Including: project setup cheat sheet

The 80/20 Guide to MS Project

A SUPER-PRACTICAL GUIDE THAT WILL HELP YOU CREATE CORRECT PROJECT PLANS, MASTER REAL LIFE SITUATIONS AND ALWAYS STAY IN CONTROL OF YOUR PROJECT

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Content

CHAPTER 1

Welcome

Hi there!

Thank you for choosing this e-book as your guide for learning Microsoft Project, the leading scheduling tool for serious project management.

I wrote this book as a practical guide for people who have to estimate and manage projects on a regular basis: project managers, independent contractors, operations managers and people in related positions.

My idea was to create both a quick start guide and a reference manual for looking up certain features if you are already a more advanced user. Project is quite complex! Therefore I tried to explain its usage in the easiest possible way, so that you can start quickly and have your first schedule set up within an hour. I hope you can follow my explanations and I'd love to hear your feedback on whether you liked (or didn't like) this book.

A few words about me: I'm Adrian Neumeyer, founder and CEO of Tactical Project Manager, a website providing practical tips and tools for people managing projects. I'm also a former IT project manager with over 10 years of experience managing large, global system implementations.

I wish you success at your work and useful insights from going through the book. If you run into a problem that you don't know how to solve in MS Project, you can email me at adrian@tacticalprojectmanager.com and I can give you some directions.

Best,

Adrian

CHAPTER 2

The Big Picture

Before we get into the actual usage of Project, I want to familiarize you with the general way how the tool works. MS Project is a computer-based scheduling tool. It takes your inputs – for example the desired project start date, effort estimations, availability of team members and other inputs – and automatically calculates a schedule based on your inputs.

MS Project uses the following input parameters. These are your 'levers'! They enable you to generate the schedule you want – with the correct dates.

Linking of tasks

You can specify in what order tasks should be performed. You can also link tasks that depend on each other.

Constraints

You can add constraints for tasks. For example: A specific task must be scheduled after 16 September, but not earlier.

Effort and availability of resources

Project aligns the schedule with the actual availability and workload of team members and other resources.

Calendars

Enter holidays and other absences of team members and Project will respect these in the scheduling.

Project dates

You can specify when a project should start. Or you can schedule backwards from a given finish date.

Automatic and manual scheduling

Although automatic scheduling is the way to go, you can schedule specific tasks manually for the dates you want.

Task types and effort-driven tasks

Can a task be finished earlier if you add more people to it? Or should the duration be fixed? These settings can be made on task level, and they are very important for scheduling.

CHAPTER 3

The User Interface

In this chapter, I'll explain the general structure of the screen of MS Project and the main views. We'll follow the 80/20 rule and look at those parts which you are going to use most of the time. For the other views (which MS Project has plenty of), you can easily discover them on a need basis.

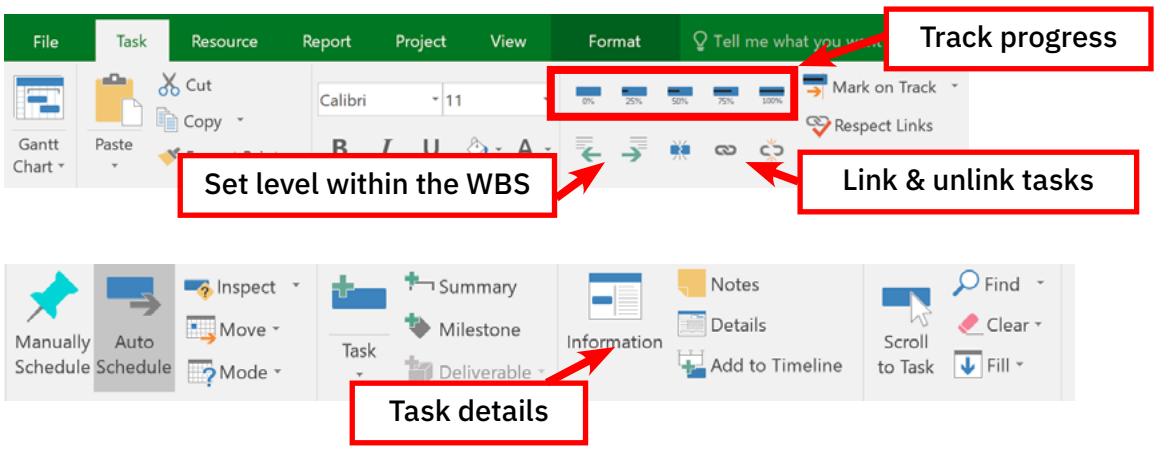
The first thing we will look at is the navigation bar, which you find at the top of the screen.

The navigation bar

The navigation bar is organized in different so-called "ribbons". Each ribbon contains tools to manage a specific aspect of the project.

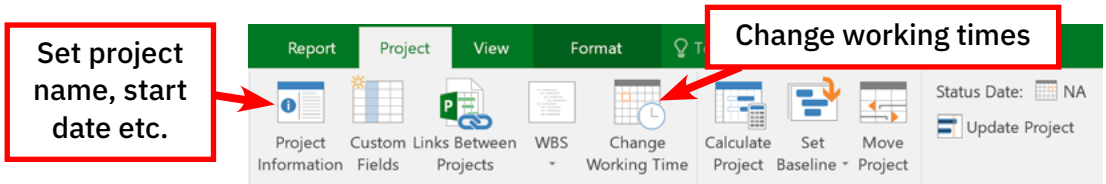
Task ribbon

Here are all the features you need to enter, update or track project tasks.



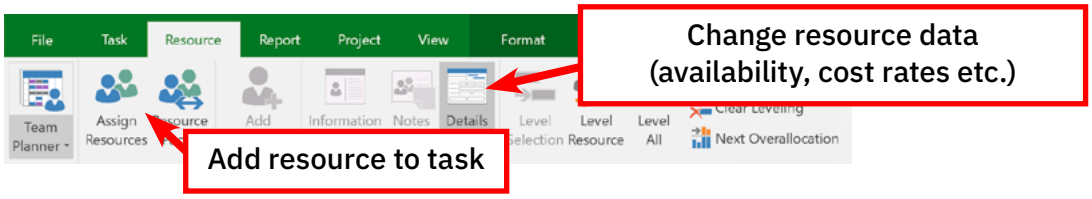
Project ribbon

Change settings for the entire project, such as project start dates, end dates or working times. You can also set baselines (snapshots) from here:



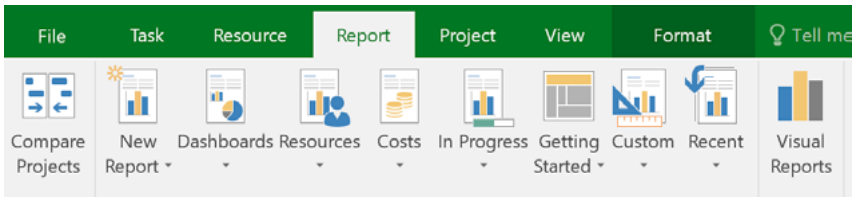
Resource ribbon

Enter and manage resources such as team members, equipment or materials from here:



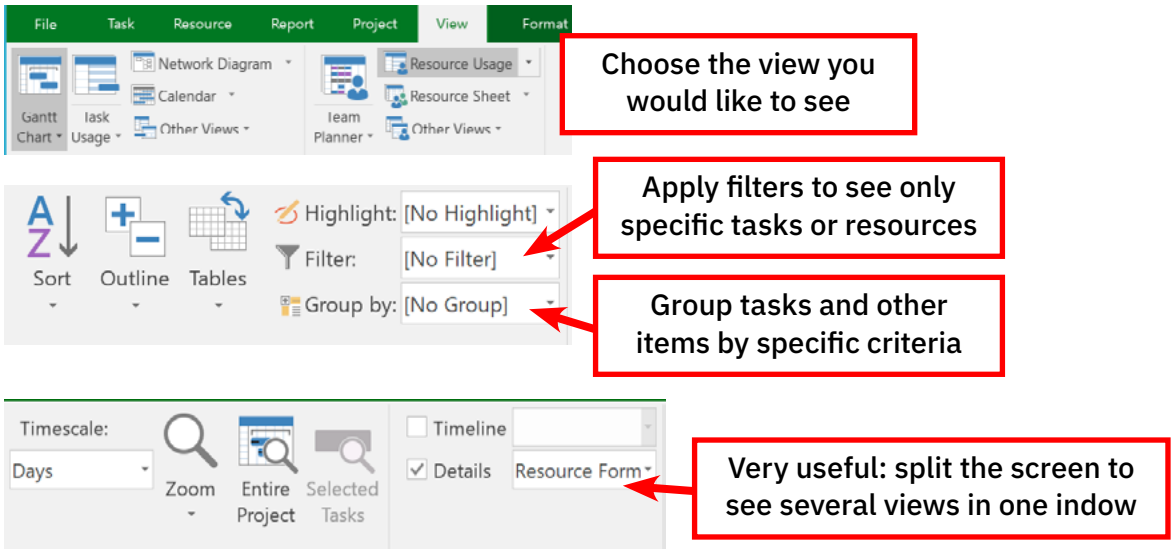
Report ribbon

Create cost, task or resource reports from here:



View ribbon

MS Project has many views which allow you to see or update certain elements of your project. Here you can switch between views and customize the screen for your needs:

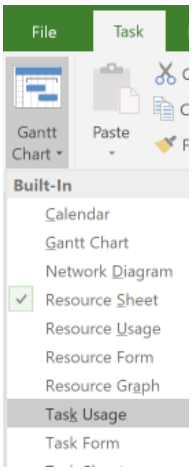


Now that we've looked at the menu, let's go through the most important views.

The most important views

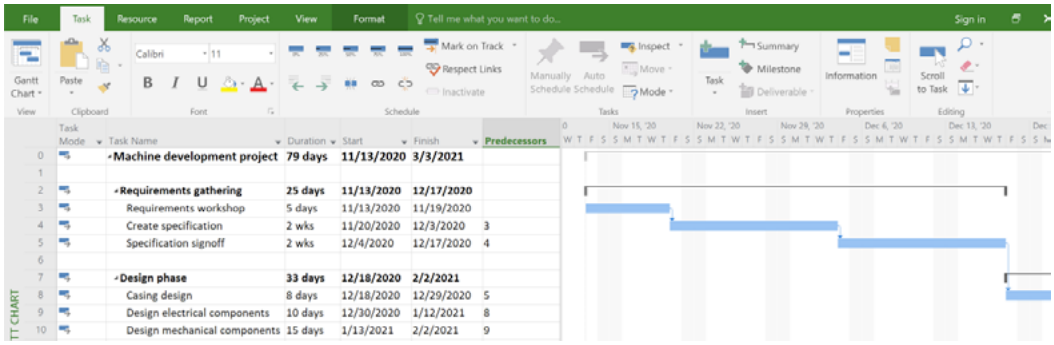
A view essentially gives you a perspective on certain elements of your project – such as costs, tasks or resources.

You can open the respective view with the following button on the left:



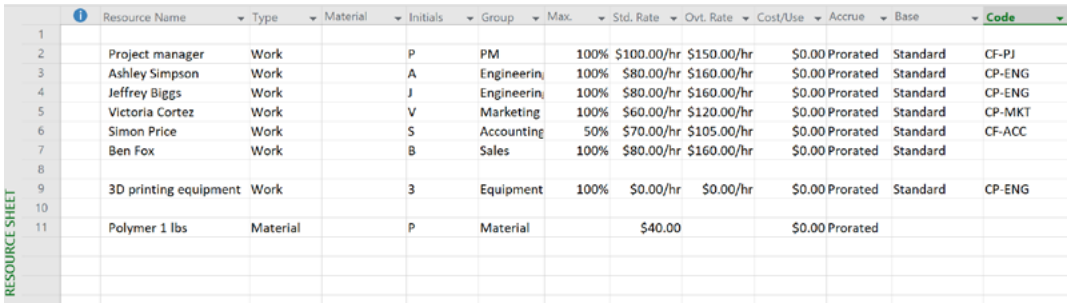
Gantt view

This is where you'll spend most of the time in. In the Gantt view, you add tasks, link them in the right order, maintain durations and fine-tune your plan using dependencies and constraints:



Resource sheet

If you want to let MS Project calculate the schedule on the basis of resources, you need to maintain any involved resources here, including their cost rates. Resources can be team members, machinery, materials and other cost resources (travel, legal fees etc.).

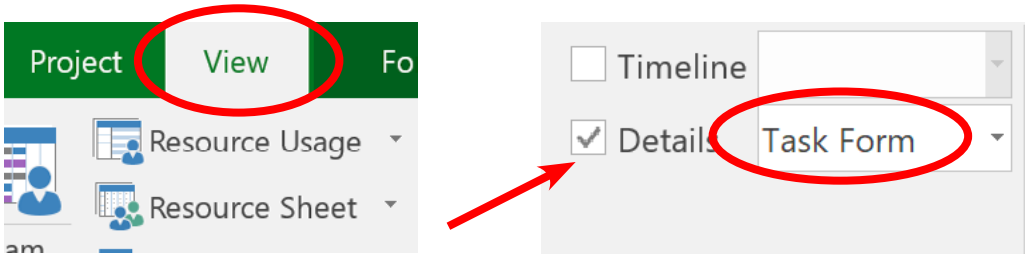


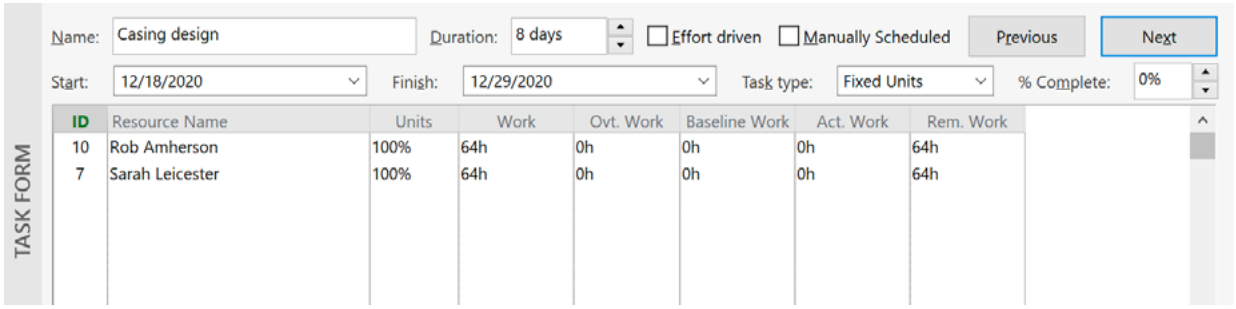
On page 47 I explain how the Resource Sheet is used.

Task Form

The Task Form is the easiest way where you can maintain resources assignments to tasks. Basically, who is going to work on a specific task and for how many hours.

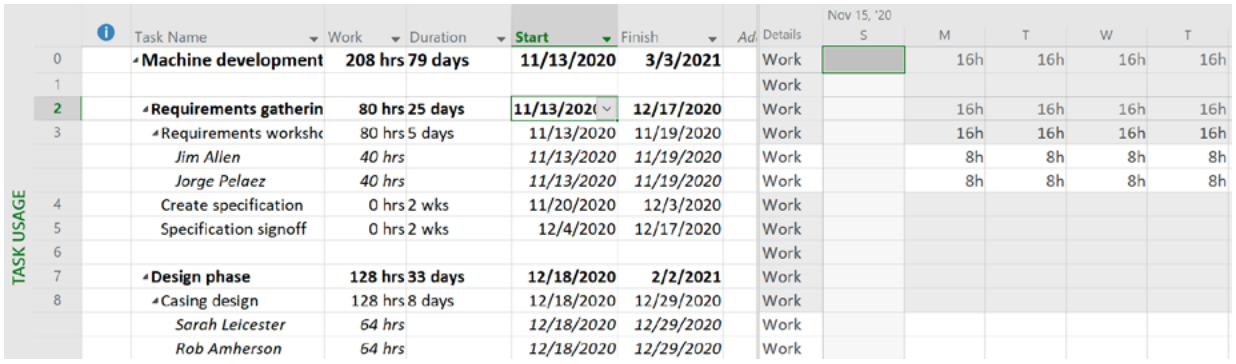
To show the Task Form, go to the View ribbon and select *Task Form* for the split view:





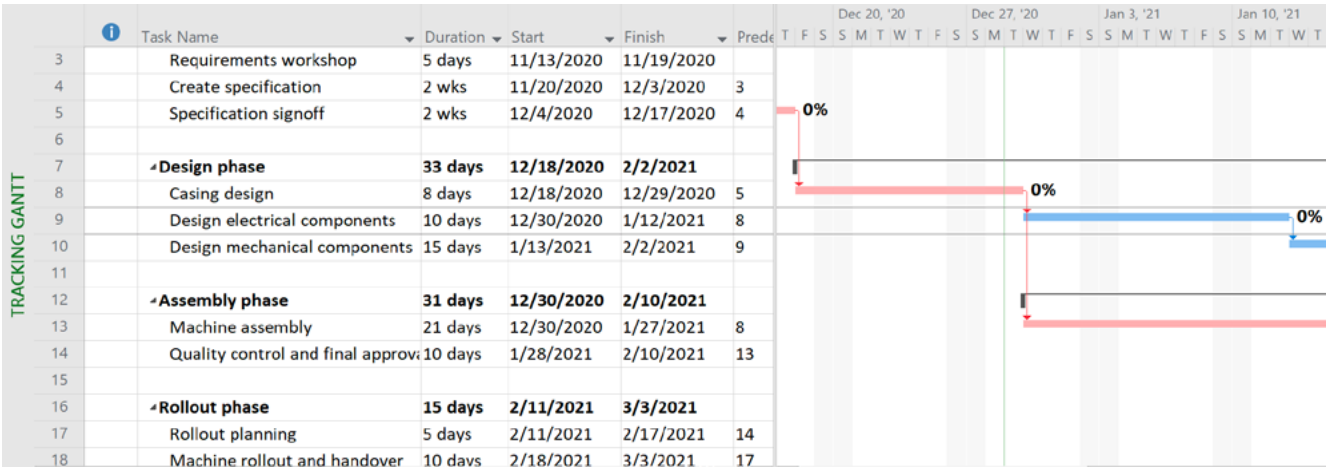
Task Usage

The Task Usage view is where you can see project tasks and the assigned resources assigned to each task. Use this view to change the distribution of work across the timeline. You can also track actual and remaining work for each resource here — in case you want to track at this detailed level.



Tracking Gantt

This is the place where you synch your plan with reality. Track actual work completed, maintain the true start and finish dates of tasks, and perform comparisons of baseline vs. actual or scheduled dates.



CHAPTER 4

Cheat sheet for setting up new projects

Below are the steps you have to take in MS Project when you are starting a new project. The detailed process (with screenshots) can be found on the mentioned page.

Note: You have some flexibility in the order of steps. Some people follow a slightly different sequence. Every approach has its pros and cons but the indicated sequence is a 'safe' one.

Project phase	Step	See page(s)
Project setup and planning	Create a new project file	15
	Set the project start date (or end date if you want to schedule backwards)	16
	Maintain calendars (For the project itself but also for team members)	30
	Enter the high-level task blocks as summary tasks	23
	Enter sub tasks / detail tasks (group them under summary tasks)	17
	Enter durations for each task	18
	Select task types for your tasks	57
	Maintain any dependencies *Stay away from setting dependencies for summary tasks!*	41
	Enter your effort (work) estimates *Column 'Work' in the Task Usage view*	62
	Maintain your team members as resources in the Resource Sheet	47
	Maintain resources for materials, travel and other cost items in the Resource Sheet	68
	Maintain a project budget in the Resource Sheet	64
	Assign resources to tasks	49

Project phase	Step	See page(s)
	Check task durations and Work estimates; make corrections if needed (remember that duration, work (effort) and resource units are linked – see page 52)	52
	Do a final check of your schedule	-
	Draw baseline	72
During the project	Track actual working hours and costs	80
	Factor in unplanned changes (change requests)	91
	Enter task delays	89
	Maintain actual start and finish dates of tasks	78
	Compare current schedule against baseline (initial schedule version)	101
	Create reports	93
Project closing	Create final cost and effort report	93

CHAPTER 5

Creating your first project schedule

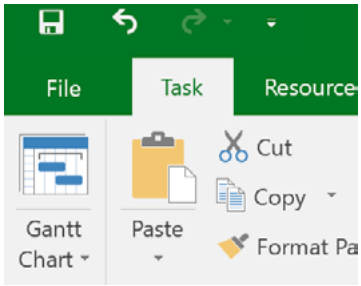
Without talking long about theory, I want you to get a quick feel of MS Project and how easy it is actually to use. Fire up MS Project and go through the following steps with me.

