Default end time: 5:00 PM
Hours per day: 8
Hours per week: 40
Days per month: 20

These times are assigned to tasks when you enter a start or finish date without specifying a time. If you change this setting, consider matching the project calendar using the Change Working Time command on the Project tab in the ribbon.

With a setting of 20 days per month, entering a one-month task duration (1mo) is the same as entering 160 hours (8 hours per day x 20 days)

With a setting of 40 hours per week, entering a three-week task duration (3w) is the same as entering 120 hours (120h)

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Enter task durations and dates

- Project handles task scheduling in two ways.

- Automatically scheduled tasks always have a duration (one day by default).

- Manually scheduled tasks, however, do not initially have any duration. A task's duration is essential for Project to schedule a task, so it makes sense that a manually scheduled task, which is not scheduled by Project, does not require a duration.

- You can, however, enter placeholder duration values for manually scheduled tasks

If you enter this abbreviation	It appears like this	And it means
m (such as 30m)	30 mins	30 minutes
h (such as 6h)	6 hrs	6 hours
d (such as 4d)	4 days	4 days
w (such as 3w)	3 wks	3 weeks
mo (such as 2mo)	2 mons	2 months
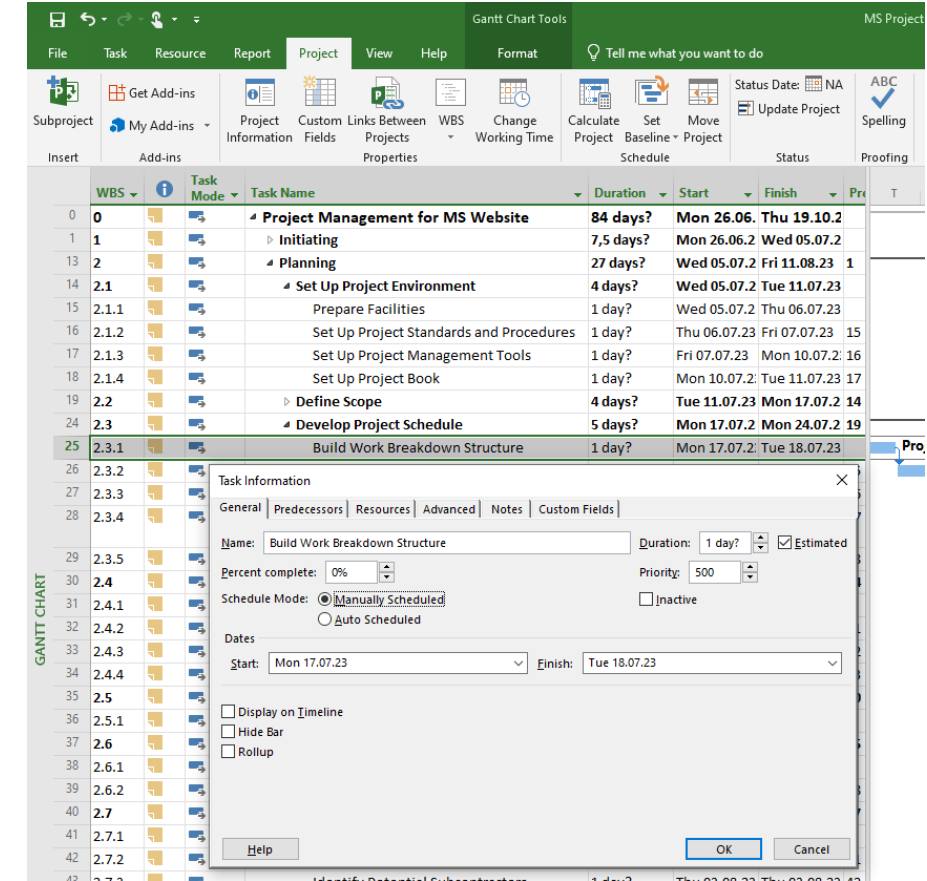
Enter task durations and dates

- When you create an automatically scheduled task, Project adds a question **mark (?)** after the one-day duration to indicate that the duration is an estimate.

- This is a handy reminder that you will need to determine the task's correct duration at some point.

- In fact, you can flag any task as having an estimated duration. Select the task, and on the Task tab, in the Properties group, click Information, and then select the Estimated check box.

- If needed, you can schedule tasks to occur during nonworking and working time. To do this, enter an **elapsed duration** to a task. You enter elapsed duration by preceding the duration abbreviation with an *e*.

For instance, a construction project might have the tasks Pour foundation concrete and Remove foundation forms. If so, you might also want a task called Wait for concrete to cure, because you don't want to remove the forms until the concrete has cured. The task Wait for concrete to cure should have an elapsed duration because the concrete will cure over a contiguous range of days, whether they are working or nonworking days. If the concrete takes 48 hours to cure, you can enter the duration for that task as 2ed, schedule the task to start on Friday at 9:00 A.M., and expect it to be complete by Sunday at 9:00 A.M

Enter task durations and dates

To enter task duration

1. Click a cell in the Duration column for a task.

2. Enter a duration value.

- Project initially sets all new tasks that have a duration value to start at the project start date. This is true whether the tasks are manually or automatically scheduled.

- For manually scheduled tasks, you can enter a duration as either a numeric value, such as 2d, or as placeholder text, such as Check with Marketing team. For any columns that are too narrow to display the full value, point to the cell; its full value will appear in a ScreenTip.

- For both manually and automatically scheduled tasks, Project draws a Gantt bar in the chart portion of a Gantt chart view. The length of the bar represents the task's duration.

Enter task durations and dates

Enter milestone tasks

- In addition to entering tasks to be completed, you might want to account for an important event for your project's plan, such as the end of a major phase of the project. To do this, you will create a milestone task.

- Milestones are significant events that are either reached within the plan (such as the completion of a phase of work) or imposed upon the plan (such as a deadline by which to apply for funding). Because the milestone itself doesn't normally include any work, milestones are normally represented as tasks with **zero** duration.

Link tasks to create dependencies

- When you link tasks, you create scheduling **relationships** between the tasks.

- These task relationships are called dependencies, as in the start of this task is dependent upon the completion of a prior task. When you create task dependencies (also called **links**), Project can automatically adjust the scheduling of linked tasks as changes occur in your plan.

- Creating dependencies by linking tasks is crucial to getting the full benefit of the Project scheduling engine.

These two tasks have a finish-to-start relationship, which has two aspects:

- The second task must occur after the first task; this is a *sequence*.
- The second task can occur only if the first task is completed; this is a *dependency*.
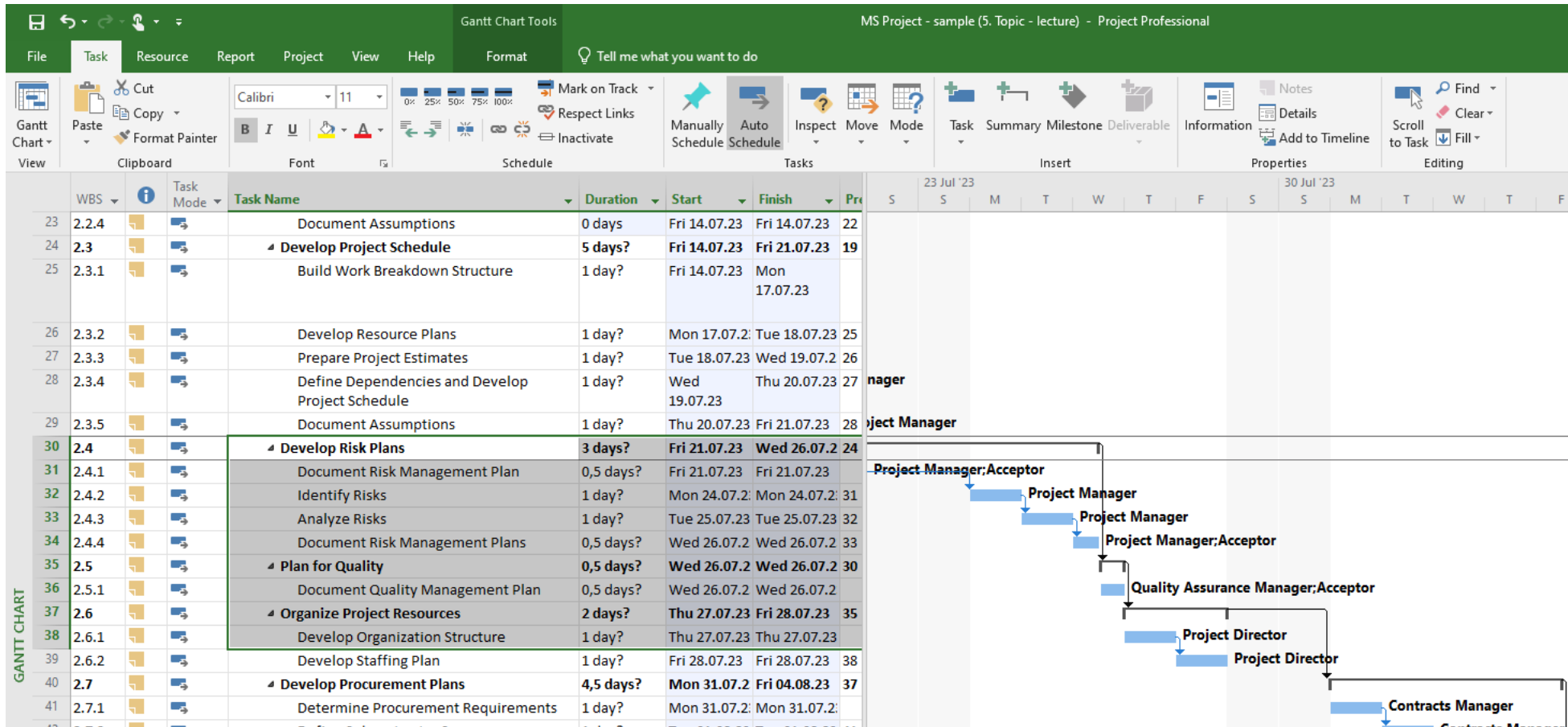
Enter task durations and dates