Some basic configuration before you start

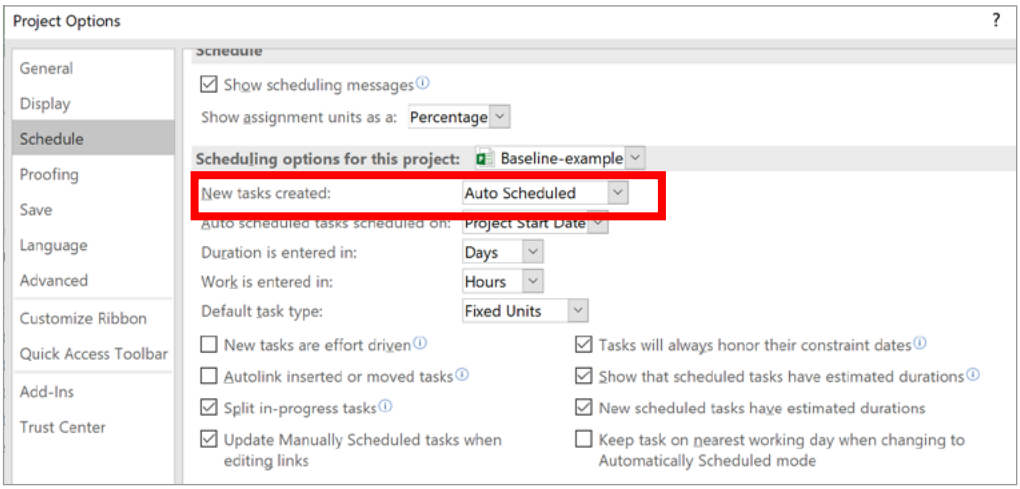
Before you create a schedule, you need to make two important changes in your settings:

Setting change 1: Make Auto Scheduling the default

Go to *File* → *Options*



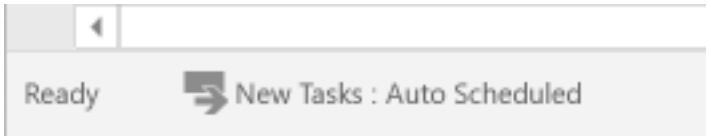
Make sure to set Auto Schedule for new tasks:



What does *Auto Scheduled* mean?

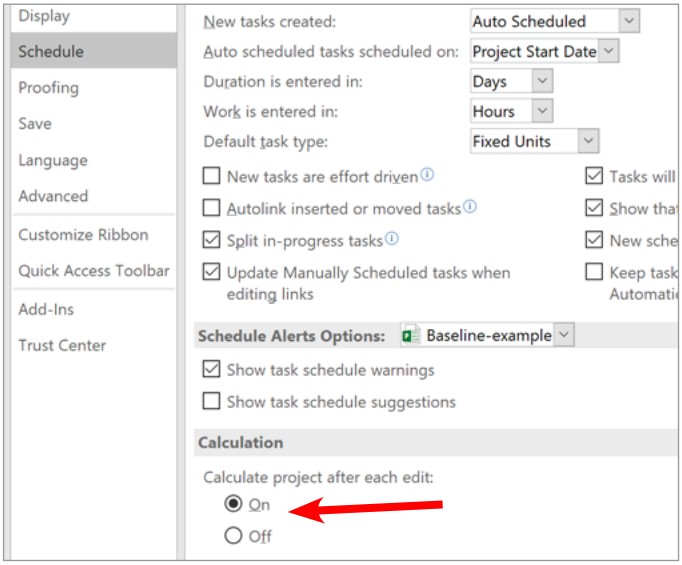
It means that new tasks will be scheduled automatically based on your project start date (or end date). More specifically, Project will determine the optimal start and end date for each task automatically, which is what we want (why would we use a computer-based scheduling tool if we would not want to automate the scheduling?)

Close the window. At the bottom left corner of the screen it should look like this:



Setting change 2: Enable immediate calculation

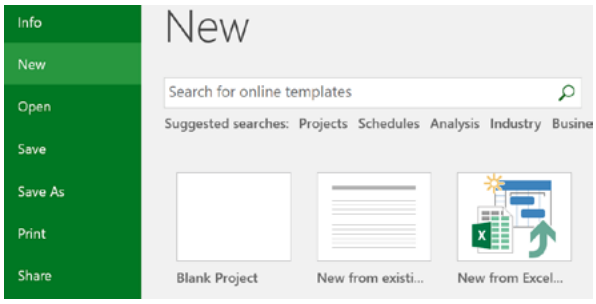
We want MS Project to re-calculate the project schedule immediately after we make a change. This ensures the data you see is always up to date. Unless you run a mega-project, leave the setting enabled.



Let's schedule a simple project

Our sample project: We are setting up our own business. We have picked a business idea and now we need to go from writing a business plan to a fully established business. For these steps, we are going to create a project plan.

Step 1: Create a new project



Choose *Blank Project*.

You will see a blank window.

First, let's create a **Project Summary Task**. This is like an overall "wrapper" task that contains our entire project.

Here's what you should see:

		Task Mode	Task Name	Duration	Start	Finish	Predecessors
0			Project4	0 days?	12/10/2020	12/10/2020	

Give your project a project name:

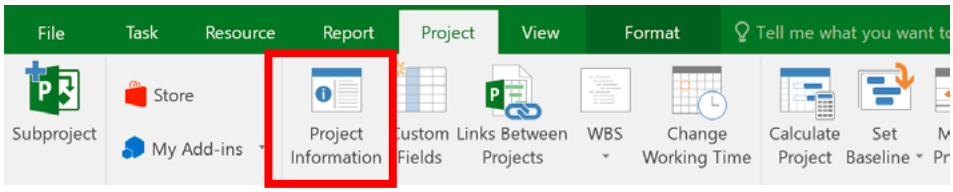
		Task Mode	Task Name	Duration	Start	Finish
0			Chocolate Store Project	0 days?	12/10/2020	12/10/2020

Don't worry about the duration and the dates – we'll take care of this later.

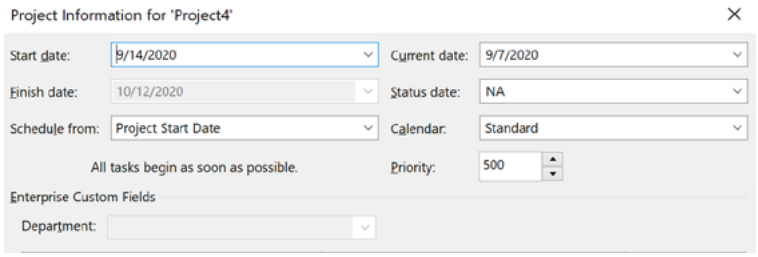
Step 2: Enter a project start date

You need to tell Project the date at which the project officially starts.

To set the project start date, open the Project tab and click *Project Information*:



Enter the project start date (in our example: 14th September 2020):



Note: You can decide whether you want MS Project to schedule your project *forward* from a specific start date or *backward* from a desired end date. If you already have committed to a golive date and want to know by when you need to begin work, then chose Schedule from *Project End Date* to trigger the backward planning. For this example, we want to base our schedule on a start date of 14th September 2020.

Schedule from Project Start Date → forward planning

Schedule from Project End Date → backward planning

Press OK after you've entered the project start date. You can see now the start date for our tasks is 14th September 2020.

Step 3: Enter the list of tasks

In this project, we need to accomplish the following tasks:

- Create business plan
- Get business license
- Set up bank account
- Get funding
- Pick a business location
- Set up office equipment and furniture
- Hire team
- Run promotion

If you look at the list, you notice that the tasks must be performed in a specific order. There are also some dependencies between the tasks.

For example, we can't get a bank account without having a business license. We also can't get funding (i.e. a bank loan) without having a business license. And of course we need the money to hire people for our store. So, everything is connected with each other.

Now let's enter those tasks into MS Project.

Enter the tasks into the table next to the Gantt view:

	Task Mode	Task Name	Duration	Start	Finish	Prede
1						
2						
3		Create business plan	1 day?	Mon 9/7/20	Mon 9/7/20	
4		Get business license	1 day?	Mon 9/7/20	Mon 9/7/20	
5		Set up bank account	1 day?	Mon 9/7/20	Mon 9/7/20	
6		Get funding	1 day?	Mon 9/7/20	Mon 9/7/20	
7		Pick a business location	1 day?	Mon 9/7/20	Mon 9/7/20	
8		Set up office equipment a	1 day?	Mon 9/7/20	Mon 9/7/20	
9		Hire team	1 day?	Mon 9/7/20	Mon 9/7/20	
10		Run promotion	1 day?	Mon 9/7/20	Mon 9/7/20	

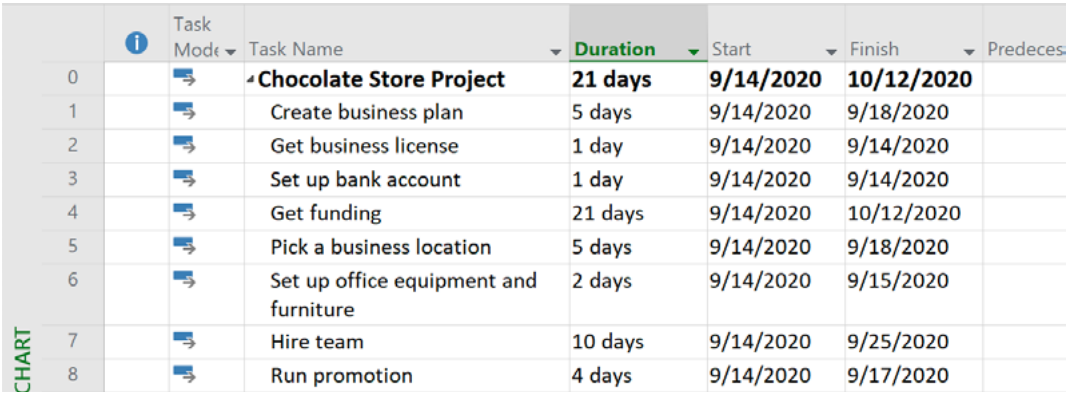
At this stage, Project doesn't have all the information it needs to create a schedule. It doesn't know how long each task is going to take. Therefore the *Duration* has a question mark and the start and finish dates aren't correct yet.

Let's continue. You now need to "link" all tasks in the right order and enter the estimated durations.

Step 4: Enter task durations

Now, tell Project how long each task is going to take. What you enter here is the duration of the task, which is not the same as the effort. Duration is the total timespan until a task is finished. Effort (in Project, effort is called Work) is the amount of actual working time.

Enter the estimated duration in the duration column. Tip: you can either use the up/down arrows to change the values or enter for example "3d" to specify 3 days or "2w for 2 weeks of duration.



	Task Mode	Task Name	Duration	Start	Finish	Predeces
0		**Chocolate Store Project**	**21 days**	**9/14/2020**	**10/12/2020**	
1		Create business plan	5 days	9/14/2020	9/18/2020	
2		Get business license	1 day	9/14/2020	9/14/2020	
3		Set up bank account	1 day	9/14/2020	9/14/2020	
4		Get funding	21 days	9/14/2020	10/12/2020	
5		Pick a business location	5 days	9/14/2020	9/18/2020	
6		Set up office equipment and furniture	2 days	9/14/2020	9/15/2020	
7		Hire team	10 days	9/14/2020	9/25/2020	
8		Run promotion	4 days	9/14/2020	9/17/2020	

A big "no no": Never change the start or finish date of tasks manually. If a date calculated by Project does not fit, you should apply appropriate constraints instead. Look at chapter Dependencies and constraints where I talk about constraints.

Here is the next step you need to do:

Step 5: Link tasks in the right sequence

As I mentioned before, tasks should be performed in a specific order. And we want to show this order in Project. Let's link the tasks one after each other.

There are two ways how you can link tasks:

- The first method is to enter for each task which other task should come before it. That is, by defining a "predecessor" .
- The second method is by using the "link" button from the MS Project menu

I'll show you both methods now.

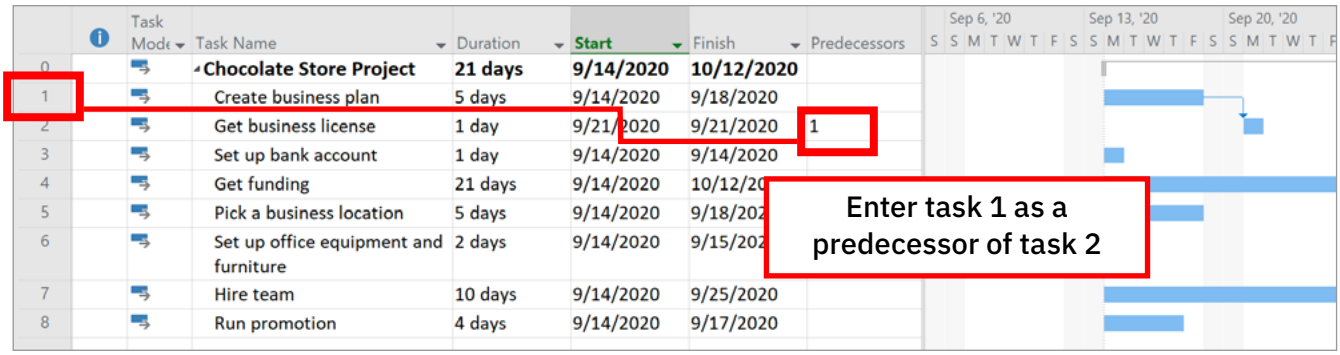
Let's look at the first two tasks: *Create business plan* and *Get business license*.

We could do both at the same time, since we don't necessarily have to have a business plan to apply for a license. But we want to focus on our business plan, get it done, and then work on the next task. So *getting a business license* should follow after *creating business plan*.

To tell MS Project that *getting business license* comes after *create business plan*, you can simply enter create business plan as a **predecessor** for task *Get business license* (in the *Predecessors* column).

The tasks are organized in a way similar to Excel using row numbers. These row numbers are used to identify tasks.

Do the following: In the predecessor column, enter "1" for task #2 (Get business license):



Watch the result: Task "Get business license" is now scheduled right after task "Create business plan" (look at the blue task bars).

Did you notice that your change immediately changed the Gantt chart on the right side? Also note that Project skipped the weekend because our calendar settings defined that there should be no work on weekends.

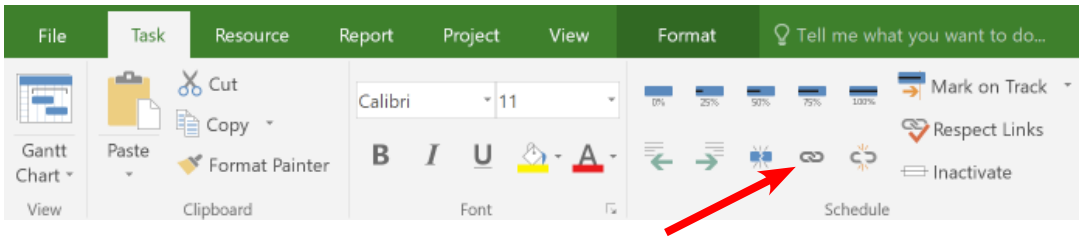
Next, we still have to arrange the other tasks in the right order. To do so, I now show you the

other way of linking dependent tasks. There is a shortcut in the menu.

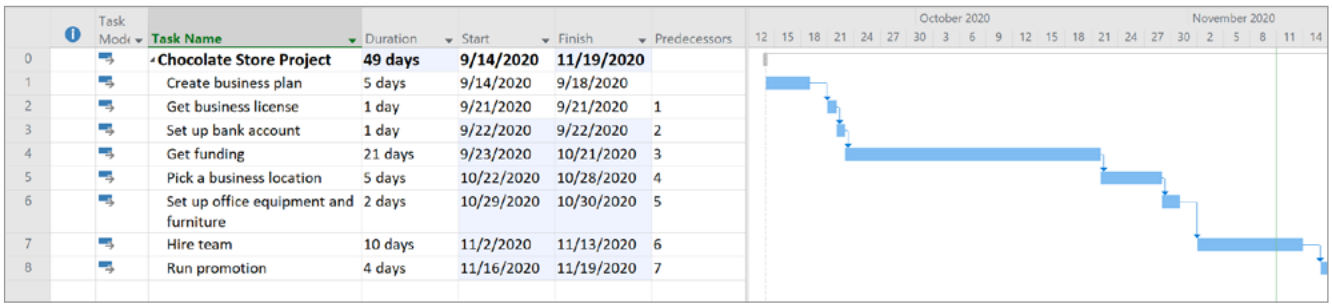
Select the remaining tasks in rows **2-8**, as I have done below:

	Task Mod	Task Name	Duration	Start	Finish	Predecessors
0		**Chocolate Store Project**	**21 days**	**9/14/2020**	**10/12/2020**	
1		Create business plan	5 days	9/14/2020	9/18/2020	
2		Get business license	1 day	9/21/2020	9/21/2020	1
3		Set up bank account	1 day	9/14/2020	9/14/2020	
4		Get funding	21 days	9/14/2020	10/12/2020	
5		Pick a business location	5 days	9/14/2020	9/18/2020	
6		Set up office equipment and furniture	2 days	9/14/2020	9/15/2020	
7		Hire team	10 days	9/14/2020	9/25/2020	
8		Run promotion	4 days	9/14/2020	9/17/2020	

From the *Task* tab press the **link button** (watch what happens to the Gantt chart!).

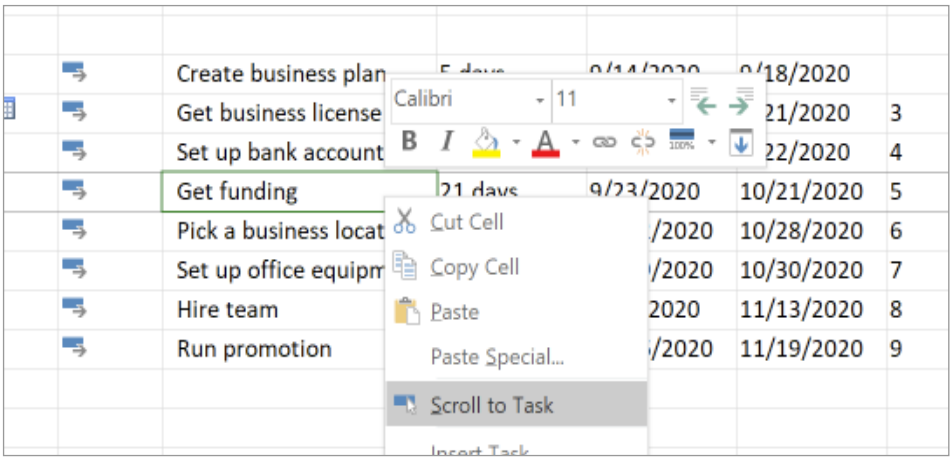


Our tasks are now arranged in the right order, and our Gantt chart is updated:



	Task Mod	Task Name	Duration	Start	Finish	Predecessors
0		**Chocolate Store Project**	**49 days**	**9/14/2020**	**11/19/2020**	
1		Create business plan	5 days	9/14/2020	9/18/2020	
2		Get business license	1 day	9/21/2020	9/21/2020	1
3		Set up bank account	1 day	9/22/2020	9/22/2020	2
4		Get funding	21 days	9/23/2020	10/21/2020	3
5		Pick a business location	5 days	10/22/2020	10/28/2020	4
6		Set up office equipment and furniture	2 days	10/29/2020	10/30/2020	5
7		Hire team	10 days	11/2/2020	11/13/2020	6
8		Run promotion	4 days	11/16/2020	11/19/2020	7

Pro tip: If you have a lot of tasks and you schedule is very wide and want to jump to the respective task in the Gantt view, just right-click on the task and choose Scroll to Task. This will pull up the corresponding task bar.

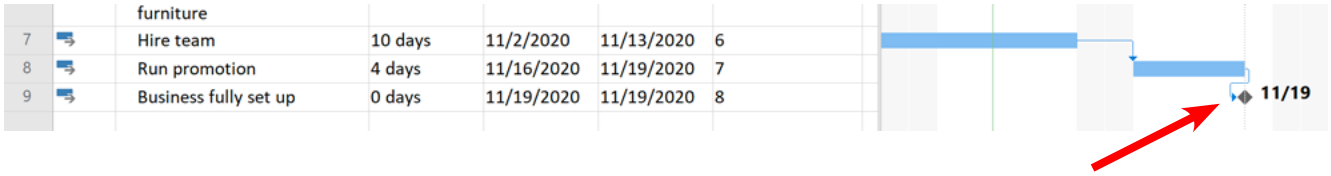


Step 6: Add a milestone to your schedule

In every project you have certain milestones you are working towards. Milestones are certain points in time where some goal must be achieved. For example, a document must be prepared or a component must be finished. We haven't included any milestone yet, so let's do that now.

To mark the point where we've fully set up our business, create a new milestone named 'Business fully set up'. **You create a milestone by changing a task's duration to zero** (zero days).

Milestones are shown as a grey diamonds:



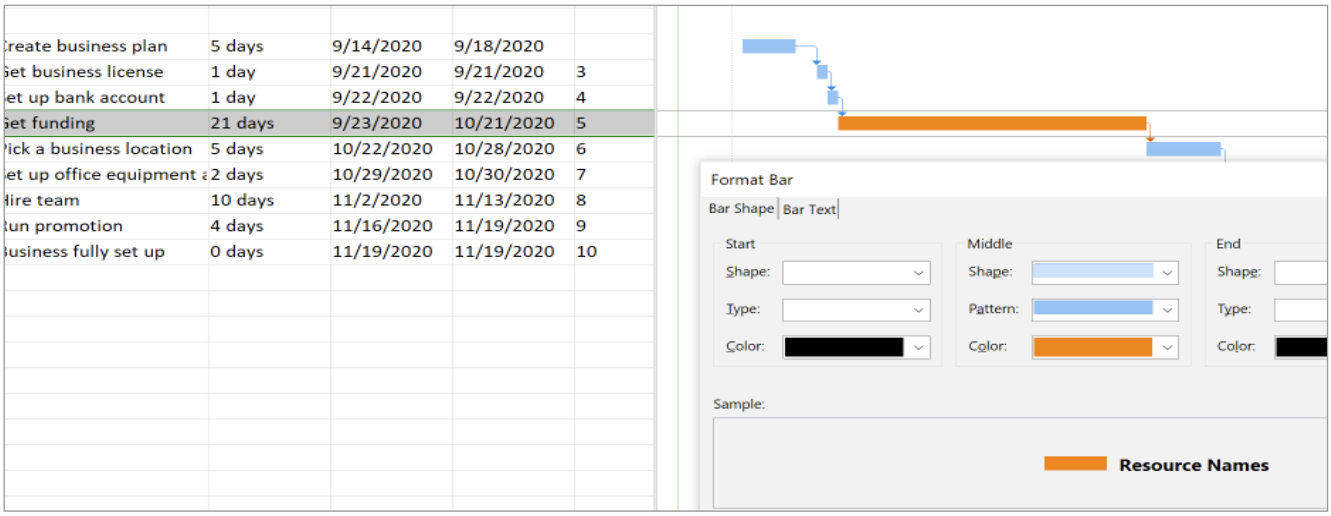
I didn't mention this before, but of course you need to schedule the "milestone task" right after the last regular task (Run promotion). For this, you need to enter a predecessor for the milestone task.

The milestone we entered also marks **the estimated finish date of the project**.

Excellent job! You have now created your first schedule in Project.

Tip: Making your schedule look nicer

Sometimes you may want to change the appearance of the Gantt chart, for example to make it more readable online or in print. One easy way is to change the color of the task bars. Just double click on task whose color you want to change and select the desired color. For example, you can visually group tasks by using different colors.



Using summary tasks to structure your schedule

Summary tasks make it easier to handle a larger amount tasks that belong together. Suppose there are 10 steps required to do the roofing of a building, we can group these 10 steps under one summary task called “Roofing”.

These summary tasks correspond to what’s called **work packages**.

Summary tasks in Project look like this:

GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1						
2		**Summary task 1**	**15 days**	**11/11/2020**	**12/1/2020**	
3		Task	1 day	11/11/2020	11/11/2020	
4		Task	7 days	11/12/2020	11/20/2020	3
5		Task	3 days	11/23/2020	11/25/2020	4
6		Task	4 days	11/26/2020	12/1/2020	5
7						
8		**Summary task 2**	**9 days**	**11/23/2020**	**12/3/2020**	
9		Task	1 day	11/23/2020	11/23/2020	4
10		Task	2 days	11/24/2020	11/25/2020	9
11		Task	6 days	11/26/2020	12/3/2020	10
12						
13		**Summary task 3**	**14 days**	**12/4/2020**	**12/23/2020**	
14		Task	7 days	12/4/2020	12/14/2020	11
15		Task	4 days	12/15/2020	12/18/2020	14
16		Task	2 days	12/21/2020	12/22/2020	15
17		Task	1 day	12/23/2020	12/23/2020	16
18						
19		**Summary task 4**	**10.5 days**	**12/24/2020**	**1/7/2021**	
20		Task	3 days	12/24/2020	12/28/2020	17
21		Task	2 days	12/29/2020	12/30/2020	20
22		Task	5 days	12/31/2020	1/6/2021	21
23		Task	0.5 days	1/7/2021	1/7/2021	22

You can also have further summary tasks below one summary task.

Let’s create a schedule that uses summary tasks.

Creating a schedule with summary tasks

Our first schedule example was very simple – it had only 8 task and one milestone.

In the next example we will create a more detailed structure.

Create a new project in the same way you did in our first example (see page 15).

Start by showing the **project summary task** and giving your project a name. Then, enter the tasks as shown in the image:

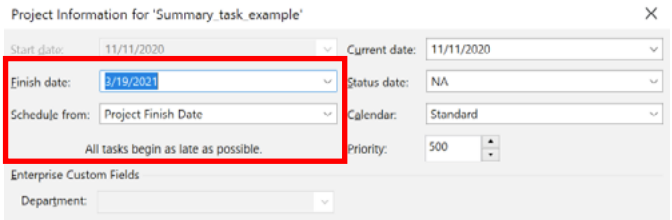
	Task Mode	Task Name	Duration	Start	Finish	Predecessors
0		**Idaho Builders Association 2020 conference**	**60 days?**	**12/28/2020**	**3/19/2021**	
1						
2		Find conference location	1 day?	3/19/2021	3/19/2021	
3		Find 5 suitable locations	3 days	12/28/2020	12/30/2020	
4		Visit locations	10 days	12/28/2020	1/8/2021	
5		Sign rental agreement	2 days	12/28/2020	12/29/2020	
6		Equipment and furniture setup	5 days	12/28/2020	1/1/2021	
7						
8		Conference marketing	1 day?	3/19/2021	3/19/2021	
9		Prepare announcement	5 days	12/28/2020	1/1/2021	
10		Set up Twitter and Facebook pages	3 days	12/28/2020	12/30/2020	
11		Share announcement on social media	12 wks	12/28/2020	3/19/2021	
12						
13		Registration handling	1 day?	3/19/2021	3/19/2021	
14		Set up registration database	4 days	12/28/2020	12/31/2020	
15		Accept registrations	12 wks	12/28/2020	3/19/2021	

Make sure you also enter the **durations**.

As you probably guessed, in this project we are organizing a conference

The conference is scheduled to start on 22th of March 2021. What does this mean for you? It means you should **schedule this project backwards**, with Friday 19 March 2021 as the intended project finish date (that's the last working day before the conference opening).

Go to *Project* → *Project Information* and set the project finish date as 19th of March 2021:

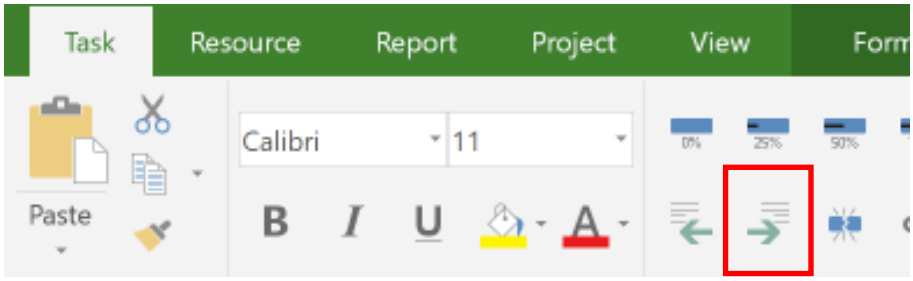


The project is now scheduled backwards.

Create the summary task structure

Next, we want to group the tasks together. As you can see, there are 3 main work packages, and the first row of each work package summarizes what we are doing. To group the tasks in the way shown, select the tasks belonging to each work package and press the Indent button.

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
0		**Idaho Builders Association 2020 conference**	**60 days**	**12/28/2020**	**3/19/2021**	
1						
2		**Find conference location**	**10 days**	**12/28/2020**	**1/8/2021**	
3		Find 5 suitable locations	3 days	12/28/2020	12/30/2020	
4		Visit locations	10 days	12/28/2020	1/8/2021	
5		Sign rental agreement	2 days	12/28/2020	12/29/2020	
6		Equipment and furniture setup	5 days	12/28/2020	1/1/2021	
7						
8		**Conference marketing**	**60 days**	**12/28/2020**	**3/19/2021**	
9		Prepare announcement	5 days	12/28/2020	1/1/2021	
10		Set up Twitter and Facebook pages	3 days	12/28/2020	12/30/2020	
11		Share announcement on social media	12 wks	12/28/2020	3/19/2021	
12						
13		**Registration handling**	**60 days**	**12/28/2020**	**3/19/2021**	
14		Set up registration database	4 days	12/28/2020	12/31/2020	
15		Accept registrations	12 wks	12/28/2020	3/19/2021	

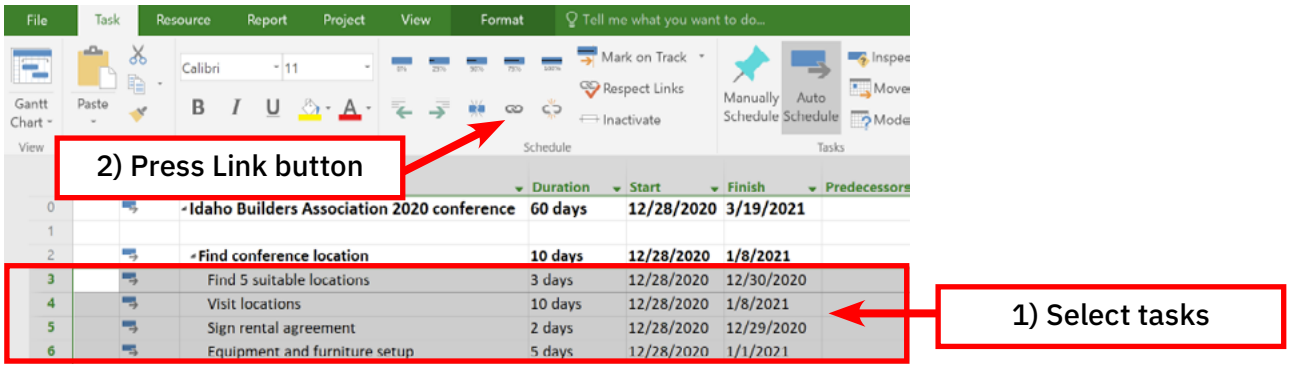


Do this for all three task groups and watch how the summary task title (e.g. “Registration handling”) becomes **bold**.

Link the tasks in the right order

Currently the tasks are running in parallel, which doesn’t make sense. We need to bring them into the right order, one after the other.

To link the tasks, select the task of each work package and press the link button.



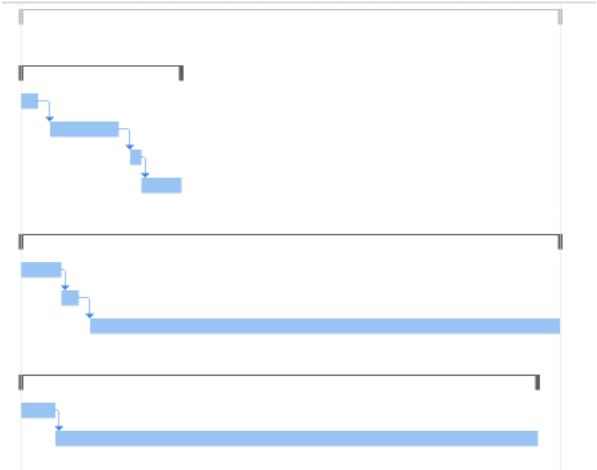
Repeat this step for all three work packages (task groups) and make sure you always leave out the summary task.

Your task list should now look like this:

	Task Name	Duration	Start	Finish	Predecessors
0	**Idaho Builders Association 2021 conference**	**68 days**	**12/16/2020**	**3/19/2021**	
1					
2	**Find conference location**	**20 days**	**12/16/2020**	**1/12/2021**	
3	Find 5 suitable locations	3 days	12/16/2020	12/18/2020	
4	Visit locations	10 days	12/21/2020	1/1/2021	3
5	Sign rental agreement	2 days	1/4/2021	1/5/2021	4
6	Equipment and furniture setup	5 days	1/6/2021	1/12/2021	5
7					
8	**Conference marketing**	**68 days**	**12/16/2020**	**3/19/2021**	
9	Prepare announcement	5 days	12/16/2020	12/22/2020	
10	Set up Twitter and Facebook pages	3 days	12/23/2020	12/25/2020	9
11	Share announcement on social media	12 wks	12/28/2020	3/19/2021	10
12					
13	**Registration handling**	**64 days**	**12/16/2020**	**3/15/2021**	
14	Set up registration database	4 days	12/16/2020	12/21/2020	
15	Accept registrations	12 wks	12/22/2020	3/15/2021	14

As you can see, Project has now put in the predecessor tasks in the Predecessor column. (For example, the task 5, “sign rental agreement” has task 4 (“Visit locations”) as predecessor, because you first have to visit the various locations in order to choose a specific conference venue.)

Now the tasks *within* each work package are in sequence, but the three work packages are still running in parallel. We need to change that. How can we bring the work packages – the location setup, the conference marketing and the registration handling – into the right order? Currently, the Gantt charts looks like this:



Let's think for a moment how we want to schedule the three work packages:

1. Conference marketing can only begin after we have chosen a conference location and signed the rental agreement. That means the first marketing task, "Prepare announcement", can only begin after task 5, "Sign rental agreement", is completed.

2. For the registration handling: We can set up the database as early as possible (right from the beginning of the project). In case we run into technical problems, we thereby have enough buffer to fix things before we take registrations. Registrations will be accepted over a fixed period of 12 weeks, counting backwards from the project finish date (19th of March 2021).

Let's see how to implement those two scenarios in Project.

For the 1st scheduling requirement:

	Task Name	Duration	Start	Finish	Predecessors
0	**Idaho Builders Association 2021 conference**	**83 days**	**11/25/2020**	**3/19/2021**	
1					
2	**Find conference location**	**20 days**	**11/25/2020**	**12/22/2020**	
3	Find 5 suitable locations				
4	Visit locations				3
5	Sign rental agreement				4
6	Equipment and furniture setup	5 days	12/16/2020	12/22/2020	5
7					
8	**Conference marketing**	**83 days**	**11/25/2020**	**3/19/2021**	
9	Prepare announcement	5 days	12/16/2020	12/22/2020	5
10	Set up Twitter and Facebook pages	3 days	12/23/2020	12/25/2020	9
11	Share announcement on social media	12 wks	12/28/2020	3/19/2021	10
12					
13	**Registration handling**	**64 days**	**11/25/2020**	**2/22/2021**	
14	Set up registration database	4 days	11/25/2020	11/30/2020	
15	Accept registrations	12 wks	12/1/2020	2/22/2021	14

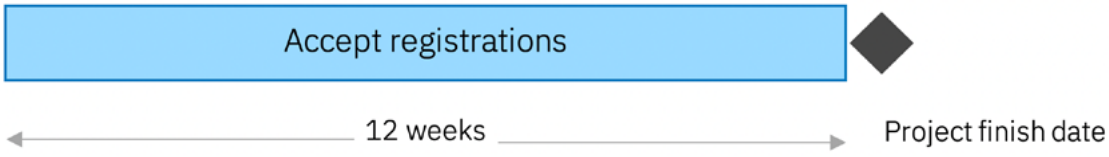
Schedule task „Prepare announcement" right after "Sign rental agreement"

For the 2nd scheduling requirement:

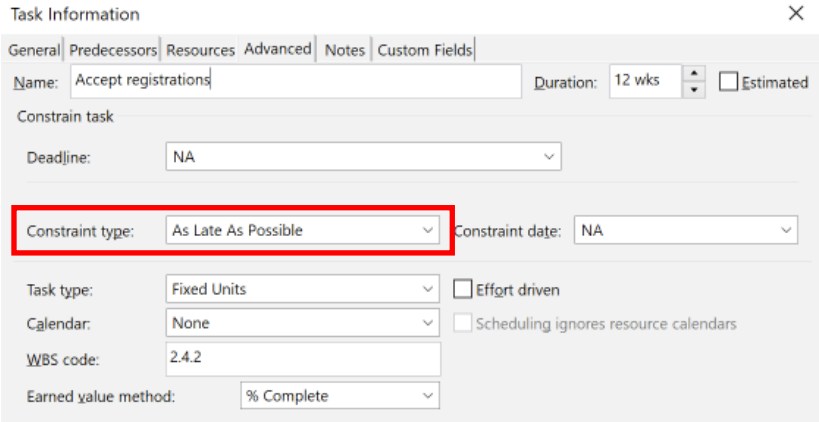
Task "Set up registration database" is already automatically scheduled to start at the earliest possible date, so we don't need to change anything:

13	**Registration handling**	**64 days**	**11/25/2020**	**2/22/2021**	
14	Set up registration database	4 days	11/25/2020	11/30/2020	
15	Accept registrations	12 wks	12/1/2020	2/22/2021	14

For the task “Accept registrations” we want to schedule it **as late as possible**, so that we have 12 weeks before the conference opening where people can sign up.



How can we schedule a task “as late as possible”? Very easy. Just double-click on task “Accept registrations” and set a constraint “As Late As Possible”:



In chapter Dependencies and constraints you’ll learn more about constraints and dependencies, which allow you to add work and time-related restrictions in your schedule.

See what has happened: Accept registrations is now moved to the end of the schedule:

13	**Registration handling**	**83 days**	**11/25/2020**	**3/19/2021**	
14	Set up registration database	4 days	11/25/2020	11/30/2020	
15	Accept registrations	12 wks	12/28/2020	3/19/2021	14

(It ends on 19th March 2021, which is the planned project finish date)

When should you start your project?

You have now scheduled your second project. In this case, we scheduled backward from a given finish date. Thanks to Project, you now know when you need to start the project. For the last example, you should start work on 25th November 2020.

Also, notice that Project has determined the start and finish date for every task. You can communicate this information to you team members who are going to do the actual work.

Sidenote: Grouping tasks by using summary tasks is a great way to structure your schedule. You are not limited to one sub-level. **You can create as many sub-levels with summary tasks as you like.** Just use the Indent button I showed you earlier.

CHAPTER 6

Working with calendars

When you schedule a project, the availability of team members and other resources is always a challenge. You can't schedule work at any time you want, but you have to see when your resources are available.

This is where the calendar settings of Project come into play. You can maintain different calendars – for the entire project but also for specific tasks or resources.

Calendar settings allow you to manage scenarios like these:

- Jim works from Monday – Thursday. You can't schedule any of his work on Fridays.
- Andrea works part time, Monday - Wednesday from 8:00am - 12:00pm and Thursday- Friday from 9:00am – 2:00pm.
- Maintenance work for the IT system should take place on the weekend.
- Your team in Canada can't work on the 1st of July, which is a national holiday.

These are just examples of constraints you have to deal with in the real world. Project makes it easy for you to incorporate such constraints into your schedule so that work only takes place when it's possible.

The 3 levels where calendars can be used

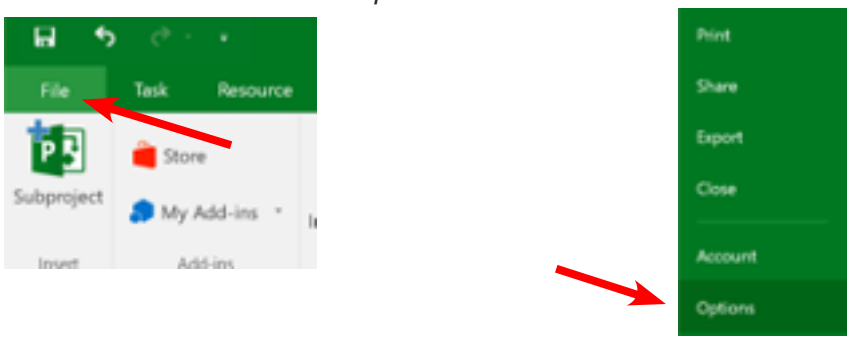
With MS Project, you are not restricted to using just one calendar or one specific set of working times. You can set different working days and working times on different levels of your project:

- **on project level:** You can define one standard calendar that is used as the default for the overall project.
- **on task level:** Specific tasks can be scheduled according to alternative calendars or working times. For example, you can schedule specific tasks on the weekend.
- **on resource level:** Specific people or resources in general can be set to work according to different working days and working times.