Link tasks to create dependencies

- Click View > Gantt Chart.

- Hold down Ctrl and click the two tasks you want to link (in the Task Name column).

- Click Task > Link the Selected Tasks Link Tasks button on the Task tab of the ribbon.
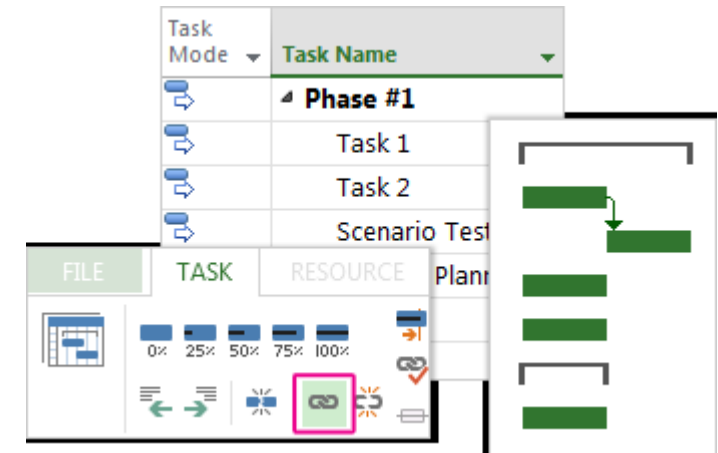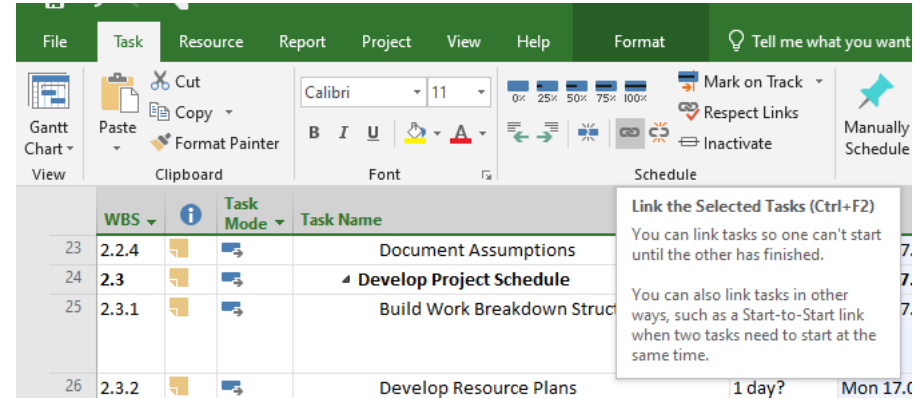
Gantt chart with tasks and durations – an example

Document task information

- You can record additional information about a task in a note.

- For example, you might have detailed descriptions of a task but want to keep the task's name succinct.

- You can add such details to a task note rather than to the task's name. That way, the information resides in the plan and can be easily viewed or printed.

- There are three types of notes: task notes, resource notes, and assignment notes.

Vevox questions

- The project manager is the key to successful project planning. It is desirable that the project manager be involved from project conception through execution.

- Project planning must be systematic, flexible enough to handle unique activities, disciplined through reviews and controls, and capable of accepting multifunctional inputs. Successful project managers realize that project planning is an iterative process and must be performed throughout the life of the project.

- One of the objectives of project planning is to completely define all work required (possibly through the development of a documented project plan) so that it will be readily identifiable to each project participant. This is a necessity in a project environment because:
  - If the task is well understood prior to being performed, much of the work can be preplanned.
  - If the task is not understood, then during the actual task execution more knowledge is gained that, in turn, leads to changes in resource allocations, schedules, and priorities.
  - The more uncertain the task, the greater the amount of information that must be processed in order to ensure effective performance.