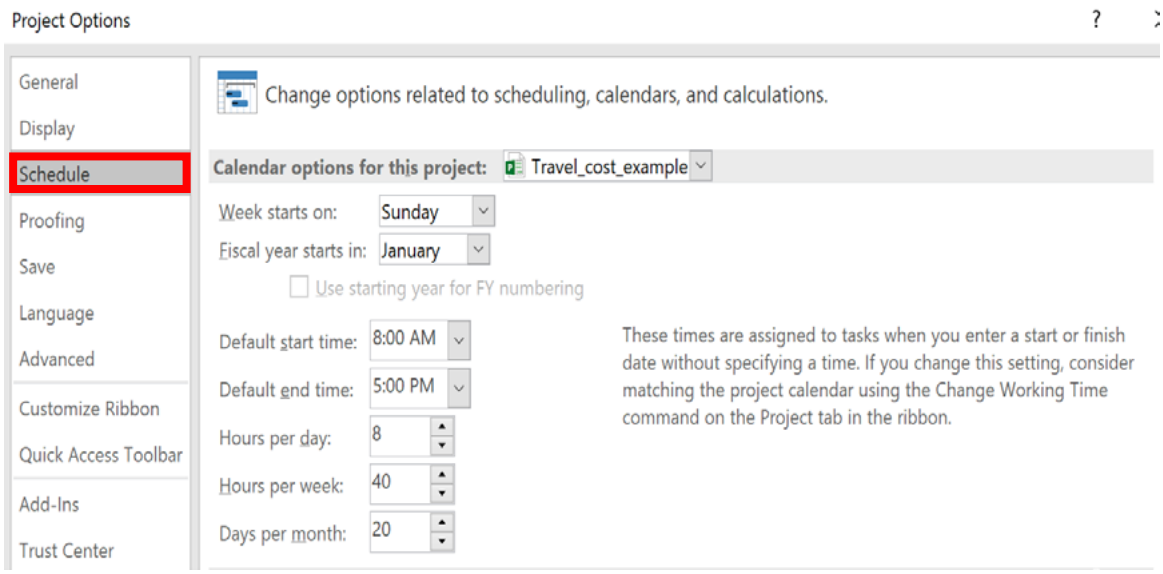
Default working times in MS Project

MS Project keeps its scheduling default settings in the program options. These default values are used whenever you create a new task. You can edit these settings here:

In the menu click *File* → *Options*:



In my case it looks like this. Here you can maintain working times and hours as well as other basic scheduling parameters.

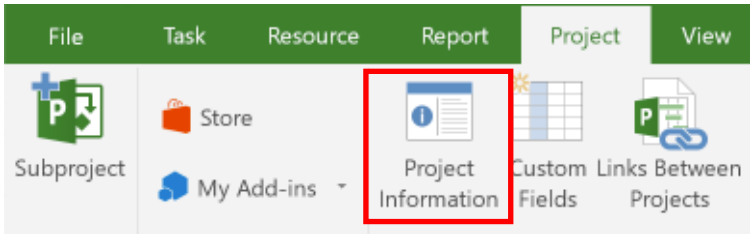


Changing the calendar and working times for your needs

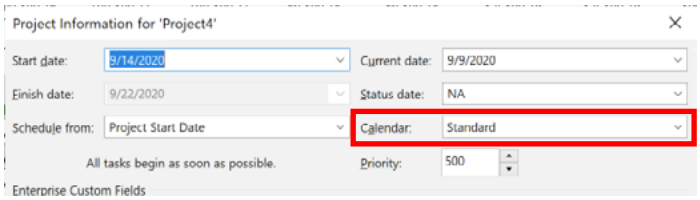
You can select which calendar you want to use for the project as a whole.

This is helpful for example when you are doing the same type of project in different countries. You create a separate calendar for each country in which you include the national holidays, local vacation periods and working times. Then you just copy the schedule for each country project and reschedule your tasks on the basis of the local calendar.

To choose the calendar for the project, go to *Project Information*:

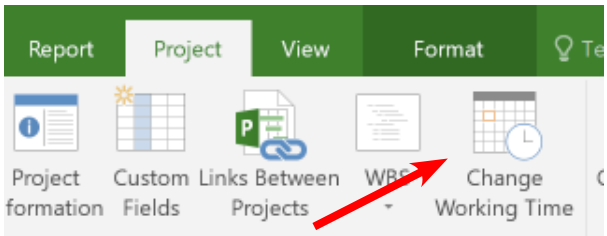


The default calendar (also called “base calendar”) is the “Standard” calendar. In this calendar, working times are weekdays from 8:00am – 5:00pm with a 1-hour lunch break.

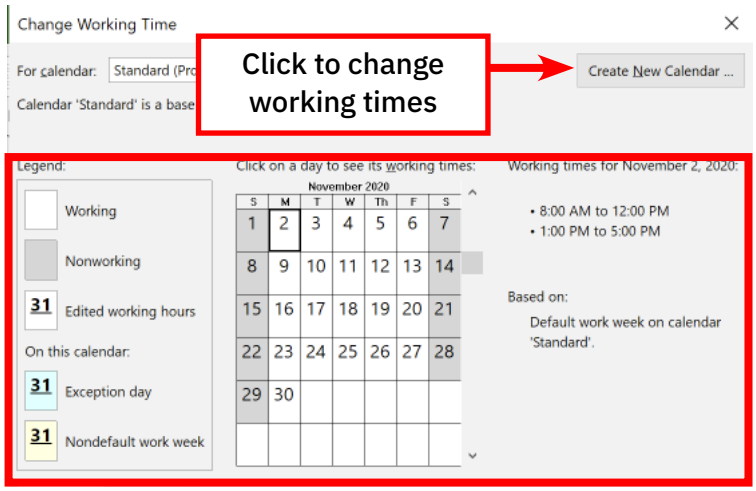


Now, how can you change the working hours or working days for your project?

Go to the Project ribbon and click *Change Working Time*:



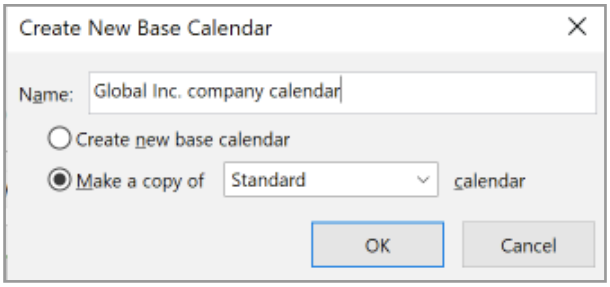
In the following window you can see the working times set for your project:



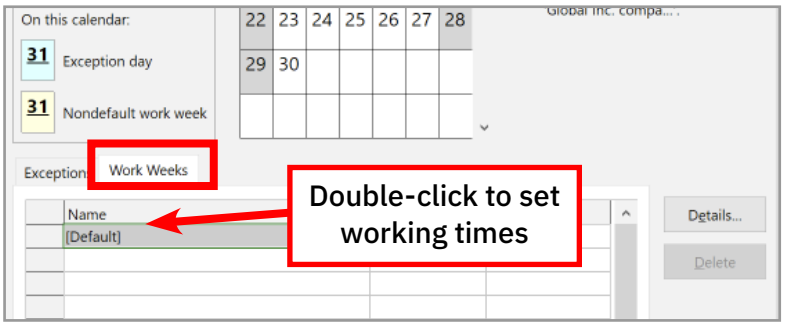
To change working times, click *Create New Calendar*.

Let's assume that in your company, working hours are 9:00am – 12:00pm and 12:30pm – 5:00pm. Let's change your project calendar accordingly.

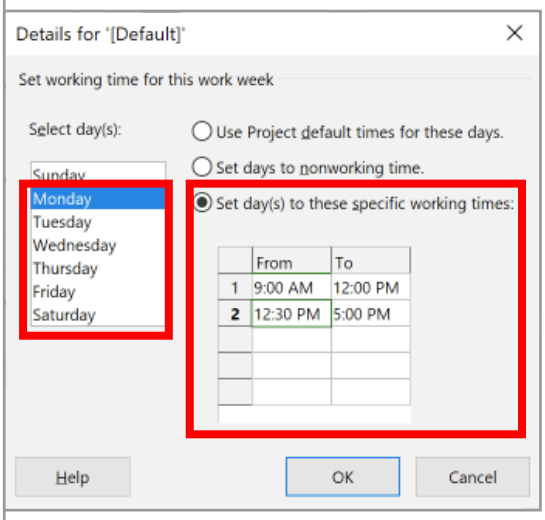
Enter a name for the new calendar and press OK:



Back in the working times window, select the *Work Weeks* tab to edit the working times. Then, double-click on the first row:



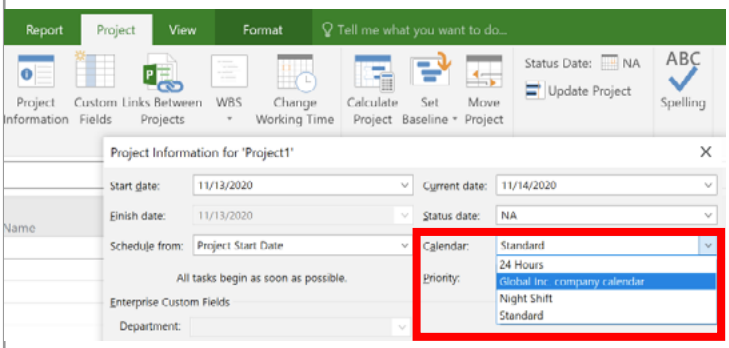
In the following window, **change the working times for every weekday to the new working times**:



Press OK.

Now you have created a new project calendar with the working times you need. As a final step, you need to tell Project that the new calendar should be used for your project.

To make the new calendar the default for your project, go back to the Project Information window and select the new calendar you just created:



Your project is now going to be scheduled based on the newly created calendar. However, you can still set different working times for specific tasks or people. The process is the same, meaning you create a separate calendar with specific working times and assign that calendar to the tasks or resources that should work based on that special calendar.

I'll show you an example in the next section.

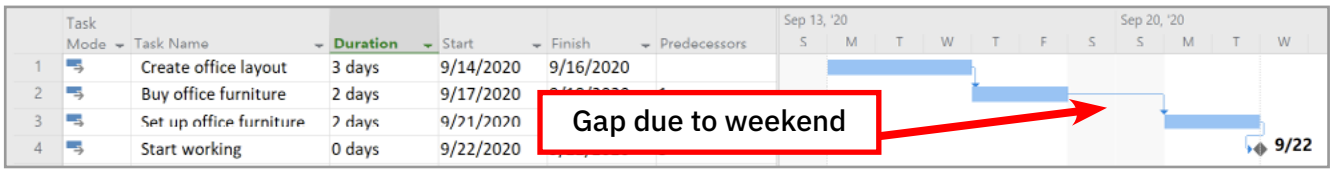
Changing working times or working days for a specific task

Sometimes you have tasks that must be scheduled outside of the typical office schedule. For example, when you have team members in other countries who have different office hours. Another example would be tasks that must be scheduled on the weekend, such as maintenance work.

In this example, I show you how to schedule a specific task on the weekend.

All other tasks will still follow the default working times, but one particular task will be scheduled on the weekend.

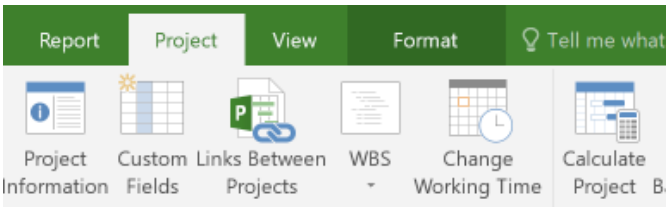
Here is a sample schedule for the setup of a new office:



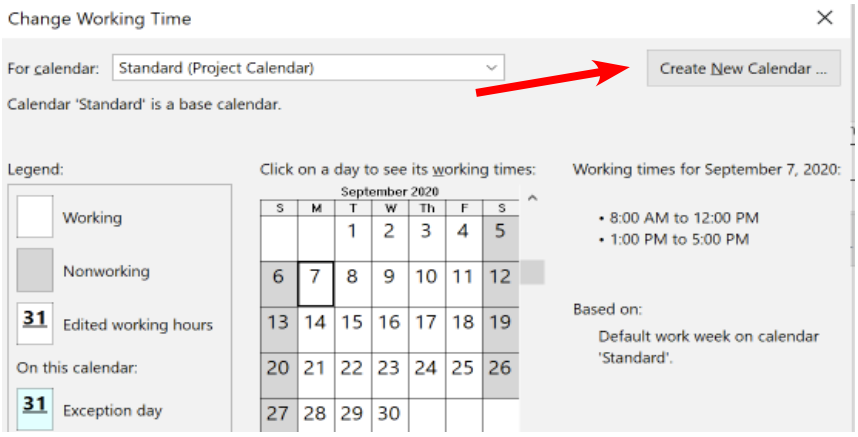
As you can see in the Gantt chart, there is a gap due to the weekend. Setting up the furniture only happens on Monday. As a result, our office can only open on Wednesday. So we lose two days!

Actually, we'd like to set up our furniture on that weekend. Let's schedule the furniture setup on Saturday & Sunday!

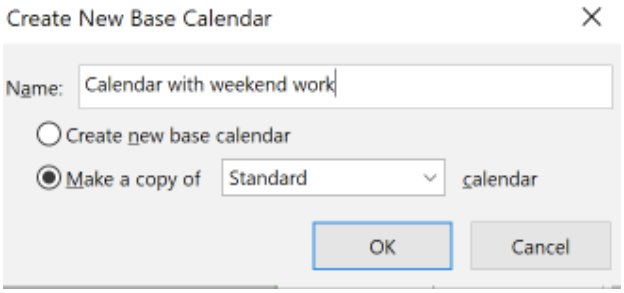
Click *Change Working Time*:



Click *Create New Calendar*:

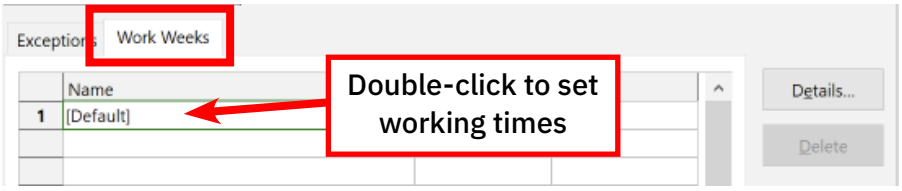


Give the new calendar a name:

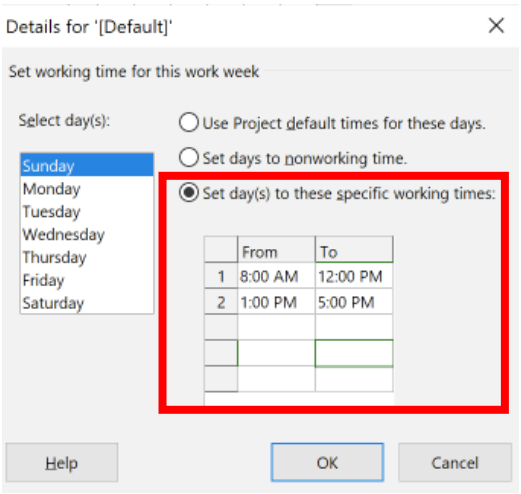


Project will make a copy of the standard calendar so that the working times for weekdays remain as before.

Next, you need to make Saturday and Sundays regular working days: Click on the *Work Weeks* tab at the bottom and double click on the first entry (Default):

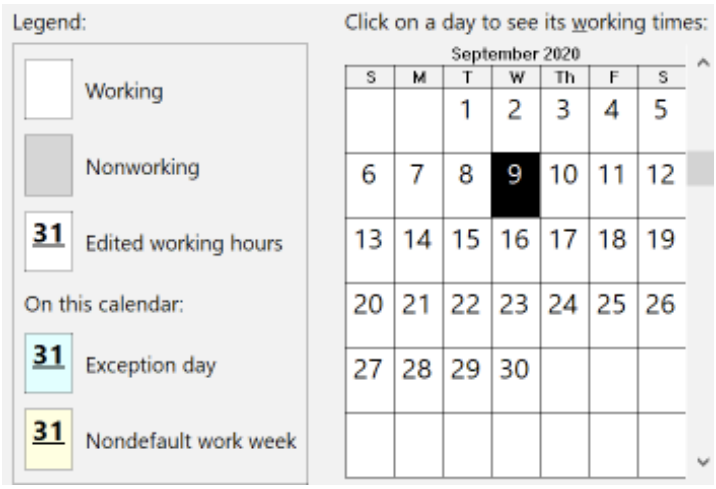


Change the working times for Saturday and Sunday:



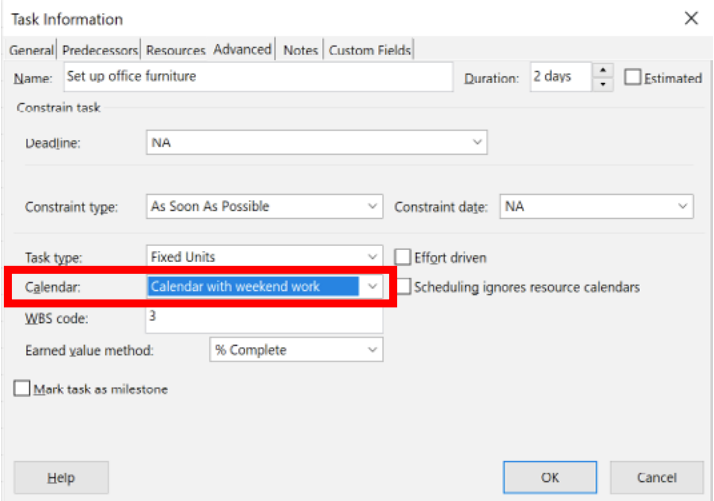
Press OK

In the working times overview you now can see that all days are working days:

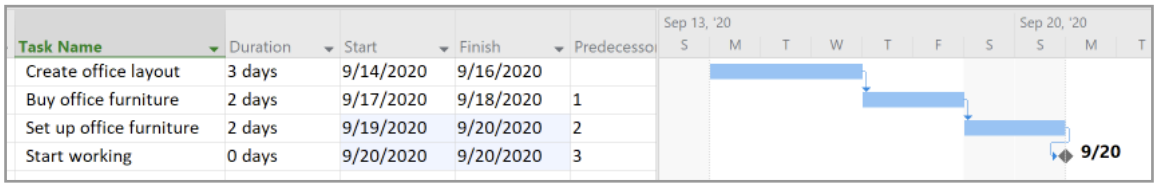


Close the window with OK

Now, double click on the task *Set up office furniture* which we want to schedule on the weekend. Under Calendar, select the weekend work calendar you've just created:



Here's the result! Project has now re-scheduled task "Set up office furniture" on the weekend. There is no more gap on the weekend for this task:



Well done!

Setting calendar and working times for specific resources

If you have team members whose working times are different from those of the rest of the team, you can assign them to a different calendar.

To set up working times / calendar for specific resources, follow the steps on page 51.

CHAPTER 7

Dependencies and constraints

In the previous examples we have always scheduled tasks one after the another: First do task A, then once task A has finished, start with task B and so on. This is the most common way of scheduling work. But in real projects, you often have more complex scheduling requirements.

For example:

- Two tasks should run in parallel, but task 2 may only start 2 days after task 1 has started (a scheduled lag of 2 days). Think of a construction task, where you are waiting for an earlier task to have progressed a bit so that you can do you job.
- Task A can only start after task B has started. Example: Unloading cargo from a ship can only begin after the receiving team has started taking the cargo.
- A task can be scheduled at any time, but it can't finish later than at a certain date.
- A task must start exactly on a specific date.

These examples represent so-called constraints and dependencies, and in this chapter I'll show you how you can make your schedule follow such scheduling requirements.

Constraints vs. Dependencies

A task constraint in Project means there is some deadline that must be considered for the task. On the other hand, a dependency exists when one task can only be scheduled with consideration of some other task: the tasks are dependent.

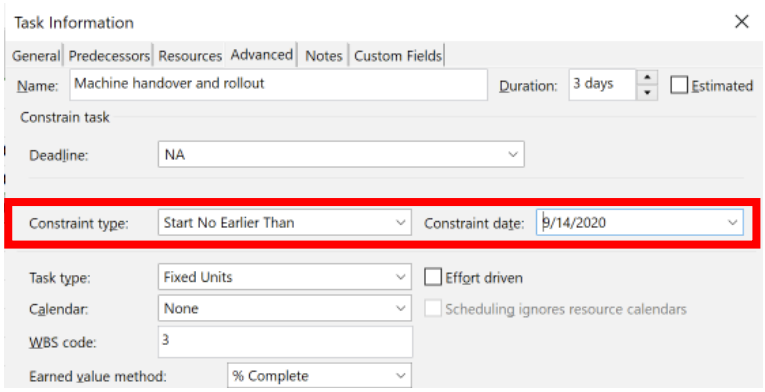
Task constraints

There are eight types of task constraints you can set in Project:

Constraint	Description
As Soon As Possible	This is the default when you schedule from a project start date. A task is scheduled ASAP, if possible right at the project start date.
As Late As Possible	Here, MS Project tries to schedule the task at the latest possible time. If you schedule backward from the project end date, this is the default way.
Start No Earlier Than	The task must start at or after a specific date.
Finish No Earlier Than	The task must finish by or after a specific date.
Must Start On	The task must start on a given date.
Must Finish On	The task must finish on a given date.
Start No Later Than	The task begins on or before a specific date.
Finish No Later Than	The task finishes on or before a specific date.

How to set a task constraint:

To enter a constraint for a task, double-click on the task in the Gantt view. Then enter the constraint you need for the specific case:



Task dependencies

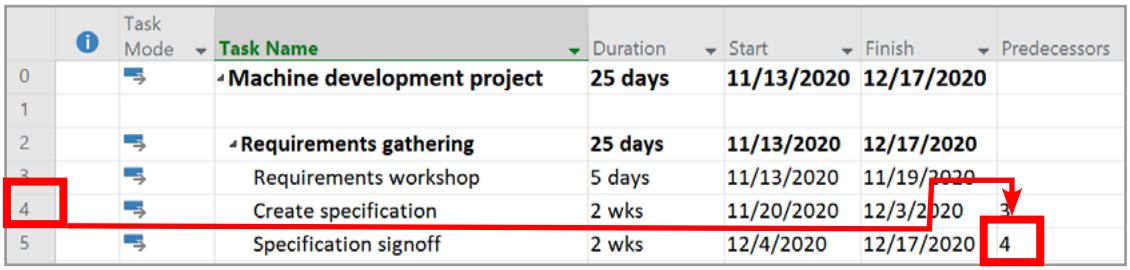
There are four types of dependencies that you can manage in MS Project:

Dependency type	Description
Finish-to-Finish	The related task (B) cannot be completed until another (A) has been completed.
Finish-to-Start	This is what you use in most cases! A task (A) task must finish so the next task (B) can start. This relationship may even exist when two activities are not causally linked. For example when you have several tasks that require the same type of equipment and you have only one equipment (e.g. crane).
Start-to-Start	The dependent task (B) cannot start until the task that it depends on (A) has started
Start-to-Finish	The dependent task (B) cannot be completed until the task that it depends on (A) begins.

How to enter a task dependency

There are two ways how you can maintain task dependencies. I will show you both methods here.

Via the predecessor column: The first – and easiest – way of maintaining a dependency for a task is by using the *Predecessor* column:

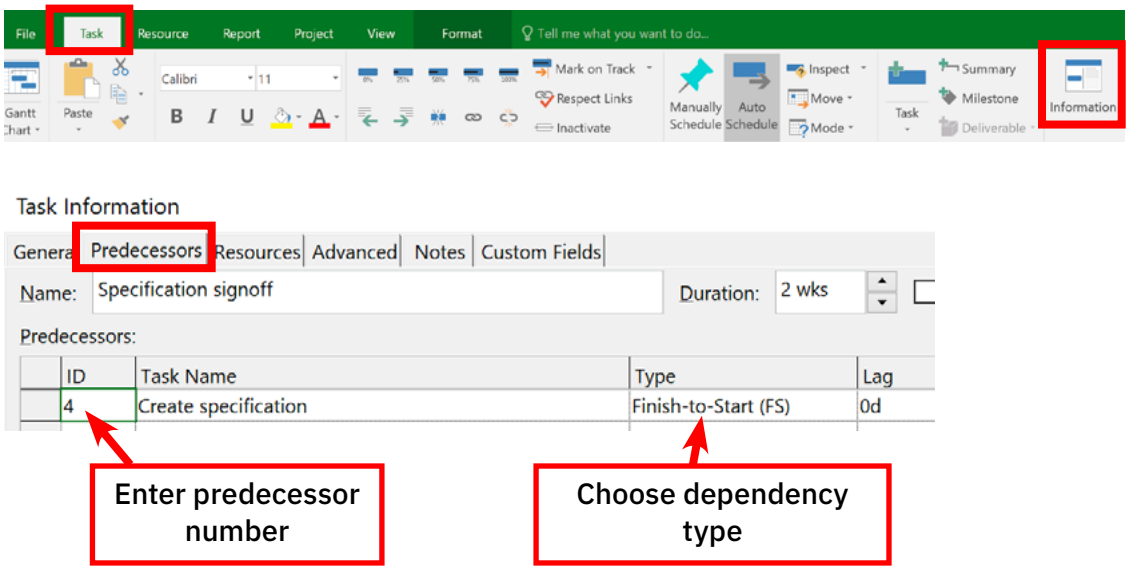


	Task Mode	Task Name	Duration	Start	Finish	Predecessors
0		**Machine development project**	**25 days**	**11/13/2020**	**12/17/2020**	
1						
2		**Requirements gathering**	**25 days**	**11/13/2020**	**12/17/2020**	
3		Requirements workshop	5 days	11/13/2020	11/19/2020	
4		Create specification	2 wks	11/20/2020	12/3/2020	3
5		Specification signoff	2 wks	12/4/2020	12/17/2020	4

In this example, we have entered the tasks that must be finished, before the next task can start. For example, signoff of the specification (task no. 5) can only start after the specification has been created (task no. 4).

Important: A task can also have more than one predecessor, that is tasks that must be completed before the task can start. If a task has multiple predecessors, you simply enter the predecessor numbers in the Predecessor column separated by comma. For example: 4, 7, 15 would mean that tasks 4, 7 and 15 are predecessors.

Via the *Task information*: The other way you can enter dependencies for a task is by double-clicking on the task (or selecting the task row and calling *Task Information*):



In the above screen you can choose the dependency type, that is how the tasks should be linked (see page 41 for an explanation of the dependency types).

Examples

Let's do a couple of examples where we use constraints and dependencies.

Example: Customer wants machine delivered after a specific date

You are building a machine for a client during the summer. You ask the client when he is ready to start rolling it out at his company. He says he is ready as of Monday, September 14th 2020.

What constraint is this? This is a **Start-No-Earlier-Than** constraint.

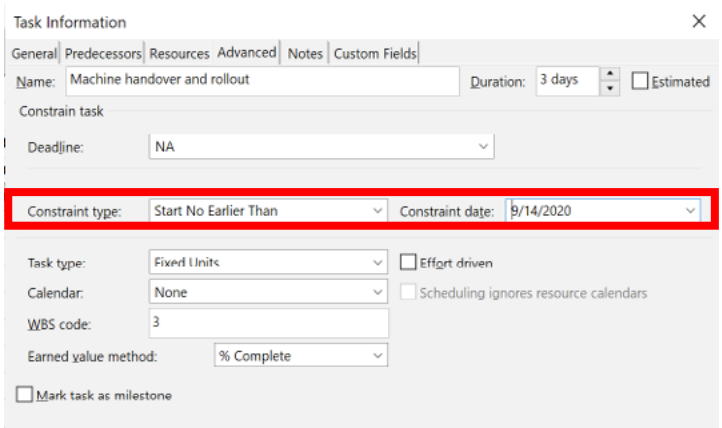
Here's how you set it up:

Our project schedule:

Task Mode	Task Name	Duration	Start	Finish	Predecessors
	Get machine requirements	5 days	7/1/2020	7/7/2020	
	Build machine	40 days	7/8/2020	9/1/2020	3
	Machine handover and rollout	3 days	9/2/2020	9/4/2020	4

Right-click on the task that should be constrained: *Machine handover and rollout*.

Go to tab *Advanced* and choose constraint type *Start No Earlier Than* and enter the constraint date 14th of September 2020:



Now as you can see MS Project has added a no-work period beginning of September because we specified a date constraint:

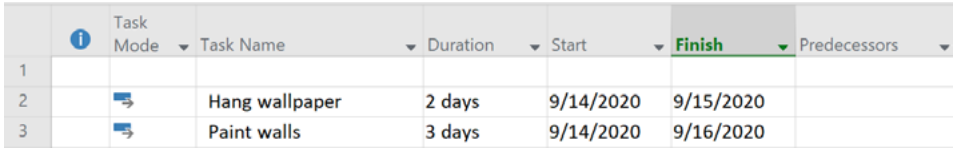
The rollout correctly begins on September 14th 2020. This is how constraints work.

Example: Project with dependencies

When we scheduled several tasks one after the other in the beginning chapter, we already used dependencies without explicitly talking about them. When one task is linked to follow straight onto another task, those tasks are linked via a Finish-To-Start (FS) dependency, meaning the first task A must be completed before the second task (B) can start.

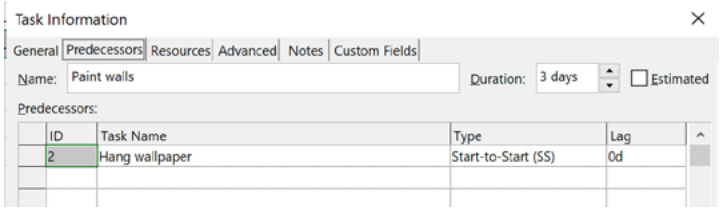
In this example we are going to use other dependency types.

In your house, you want to hang new wallpaper and then paint the walls. You want both tasks to happen at the same time, so you add a Start-to-Start dependency in MS Project:

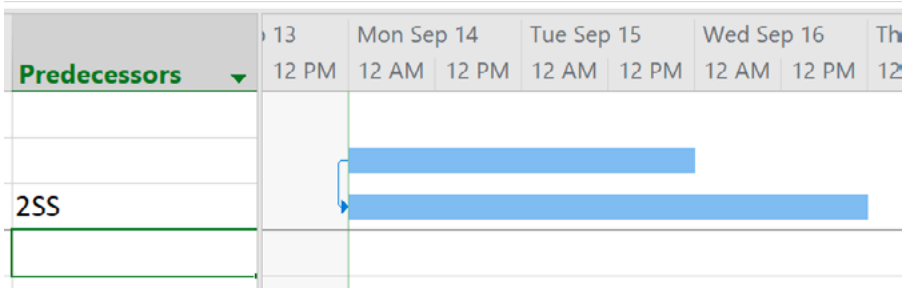


	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1						
2		Hang wallpaper	2 days	9/14/2020	9/15/2020	
3		Paint walls	3 days	9/14/2020	9/16/2020	

Double-click on the task 3 (Paint walls) and open the *Predecessors* tab. Then enter the following data:



Tip: You can even define a lag here! Assuming that task *Paint walls* should start 1 day **after** task *Hang wallpaper* has started, you enter a lag of 1d (1 day).



How to set deadlines for tasks

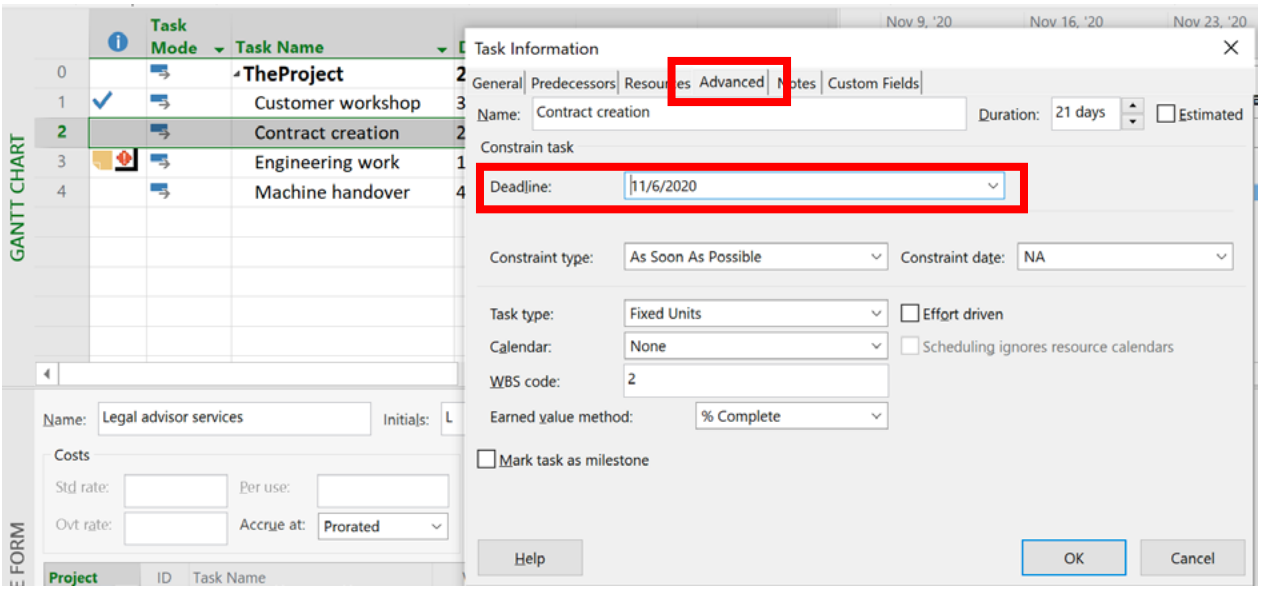
You should always allow Microsoft Project to calculate the finish date of tasks and never set finish dates manually (this will only mess up your schedule).

If you still want to set a task to finish on a certain date, you have two options:

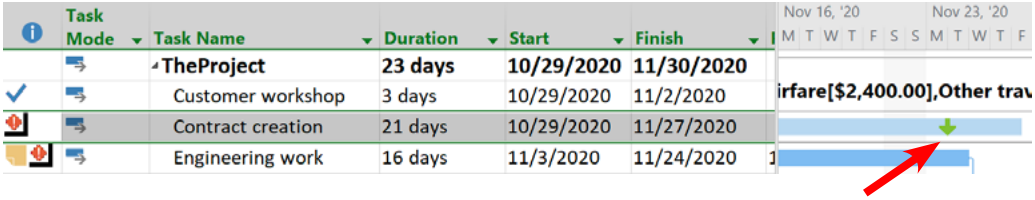
- **Enter a constraint:** Enter a constraint such as "Assembly of machine to finish after 01/20/2020" (see page 40 to learn more about constraints). This will actually change your schedule, but you should use constraints scarcely.
- **Enter a deadline:** A deadline is simply a reminder that a task is due. Setting a deadline will not change the schedule. In many cases this is the better option.

How to set a deadline:

Double-click on the task and go to the Advanced tab. Enter the desired deadline:



The newly set deadline is then visible on the task bar as a down arrow:



CHAPTER 8

People, equipment and more: Working with resources

No matter what project you're involved in, you are always dependent on various resources: people, equipment to get specific tasks done, materials used or other items you will incur cost for. These resources determine how you schedule a project, because you can't freely dispose about your resources 24/7.

Examples of resources: people, equipment, materials, plane tickets, hotel cost, budgets

With the resource planning feature of MS Project, you can accommodate resource restrictions in your schedule so that it reflects the real limitations you have to deal with.

Why should you use resources in Project?

- Create project schedules that factor in the availability of resources
- Plan your project costs using standard rates (for labor and material)
- Track actual costs based on the actual resource usage.
- Factor in things like part-time work and other common scenarios
- Monitor your budget in MS Project

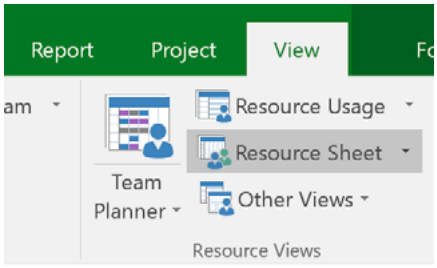
Rule: Any item that we will incur cost for must be entered as a resource.

How to set up resources

Before you can use resource for scheduling purposes, you need to tell MS Project which resources you are going to use. MS Project supports three resource types: work resources (i.e. people and equipment), material and cost resources.

Resources are maintained in the *Resource Sheet*.

Go to Tab *View* → *Resource Sheet*:



The Resource Sheet

As a first example, let's enter several typical resources so that you get the concept. The first resource is yourself, the project manager:

RESOURCE SHEET

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
1												
2	Project manager	Work		P	PM	100%	$100.00/hr	$150.00/hr	$0.00	Prorated	Standard	CF-PJ
3	Ashley Simpson	Work		A	Engineering	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	CP-ENG
4	Jeffrey Biggs	Work		J	Engineering	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	CP-ENG
5	Victoria Cortez	Work		V	Marketing	100%	$60.00/hr	$120.00/hr	$0.00	Prorated	Standard	CP-MKT
6	Simon Price	Work		S	Accounting	50%	$70.00/hr	$105.00/hr	$0.00	Prorated	Standard	CF-ACC
7	Ben Fox	Work		B	Sales	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	
8												
9	3D printing equipment	Work		3	Equipment	100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard	CP-ENG
10												
11	Polymer 1 lbs	Material		P	Material		$40.00		$0.00	Prorated		

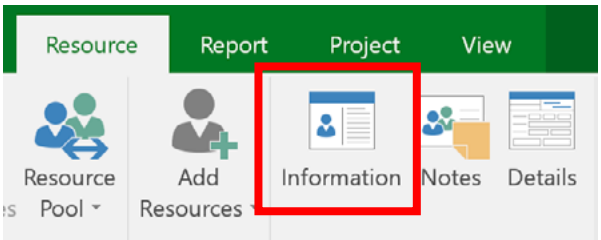
See how we have added people from different departments as resources. We have also added one piece of equipment – a 3D printer. Lastly, we also included Polymer material which is required for the 3D printing process.

Meaning of the columns:

- **Type:** Type of resource. Enter Work for work-driven resources (people, equipment), Material for materials, Cost for cost resources, such as services used
- **Material (Material label):** For material resources, enter a label. For example the units of measure such as “lbs.” for pounds, “kg” for kilograms or “thousand” for a box of thousand bricks.
- **Initials:** Initials help you identify resources, for example in the Gantt view.
- **Group:** you can define groups of resource to make it easier to filter and sort resources when you have a lot of them. Groups could be *Internal* or *External*
- **Max.:** This is the maximum resource units available to the project. 100% means a resource is 100% available for the project (every working day of the calendar). This field can be used to specify part-time workers.
- **Std. Rate:** Cost rate of the resource . For work resources, this is the per-hour rate. For material resources, it is the cost per unit (e.g. cost for 100 bricks). *Tip: You can also define time-dependent rates - just double click on the rates field.*
- **Ovt. Rate:** Overtime rate. How much does the resource get for overtime work? Overtime periods are defined via the calendar.
- **Cost/Use:** Usage fees are common with equipment. These are calculated based on usage and not on usage time.
- **Accrue:** Accrue At. Costs can accrue (= be booked) at the start of use, end of use or prorated, meaning based on the number of hours used.

I’ve entered the department assignment for those resources in the last column named *Code*.

You can also see resource details via the Resource tab → *Information*:



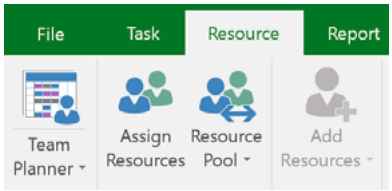
Assigning resources to tasks

Each task in a project is going to be performed by a specific resource. Once you have defined all resources, you can assign a resource to every task.

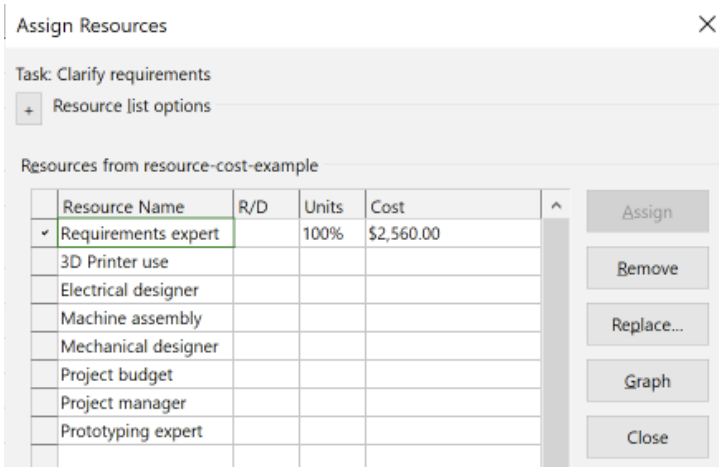
To assign a resource, select the respective task:

	Task Mode	Task Name	Duration	Start	Finish	R
0		IT Implementation Project	4 days?	10/12/2020	10/15/2020	Pr
1		Subtask 1	4 days?	10/12/2020	10/15/2020	
2		Subtask 1.1	4 days	10/12/2020	10/15/2020	
3		Subtask 1.2	1 day?	10/12/2020	10/12/2020	

Select the resource from the list and press *Assign Resources*:



Select the resources that should be assigned and press *Assign*:



Press *Close* after you've assigned the resources.

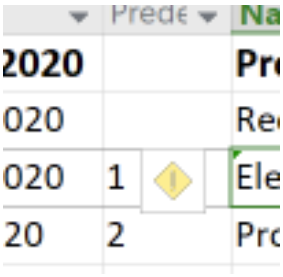
Remark about the *Units* field: Enter 100% if the resource is going to work full-time on the task. For part-time work, select a value less than 100%. Example: if you enter 50% that means that the person is going to work 50% of their available time on the task.

Note: You can assign also multiple resources to the same task.

The assigned resources now appear in the column *Resource Names* (enable this column if it isn't shown yet). In the column Work you can see the planned effort. In the *Cost* column you see the cost for the resource use (= hourly rate x number of hours based on the duration):

	Task Name	Duration	Start	Finish	Prede	Resource Names	Work	Cost
0	**Machine Project**	**29 days**	**10/12/2020**	**11/19/2020**		**Project budget**	**376 hrs**	**$26,160.00**
1	Clarify requirements	4 days	10/12/2020	10/15/2020		Requirements expe	32 hrs	$2,560.00
2	Create design	8 days	10/16/2020	10/27/2020	1	Electrical designer,	128 hrs	$9,600.00
3	Build prototype	5 days	10/28/2020	11/3/2020	2	Prototyping expert	80 hrs	$4,800.00
4	Review prototype with client	2 days	11/4/2020	11/5/2020	3	Prototyping expert	32 hrs	$2,240.00
5	Rework design	3 days	11/6/2020	11/10/2020	4	Electrical designer,	48 hrs	$3,600.00
6	Build final machine	7 days	11/11/2020	11/19/2020	5	Machine assembly	56 hrs	$3,360.00

You might see a warning sign at a task, MS Project wants to know how you want to treat the resource addition in your schedule. Why? When you assign resources to a task, this has some impact on your schedule, and I'll cover it on page 55.



Read chapter How MS Project schedules tasks on the basis of resources to learn more about how MS Project schedules your project on the basis of effort, duration, work and resources.

Setting individual working times for specific people

Project uses default working times and working days for scheduling. Standard working times are Monday – Friday from 8:00am – 5:00pm with a 1-hour lunch break.

In the real world your team members may have different contracts with different working times. To create a realistic schedule, you want to take those actual working times into account. Project has a simple solution for this.

You can decide which calendar should be used for each resource, and the calendar defines the working times and days.

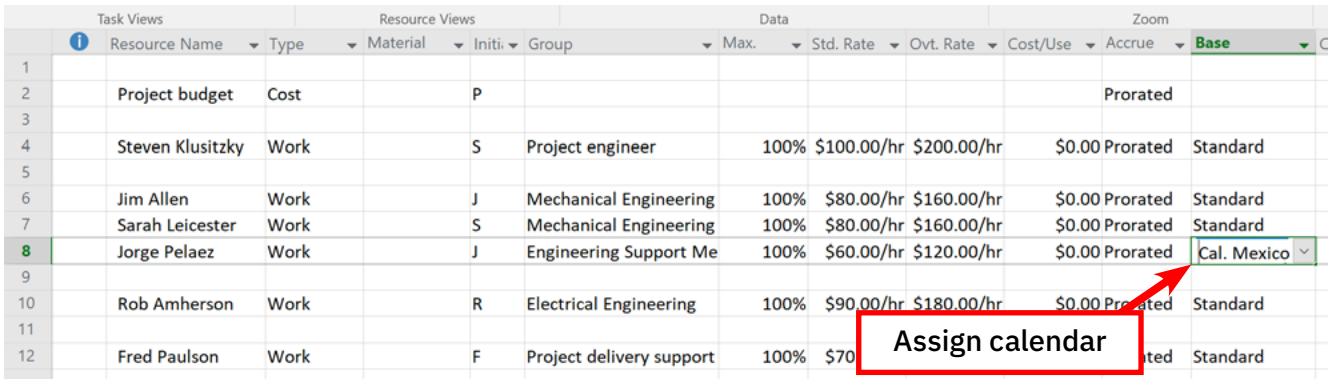
Examples for situations where you want to use resource calendars:

- For part time workers
- For team members from other countries who work at different office hours
- For team members from other countries having different bank holidays.

Here is how you set the calendar for a specific employee:

In this example we have a team member from our Mexican subsidiary. We want to set his working days and times to reflect Mexican working times.

First, create a new calendar (see page 32 for the steps) with the working times and days of Mexico. Then go to the *Resource Sheet* and assign the new calendar to the employee:



CHAPTER 9

How MS Project schedules tasks on the basis of resources

Users of Microsoft Project are often confused about why the program schedules tasks the way it does. They wonder why a task's automatically calculated finish date is not what they expected. The truth is: Project *does* calculate dates correctly, but many people don't understand the underlying logic the software uses for scheduling work.

One topic that people have the most difficulty understanding is how Microsoft Project behaves when you assign or remove resources to tasks. Adding or removing people to or from a task may actually change the task duration and the estimated efforts of team members. It is critical that you understand why this is the case. And this is the topic of this chapter.

When should you read this chapter? If you want to schedule your project on the basis of resources maintained within MS Project, then this chapter is a "must". If you only want to create simple schedules without keeping resources in MS Project, you can skip this chapter.

Before we dive into the details, we need to clarify a few basic concepts.

Effort vs. Duration

The first two concepts we need to clarify are effort (or work) and duration. These terms are used all across MS Project, so we need to be clear about their meaning:

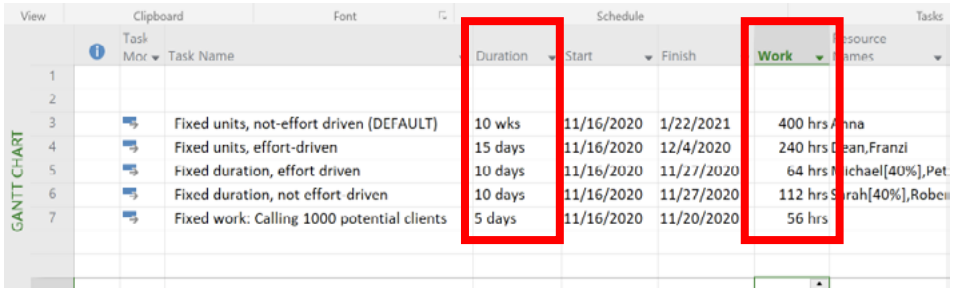
- Each task has set duration. **Duration** is the time until a task is finished. Duration is usually measured in days or weeks.
- **Effort** — which is called 'Work' in MS Project— is the amount of work that is required to complete a task. Effort (work) is usually measured in hours.

Example:

Jim, our lead engineer, has to create the technical drawings for a machine. He estimates his effort to be 40 hours. This is the effort (or work). Because he is also involved in other projects, he believes he can finish the task within one month. So, one month is the duration for his task of creating technical drawings.

Where can you find work (effort) and duration in Project?

In the *Gantt chart* view:



	Task Mode	Task Name	Duration	Start	Finish	Work	Resource Names
1							
2							
3		Fixed units, not-effort driven (DEFAULT)	10 wks	11/16/2020	1/22/2021	400 hrs	Anna
4		Fixed units, effort-driven	15 days	11/16/2020	12/4/2020	240 hrs	Dean,Franzi
5		Fixed duration, effort driven	10 days	11/16/2020	11/27/2020	64 hrs	Michael[40%],Pet
6		Fixed duration, not effort driven	10 days	11/16/2020	11/27/2020	112 hrs	Sarah[40%],Robe
7		Fixed work: Calling 1000 potential clients	5 days	11/16/2020	11/20/2020	56 hrs	

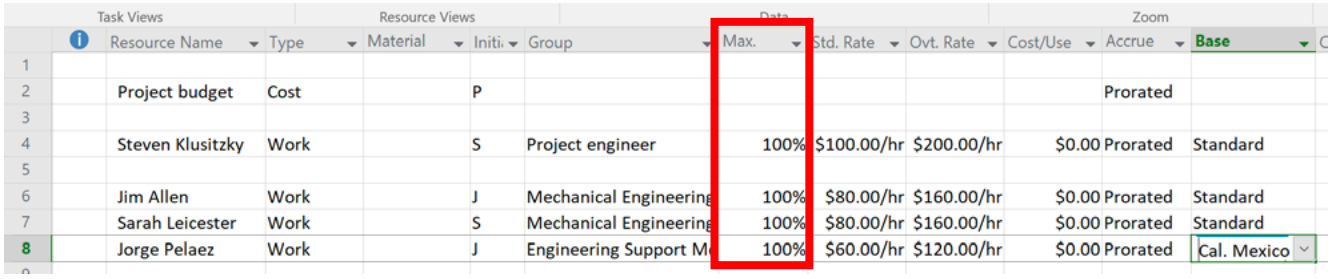
GANTT CHART

What are 'units'?

When you're working with resources in MS Project, you'll frequently read the term 'units' or 'Maximum units'. But what are *units*, actually?

Units are the percentage of the available time that a resource is dedicating to a project. For example, if John works 100% of his available time on a project the units will be 1.0 (100%) for him. 0.5 units means the resource is only working half of the time on a task (50%).

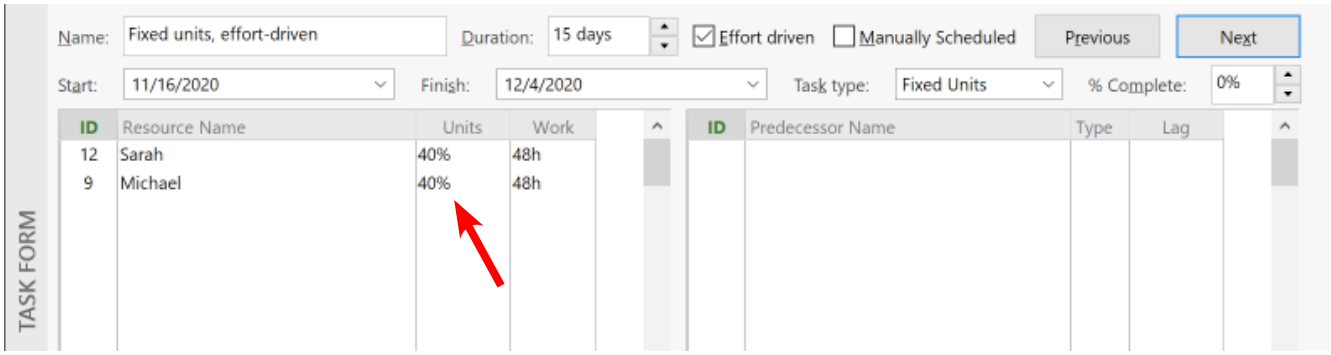
You can set the *units* value in the *Resource Sheet*:



	Resource Name	Type	Material	Initi	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
1											
2	Project budget	Cost		P						Prorated	
3											
4	Steven Klusitzky	Work		S	Project engineer	100%	$100.00/hr	$200.00/hr	$0.00	Prorated	Standard
5											
6	Jim Allen	Work		J	Mechanical Engineering	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard
7	Sarah Leicester	Work		S	Mechanical Engineering	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard
8	Jorge Pelaez	Work		J	Engineering Support M	100%	$60.00/hr	$120.00/hr	$0.00	Prorated	Cal. Mexico

This is the **maximum number of units** a team member can work on the project.

You can find the effective amount of units used for a specific task in the *Task Form*:

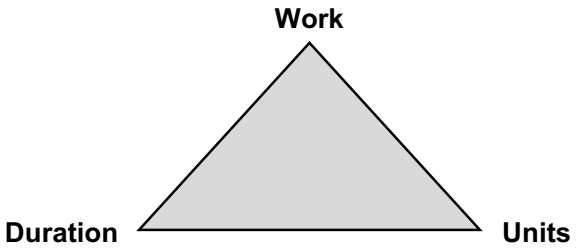


Work = Duration x Units: The Scheduling Formula

In the previous sections you learned about the difference between *duration* and *work*, and we clarified the meaning of the term *units* (resource units).

Now, I didn't talk about these terms just for fun. These terms are very important because they are used as parameters when MS Project calculates the schedule of your project.

We can show duration, work and units as parameters in a **scheduling triangle**, which shows the three parameters as interdependent parameters: If you change one parameter it is going to affect one of the other parameters. Which parameter is going to change depends on the **task type** you have set for the specific task. We cover task types on page 57).



The following formula shows the relationship between those parameters:

$$\text{Work} = \text{Duration} \times \text{Units}$$

This is the scheduling formula used by Microsoft Project! Here's how it works in an actual example:

Robert is responsible for creating the design of a new machine. The task is expected to require 80 hours of work (10 days). He can work on the design for 60% of the week (= 3 days per week).

From these values we can calculate the duration using the scheduling formula:

$$\text{Duration} = \text{Work} / \text{Units}$$

therefore

$$\text{Duration} = 80 \text{ hours} / 0.6 \approx 133.3 \text{ hours}$$

$$\approx 16.7 \text{ days}$$

Apart from keeping that formula in mind, your main takeaway from this section should be: never change one variable without actually thinking through what you are doing. It's always going to have an effect on the other variables!

How adding (or removing) resources will affect your schedule

Take the following scenario:

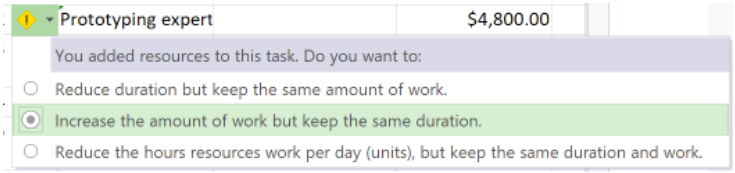
- Imagine you are in the office cleaning business. Your client has a 5-story office building with 12,000 square feet of office space.
- You are using Project to estimate the duration of the cleaning job.
- For this purpose, you have entered the names of your cleaning staff members into the Resource Sheet.

What happens if you assign more people (= resources) to this task? Of course, the cleaning can be done faster. And the more workers you add to the task, the earlier you are going to be done (the task duration will go down).

This is an obvious example where we can clearly say how MS Project should respond when we add more people to a task (it should reduce the duration). But the thing is: MS Project doesn't

understand the content of a task. For Project, the task 'Office cleaning' is just like any other task. **Therefore, we need to tell Microsoft Project how it should behave when we change the resource assignments for a task, specifically when we assign or remove people.**

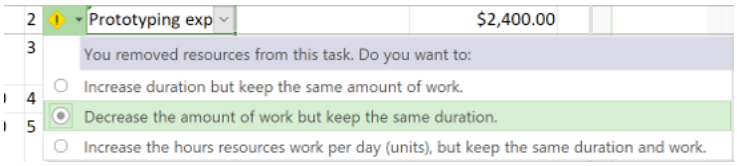
The great thing is: Project will ask you what it should do when you add or remove resources for a task. For example, if you add more people to a task, you will see a popup like this:



Now you have these options:

- **Reduce duration but keep the same amount of work:** This mean the estimated effort will be kept as before.
- **Increase the amount of work but keep the same duration:** The task effort will be increased, because more people contribute to the task. No change to the duration.
- **Reduce the hours resources work per day (units) but keep the same duration and work:** Total effort (= work) for the task remains unchanged, but each assigned team member will work fewer hours on the task.

What happens when you remove resources from a task? The opposite to what I showed you earlier will happen. You'll get the following popup:



Now you have these options:

- **Increase duration but keep the same amount of work:** With fewer people to help, the task will take longer to complete. The planned effort will not be changed.
- **Decrease the amount of work but keep the duration:** Reducing the amount of work means to reduce the estimated effort. The duration will be kept as before.
- **Increase the hours resources work per day but keep the same duration and work:**

> With a smaller team, each team member has to contribute more hours if you want to keep the scheduled deadline. The amount of work remains as before.

What's the takeaway from the above explanations?

Adding or removing resources from a task can have different consequences on your schedule and the key parameters – duration, work and units. Depending on the situation, the duration may change, the amount of work will change or the resource units will change.

The good news is:

Project has a very useful feature that allows you to pre-define for each task, how it should behave when you add or remove people (or resources in general). This behavior can be controlled with the help of so-called **task types**.

In the next chapter we'll take a look at these task types.

Task types

Task types are a setting that help you control how the scheduling parameters of a task – duration, work and units – change when you add or remove people to/from a task.

For example, think about construction work such as the covering of a roof. If you add more workers to the job it can be done faster, and each worker will have to work less.

But the same cannot be said for more conceptual work such as developing a business strategy. You can add more smart MBAs to the task in order to get better ideas. But due to the nature of the task, more contributors doesn't mean it can be finished earlier (the opposite effect is more likely).

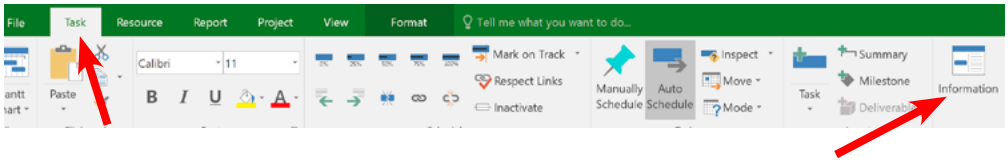
Because tasks in projects can be very different in their nature and their behavior to changes in duration, work and team member contribution, Project gives you a way to control this behavior with a simple setting on task level. This is what task types are for.

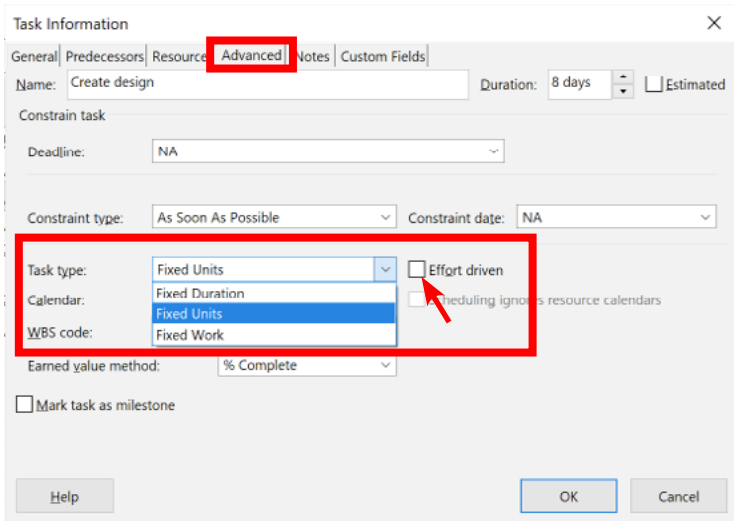
There are 5 task types:

- Fixed units and not effort-driven
- Fixed units and effort-driven
- Fixed duration and effort-driven
- Fixed duration and not effort-driven
- Fixed work

Task types are maintained in the task details:

To get there, either double click on a task or select it and press *Information*:





What is the difference between these task types?

Task Type	Explanation
Fixed units and not effort-driven	For tasks of this type, adding or removing resources will not change their duration. However, if you add more people, effective working hours and costs and will go up because more people are involved. Likewise, removing resources from the task will reduce working hours and labor costs. Why is it called fixed units? Because every resource will be contributing at a fixed %-level (e.g. 100% or 50% of their available time), and these units will not change, even if you add or remove resources or if you change the duration. *Example: John is developing a new software which takes him 40 hours of work. He's also involved in other projects, therefore he can only complete the software within four weeks (=duration).* *John's boss has the idea of also assigning Susan, John's coworker, to the task so she can help John by performing a few extra quality checks.* *Susan can contribute 10 hours to the task. With the chosen task type, the duration will remain the same even with Susan's support, but work will go up from 40 to 50 hours total (40h for John, 10h for Susan). Also, the task becomes more expensive because now two people are working on it.*
Fixed units and effort-driven	As with the previous task type, the amount of resource units (or resources) is also fixed. In addition, tasks of this type are effort-driven. This means that the duration depends on the amount of effort we put in. With more people we can get it done quicker. With fewer people it will take longer. What about work and cost? The total amount of work required stays the same, as do labor cost. *Example: Sarah is assigned to a task at 40% of her available time. With her being as the only resource, the task will take 30 days to complete (30 days duration, 40% x 30 days = 12 days of work). Then, another colleague, Michael, is assigned to the same task, again at 40% of his time. With it being an effort-driven task, the duration will shrink to 15 days, and both Sarah and Michael will have to contribute 6 days each. Total work remains at 12 days.*

Task Type	Explanation
Fixed duration and effort-driven	The fixed-duration task type is used when you know the exact duration or want to keep duration constant. If you add more resources to the task, the workload is shared among the assigned resources. Each person will have to work fewer hours as a result. However, the duration of the task will remain fixed, even if you assign more people to it (the reverse is true when you remove resources from such a task). *Example: Imagine a trade show which lasts 2 weeks (the duration is fixed). You have a team of assistants which are supposed to interview 200 random guests to see if they like the show. You can add more resources to that task and each of the assistants will have fewer interviews to do.*
Fixed duration and not effort-driven	For such tasks, the duration is fixed. Adding resources will not reduce the duration, and removing resources from the task will not increase duration. What will change however is the amount of work that goes into the task: if you add more people, more hours will be spent (increasing your labor costs). Conversely, if you remove people from the task, fewer hours will be spent on the work and your costs will be lower. *Example: An example would be a 10-day company event (= fixed duration) that you've hired 20 security guards for. You want to hear 10 more guards to increase the level of security. This doesn't mean that each guard has to work less (it is not an effort-driven task). As a result, more guards to add to the total amount of work and consequently labor costs will increase. The duration of the task however stays fixed, even if you add or remove resources.*

Task Type	Explanation
Fixed work	Tasks marked as 'Fixed work' require a fixed amount of work (or effort) to complete. These are usually manual or product-based tasks, like in construction or manufacturing. You can add more resources to such tasks, and each resource will have to bear a fraction of the total work. Removing resources from fixed-work tasks will result in each assigned resource having to bear a greater workload. The task duration will decrease or increase depending on whether you add or remove resources. *Example: You have a list of 1000 potential clients which you want to call and offer your product to.* *You estimate each call takes 3 minutes on average. If you only had one sales agent, it would take 3000 minutes (or 50 hours) to call all customers on the list.* *If you added one more agent and the agent would call the other half of customers, the task duration would decrease to 25 hours, and each person would only have to spend 25 hours on the task.* *With 10 sales agents, it will only take 5 hours and so on.*

Tip: The easiest way to understand the differences is to create a sample project with a sample task for each of the task types. Play around with the resource assignments and see how the duration, workload or units change.

Maintaining the scheduling parameters for your project

Once you have defined the task type for each task (to read about task types, see page 57), you need to maintain the scheduling parameters duration, work and units. Only then Microsoft Project will be able to calculate (or schedule) your project.

If you're not familiar with these parameters, see page 52.

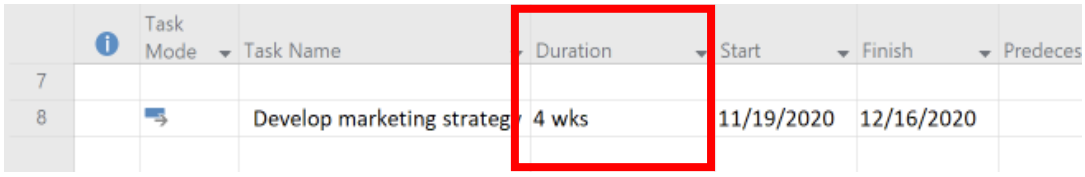
Which parameters you have to maintain depends on the task type you have chosen:

- For **fixed unit-tasks**, you need to maintain the resource units
- For **fixed duration tasks**, you need to set the duration because it is fixed.
- For **fixed work tasks**, you need to set the amount of work.

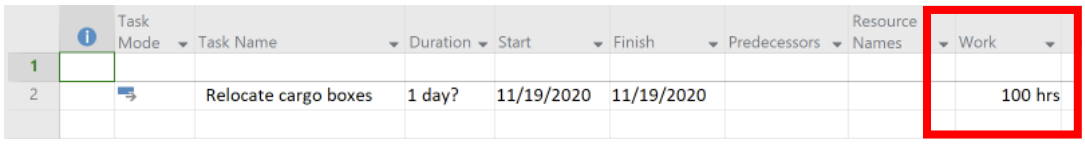
Maintaining resource units:

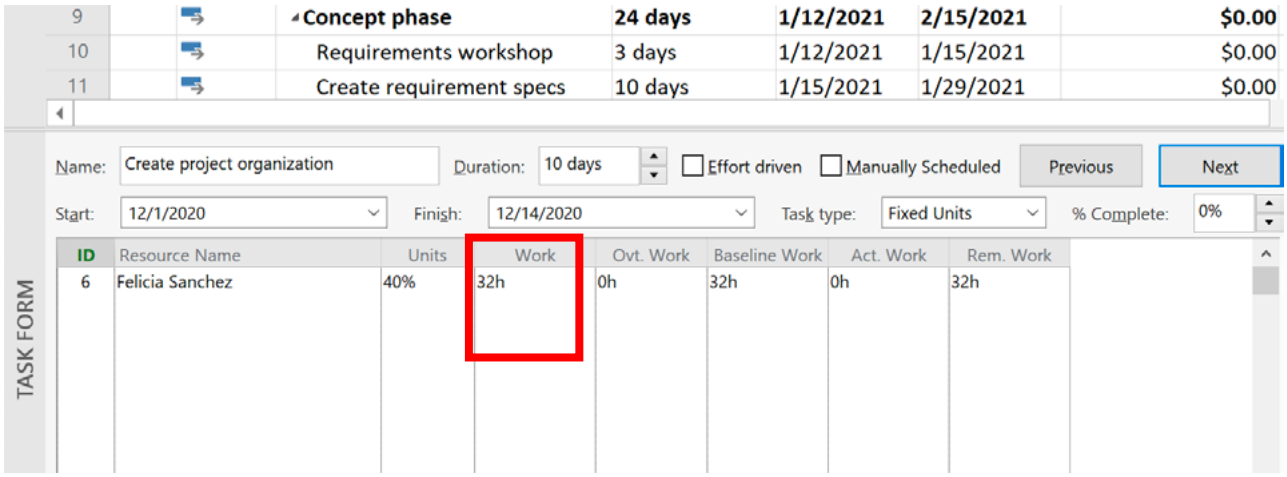
- This is done in the Resource Sheet and in the Task Form – see page 53 on how to maintain units.

Maintaining the duration:



Maintaining the planned amount of work:





9	**Concept phase**	**24 days**	**1/12/2021**	**2/15/2021**	**$0.00**
10	Requirements workshop	3 days	1/12/2021	1/15/2021	$0.00
11	Create requirement specs	10 days	1/15/2021	1/29/2021	$0.00

TASK FORM

Name: Create project organization Duration: 10 days Effort driven Manually Scheduled Previous Next

Start: 12/1/2020 Finish: 12/14/2020 Task type: Fixed Units % Complete: 0%

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
6	Felicia Sanchez	40%	32h	0h	32h	0h	32h

CHAPTER 10

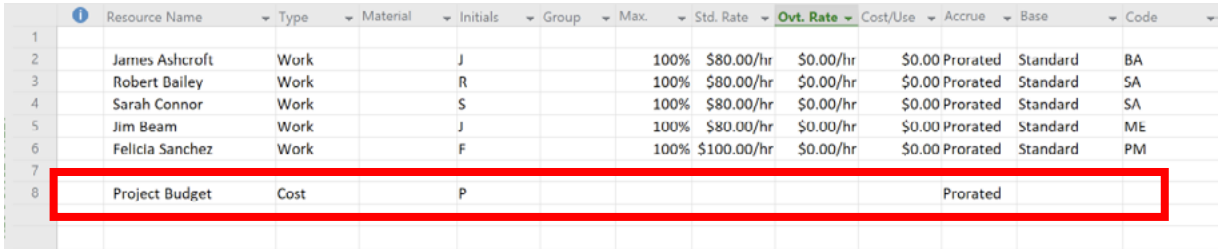
Entering a planned budget

To be able to compare your actual cost against the approved budget, you also need to enter the budget into MS Project. MS Project has a clever solution for this: **You simply have to enter the project budget as a "special" budget resource in the resource sheet.**

Create a budget resource

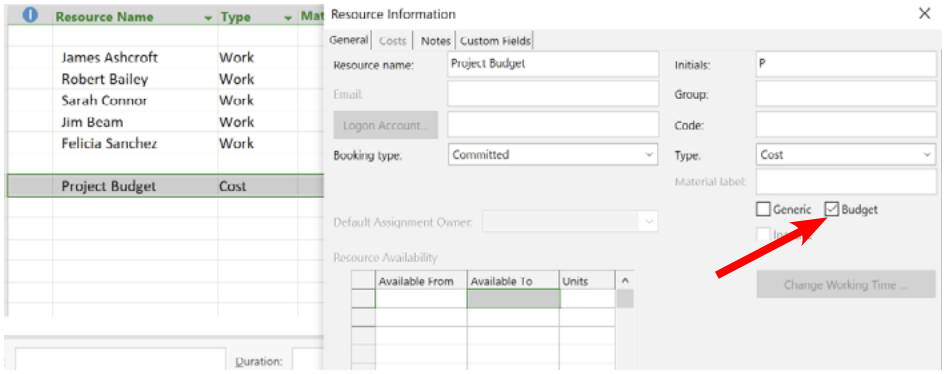
First you need to create a 'budget resource' which can store the project budget value:

Go to the *Resource Sheet* and enter 'Project Budget':



	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
1												
2	James Ashcroft	Work		J		100%	$80.00/hr	$0.00/hr	$0.00	Prorated	Standard	BA
3	Robert Bailey	Work		R		100%	$80.00/hr	$0.00/hr	$0.00	Prorated	Standard	SA
4	Sarah Connor	Work		S		100%	$80.00/hr	$0.00/hr	$0.00	Prorated	Standard	SA
5	Jim Beam	Work		J		100%	$80.00/hr	$0.00/hr	$0.00	Prorated	Standard	ME
6	Felicia Sanchez	Work		F		100%	$100.00/hr	$0.00/hr	$0.00	Prorated	Standard	PM
7												
8	Project Budget	Cost		P						Prorated		

Double-click on the new resource and set the *Budget* flag:



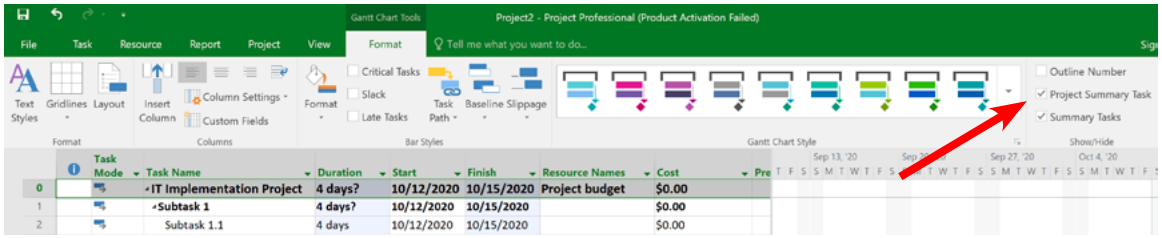
By setting this flag, MS Project knows that this resource should be used to store the budget.

Now we have created a budget resource. But where can you enter your total budget? I'll show you in the next section.

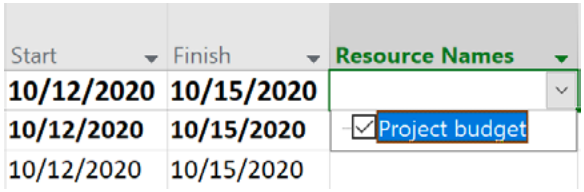
Entering your total project budget

The total project budget must be entered on **the top-level node** in the project structure. This is also called the *Project Summary Task* which can be shown as follows:

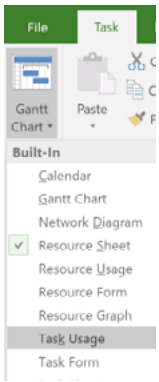
Set the check for Project Summary Task:



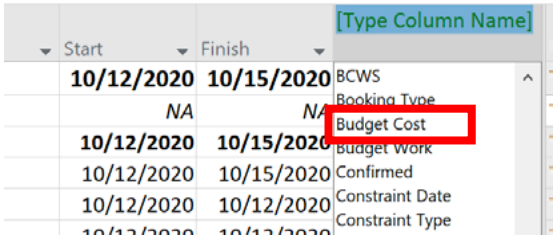
Next, assign the budget resource to the project summary task. This is done in the Gantt view:



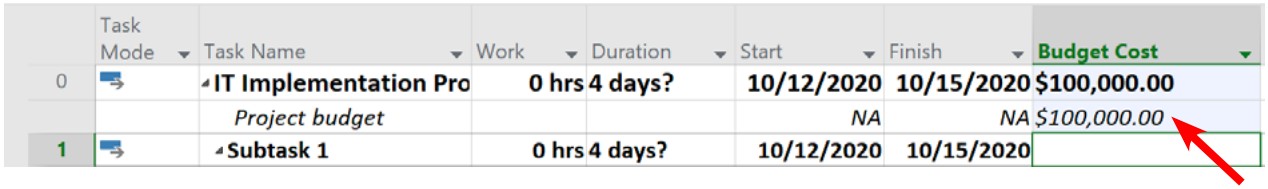
To enter the budget amount, open the *Task Usage* view:



Add a new column named *Budget Cost*:



Enter the amount into the non-summary task level. In the example we set the budget to $100'000:



	Task Mode	Task Name	Work	Duration	Start	Finish	Budget Cost
0		**IT Implementation Pro**	**0 hrs**	**4 days?**	**10/12/2020**	**10/15/2020**	**$100,000.00**
		Project budget			*NA*	*NA*	*$100,000.00*
1		**Subtask 1**	**0 hrs**	**4 days?**	**10/12/2020**	**10/15/2020**	

Note: Budgets can only be assigned to summary tasks. You can't assign budgets to normal "work" tasks.

Entering budgets for specific cost types

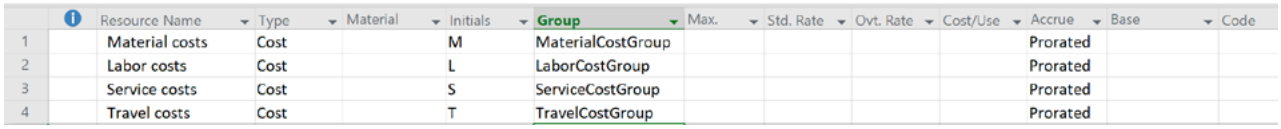
In the previous section I showed you how to enter the total planned budget for your project. Instead of assigning one big total amount, you can also split the budget into several "buckets" and define specific amounts for each cost type:

Material costs	$70,000
Labor costs	$20,000
Service costs	$10,000
Travel costs	$7,000
Total budget:	**$107,000**

Your project's total budget is then the sum of the individual budgets.

How to enter individual budgets for each cost type:

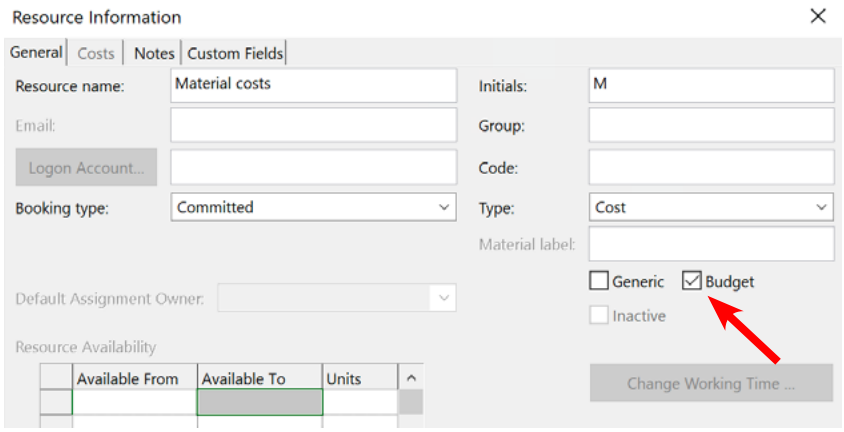
Go to the Resource Sheet and define one "cost resource" for each cost type:



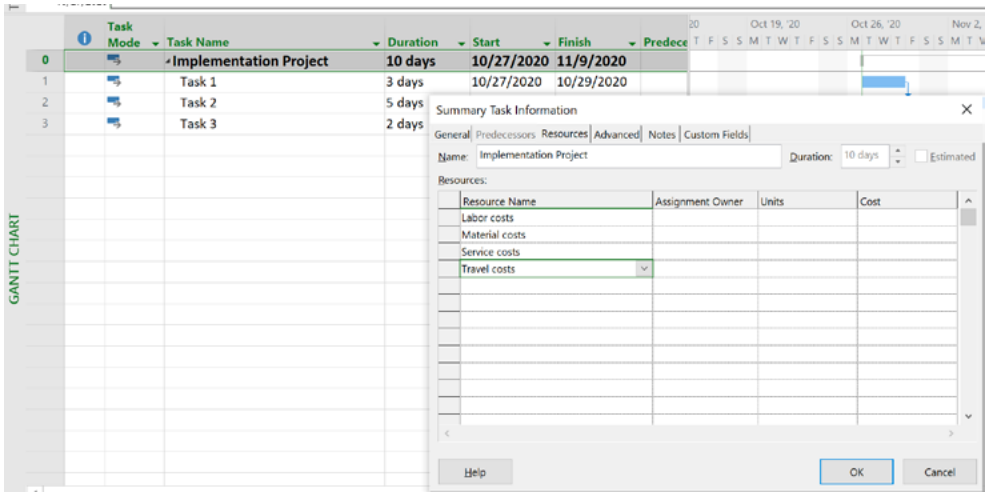
	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
1	Material costs	Cost		M	MaterialCostGroup					Prorated		
2	Labor costs	Cost		L	LaborCostGroup					Prorated		
3	Service costs	Cost		S	ServiceCostGroup					Prorated		
4	Travel costs	Cost		T	TravelCostGroup					Prorated		

(I've also entered different cost groups which are helpful to separate costs in the reporting)

Make sure you tick the "Budget" flag for each resource. Only then will you be able to use the resource as a budget:



Now go to the Gantt chart view and make sure the *project summary task* is shown (see page 15: How to show the project summary task). Double click on the project summary task and assign the budget resources you just created:



Press OK

Now there's one step missing: you need to enter the **budget amounts** for each cost type.

To do this, go into the *Task Usage* view:

Task Mode	Task Name	Work	Duration	Start	Finish	Budget Cost
	Implementation Proje	**0 hrs**	**10 days**	**10/27/2020**	**11/9/2020**	**$107,000.00**
	Material costs			*NA*	*NA*	*$70,000.00*
	Labor costs			*NA*	*NA*	*$20,000.00*
	Service costs			*NA*	*NA*	*$10,000.00*
	Travel costs			*NA*	*NA*	*$7,000.00*
	Task 1	0 hrs	3 days	10/27/2020	10/29/2020	
	Task 2	0 hrs	5 days	10/30/2020	11/5/2020	
	Task 3	0 hrs	2 days	11/6/2020	11/9/2020	

Now your budget estimates are entered into the project!

To be able to track costs in these categories, we also need to create the needed work or cost resources which I'll show you in the next chapter.

Entering resources to be able to track project costs

The previous steps were all about setting up a planned budget.

The budget amount gives you a number we can book our costs against. But with a budget alone, we are not yet able to track our ongoing project expenses: The airfare we have to pay, the parts that needed to be purchased, the fees from our tax advisor and so on.

To be able to continuously track project costs, you need to create specific **cost resources** where you can book your costs against.

In the following sections I'll show you how to create cost resources for various common cost types, such as service costs or travel expenses.

Entering materials and material costs

If your projects involve physical objects like buildings or machines, you are probably going to use certain materials in the project. These can be raw materials or parts purchased from a supplier.

In this section I show you how to enter project materials in MS Project.

For each material, create a **material resource** in the *Resource Sheet*:

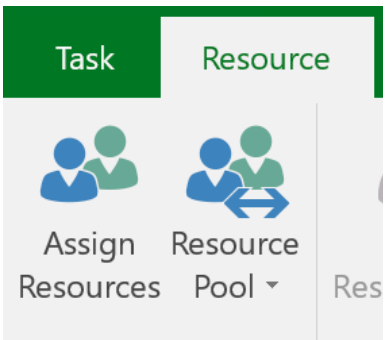
	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
1	Project manager	Work		AN	PM	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	
2	Mechanical designer	Work		MD	DES	100%	$70.00/hr	$140.00/hr	$0.00	Prorated	Standard	
3	Electrical designer	Work		ED	DES	100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	
4	Machine assembly	Work		M		100%	$60.00/hr	$120.00/hr	$0.00	Prorated	Standard	
5	Prototyping expert	Work		P		100%	$60.00/hr	$120.00/hr	$0.00	Prorated	Standard	
6	Requirements expert	Work		R		100%	$80.00/hr	$160.00/hr	$0.00	Prorated	Standard	
7												
8	Project budget	Cost		P						Prorated		
9												
10	3D Printer use	Work		3		100%	$40.00/hr	$40.00/hr	$800.00	Prorated	Standard	
11												
12	Hydraulic valves	Material	valves	H			$35.00		$0.00	Prorated		
13	Electric valves	Material	valves	E			$75.00		$0.00	Prorated		
14	Clutches	Material	clutches	C			$1.25		$0.00	Prorated		

For this example, I have entered 3 materials with their price per unit.

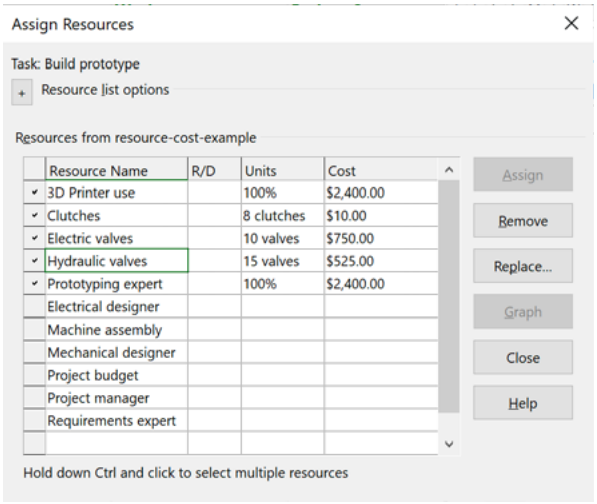
Go back to the Gantt view and assign the material resources to the task(s) where they are going to be used. In our example, we'll use the materials in the "*Build prototype task*".

Select the task and press *Assign Resources* (in the *Resource* ribbon):

	Task Mode	Task Name	Duration	Start	Finish
0		**Machine Project**	**29 days**	**10/12/2020**	**11/19/2020**
1		Clarify requirements	4 days	10/12/2020	10/15/2020
2		Create design	8 days	10/16/2020	10/27/2020
3		Build prototype	5 days	10/28/2020	11/3/2020
4		Review prototype with client	2 days	11/4/2020	11/5/2020
5		Rework design	3 days	11/6/2020	11/10/2020
6		Build final machine version	7 days	11/11/2020	11/19/2020



In the *Assign Resources* window, enter the number of units (quantities) of the materials you want to use. They are now assigned to the task. Press *Close* to leave the window:



The costs are calculated as the per-unit rate x number of units used.

Creating cost resources for project travel

If your project involves traveling, you want to be able to specify in detail the amount you plan for airfare, accommodation and other travel-related expense categories.

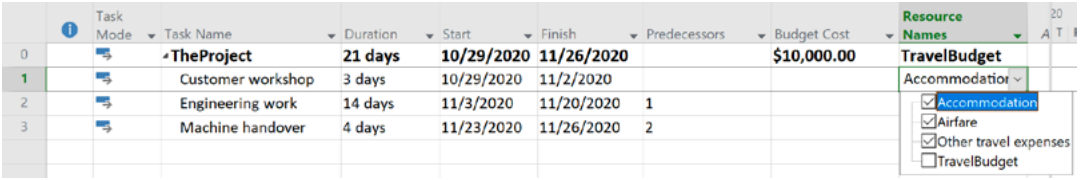
To be able to do that (and to allow you to track actual travel expenses), you need to define appropriate cost resources for travel.

The travel cost resources are created in the *Resource sheet*. The following example will make it clear. I have defined 3 cost resources for airfare, accommodation and other travel expenses:

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
2	Project Budget	Cost		P						Prorated		
3												
4	Airfare	Cost		A	TravelBudgetCosts					Prorated		
5	Accommodation	Cost		A	TravelBudgetCosts					Prorated		
6	Other travel expenses	Cost		O	TravelBudgetCosts					Prorated		

Note: they must be set up as cost resources (column *Type*).

After you've created the resources, you need to assign them to the respective task. Assigning in this case means: Let MS Project know which of the tasks involve traveling:



Creating cost resources for external services

If your project uses services from external companies, here is how you set those up as resources.

Examples for services:

- consulting services from a consulting firm
- legal advice from a legal advisor
- auditing services from an auditing firm

The first step is to create a cost resource for each service in the *Resource Sheet*:

RESOURCE SHEET

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
7											
8	Project Budget	Cost		P						Prorated	
9											
10	Legal advisor services	Cost		L	ExternalServicesGroup					Prorated	
11	Consulting service by McKinsey	Cost		C	ExternalServicesGroup					Prorated	
12	Tax consulting regarding sales tax	Cost		T	ExternalServicesGroup					Prorated	
13	GE Liability Insurance	Cost		G	ExternalServicesGroup					Prorated	
14	Quality inspection services	Cost		Q	ExternalServicesGroup					Prorated	

The type for external service resources must always be set to “Cost”.

Once you’ve created the resources, you need to specify what task will use these resources. This is done by assigning the resources to the respective task (see section: Assigning resources to tasks)

CHAPTER 11

Taking the baseline of your schedule

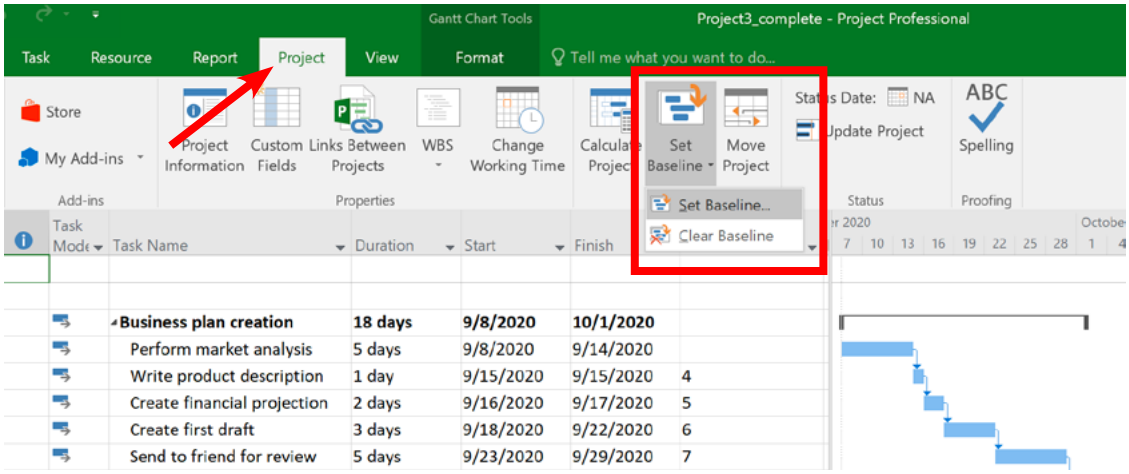
Once you have planned out your project, added resources and cost estimates, and are ready to start, it is time to perform one important step: taking the baseline of your schedule.

A baseline is a "snapshot" of your project schedule at a given point in time (basically a copy). Usually, you do this once you have the "official" schedule ready – the plan and budget you got approved by the sponsor or client.

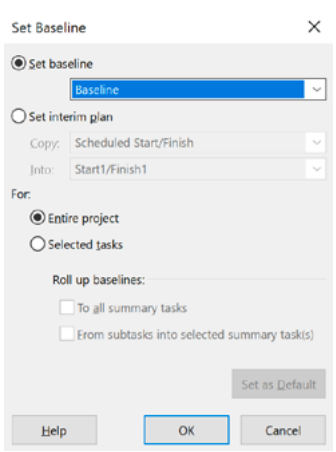
As part of the baseline, MS Project saves a copy of the current schedule, with the start and end dates of tasks, durations, entered effort and cost estimates etc.

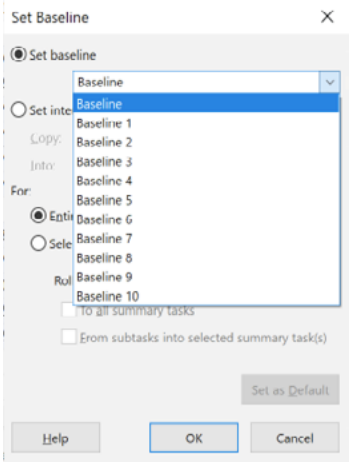
With the help of a baseline schedule, you can later compare your initial plan and budget against any changes you perform to the schedule and budget as the project progresses.

How to draw a baseline: *Choose Set Baseline* ...



You normally set the baseline for the entire project, but you can also choose selected tasks to be "baselined".





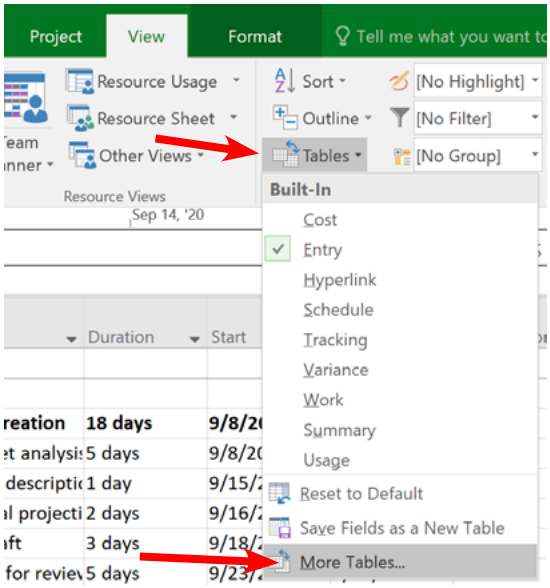
Choose the baseline version under which you want to save the baseline (for example *Baseline* or *Baseline 1*).

To learn how to compare your baseline against the actual schedule, see page 101.

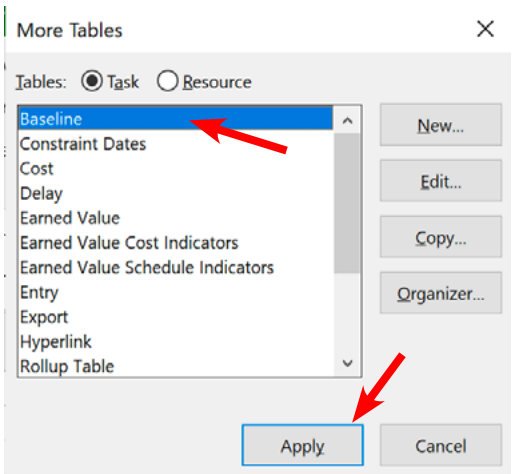
How can you view the baseline data?

Suppose you later want to check what original dates and costs were in your baseline, you can see the baseline data in the baseline table view.

To see the baseline data, go to *View* → *Tables* → *More Tables* ...



Choose *Baseline*:



Now you can see the baseline data with the original start and finish dates, work and cost:

GANTT CHART

	Task Name	Baseline Dur.	Baseline Start	Baseline Finish	Baseline Work
1					
2					
3	**Business plan creation**	**18 days**	**9/8/2020**	**10/1/2020**	**0 hrs**
4	Perform market analysis	5 days	9/8/2020	9/14/2020	0 hrs
5	Write product descriptio	1 day	9/15/2020	9/15/2020	0 hrs
6	Create financial projecti	2 days	9/16/2020	9/17/2020	0 hrs
7	Create first draft	3 days	9/18/2020	9/22/2020	0 hrs
8	Send to friend for reviev	5 days	9/23/2020	9/29/2020	0 hrs
9	Finalize business plan	2 days	9/30/2020	10/1/2020	0 hrs
10					
11	**Business license acquisit**	**9 days**	**9/8/2020**	**9/18/2020**	**0 hrs**
12	Gather required docume	1 day	9/8/2020	9/8/2020	0 hrs
13	Apply for business licens	1 day	9/9/2020	9/9/2020	0 hrs
14	Business license applica	7 days	9/10/2020	9/18/2020	0 hrs
15	Business license grantec	0 days	9/18/2020	9/18/2020	0 hrs
16					

Remember you can also have multiple baselines that you can compare your initial schedule against.

CHAPTER 12

Tracking progress of your project

As your project progresses, you want to keep your schedule updated so you can see what tasks were accomplished, what milestones were reached, how much of the budget has been spent and how much is left and so on.

To be able to do that, there are a number of features in Project that let you track the progress of a project. One is the progress bar setting that we are going to look at now.

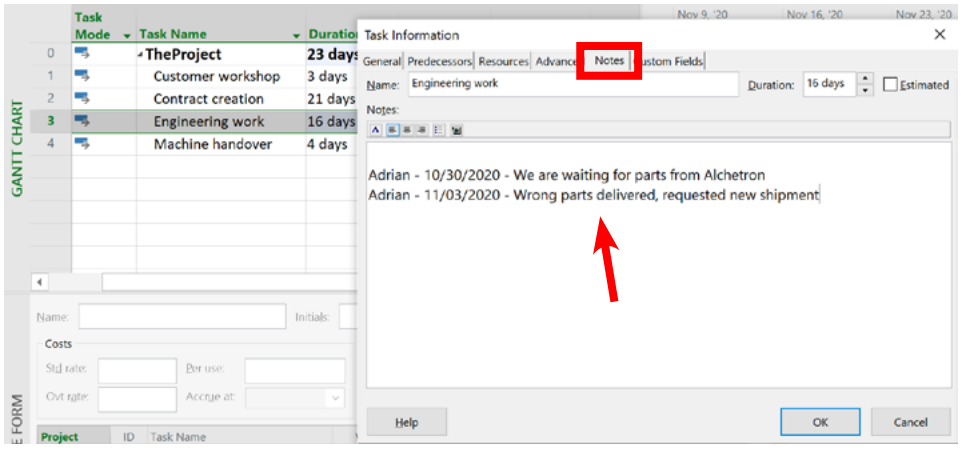
(In the chapter Tracking actual work and costs on page 80 I'll show you how to enter actual effort and costs.)

Before you make any updates on the progress level, please read the brief section I wrote about the status date (see page 80)!

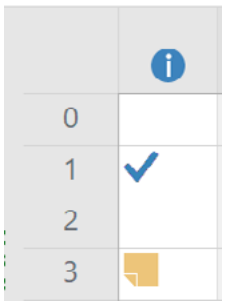
Use task notes to keep track of task status

One field I frequently use to help me remember the status of tasks is the notes field.

Click on the task and go to *Notes*. Here you can record all sorts of information on a specific task, including images. This makes it easy to catch up when you get back to work.



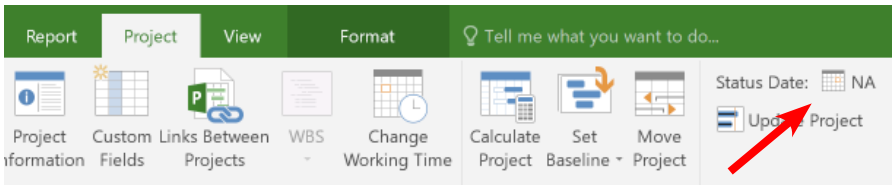
The task will have a notes icon:



Using the progress bar

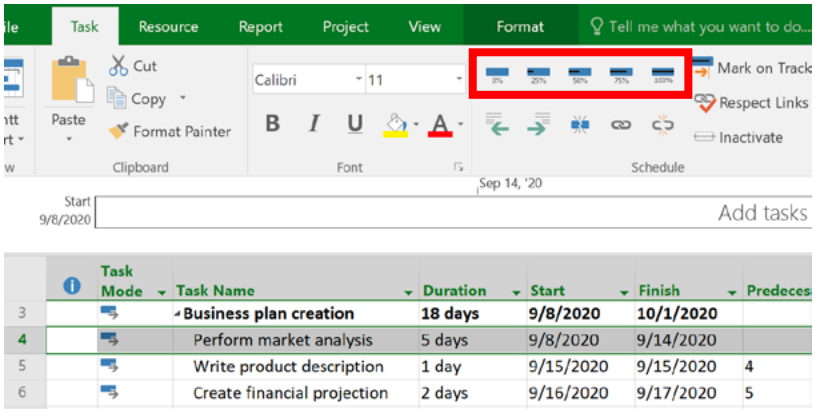
The primary way you can track the progress of your project is with the progress indicator. You can set for each task, how much % has been completed at a defined date.

By default, Microsoft Project uses your computer's current date for the progress entry, but you can also set a status date for which the progress should be recorded (for example, if it's already November but you want to track the progress per 31st of October.)



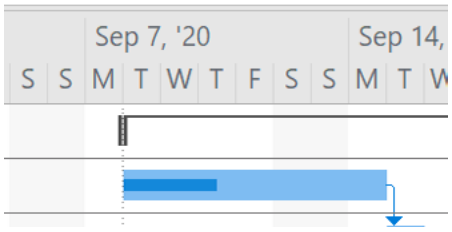
Now let's set the actual progress.

Select a task and choose the appropriate progress level: 0%, 25%, 50% and so on:

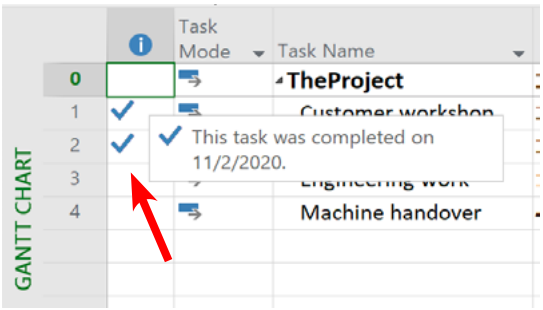


	Task Mode	Task Name	Duration	Start	Finish	Predeces
3		**Business plan creation**	**18 days**	**9/8/2020**	**10/1/2020**	
4		Perform market analysis	5 days	9/8/2020	9/14/2020	
5		Write product description	1 day	9/15/2020	9/15/2020	4
6		Create financial projection	2 days	9/16/2020	9/17/2020	5

The progress level will show as an overlay on the task bar:



Once a task is marked 100% complete, the following indicator will appear next to it:



Important: The progress indicator works on the basis of the task duration. This means if a task has a duration of 3 days and 1.5 days have been passed, the task is 50% complete

How the progress bar impacts your actual costs

One important remark about the progress indicator: The progress level is more than just a visual reference for your project's progress. If you change the indicator, **Project will recalculate your actual costs** (if you're using resources and costs, that is).

It will simply take the portion of the planned budget that should have been spent by now and show the amount in the *Actual Costs* column.

To make things clearer, take this example:

Task "*Perform market analysis*"	planned effort: 40 hours
	hourly rate: $70

At 50% progress	40 hours x $70 x 50% progress = $1,400
At 75 % progress	40 hours x $70 x 75% progress = $1,375
At 100% progress	40 hours x $70 x 100% progress = $2,800

Example of how the actual costs appear once the progress level is changed: The task *Contract creation* is 50% done, thus the actual cost is calculated as 50% of the planned budget (column *Cost*):

TASK USAGE

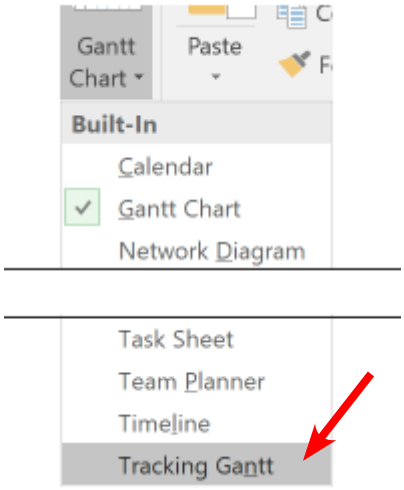
	Task Mode	Task Name	Work	Duration	Start	Finish	Cost	Actual Cost
		Airfare			*10/29/2020*	*11/2/2020*	*$2,400.00*	*$2,400.00*
		Accommodation			*10/29/2020*	*11/2/2020*	*$500.00*	*$500.00*
		Other travel expenses			*10/29/2020*	*11/2/2020*	*$200.00*	*$200.00*
2		*Contract creation*	*0 hrs*	*21 days*	*10/29/2020*	*11/26/2020*	*$2,750.00*	*$1,375.00*
		Legal advisor services			*10/29/2020*	*11/26/2020*	*$2,750.00*	*$1,375.00*
3		Engineering work	0 hrs	14 days	11/3/2020	11/20/2020	$0.00	$0.00
4		Machine handover	0 hrs	4 days	11/23/2020	11/26/2020	$0.00	$0.00

Tracking actual start and finish dates of tasks

In projects it's very uncommon that tasks stay within schedule. Sometimes tasks get delayed or in other cases they might finish early.

To keep your schedule up to date, you want MS Project to show the actual dates when a task was started or finished.

To enter the actual start and finish dates of a task, go to the *Tracking View*:



Enter the Actual Start and Actual Finish date, that is the dates when a task was actually started or completed.

TRACKING GANTT

	Task Name	Start	Finish	Actual Start	Actual Finish	Resource Names
0	**IT System Migration Project**	**12/1/2020**	**2/16/2021**	**12/1/2020**	**NA**	
1						
2	**Project setup**	**12/1/2020**	**1/13/2021**	**12/1/2020**	**NA**	
3	Create project organization	12/1/2020	12/14/2020	12/1/2020	12/14/2020	Felicia Sanchez[40
4	Create project schedule	12/14/2020	12/30/2020	12/14/2020	NA	Felicia Sanchez[60
5	Create budget	12/31/2020	1/7/2021	NA	NA	Felicia Sanchez[60
6	Create stakeholder list	1/8/2021	1/12/2021	NA	NA	Felicia Sanchez[60
7	Project kickoff	1/12/2021	1/13/2021	NA	NA	Felicia Sanchez[50
8						
9	**Concept phase**	**1/13/2021**	**2/16/2021**	**NA**	**NA**	
10	Requirements workshop	1/13/2021	1/18/2021	NA	NA	
11	Create requirement specs	1/18/2021	2/1/2021	NA	NA	
12	Create system specs	2/1/2021	2/10/2021	NA	NA	
13	Create migration concept	2/10/2021	2/16/2021	NA	NA	

CHAPTER 13

Tracking actual work and costs

In this chapter we'll look at how you record your actual project effort and expenses.

Please read first: Why the status date matters

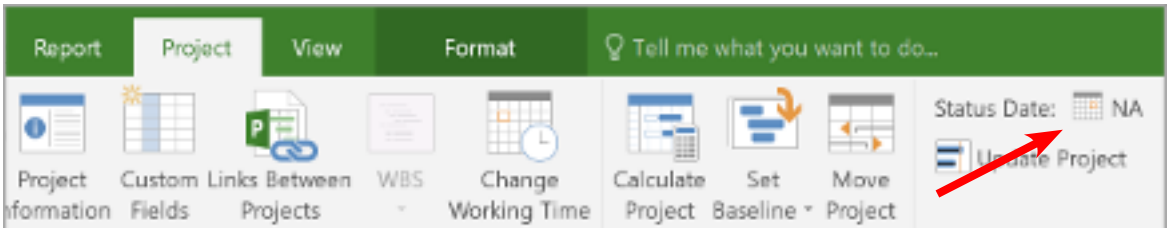
Before you start tracking actual costs or work, there's one important fact I want you to be aware of:

Microsoft Project tracks actual data on the basis of a specific **status date** for which those changes or updates became effective. By default, the status date is the current date and time at which you entered the actuals data. But you can also set a specific status date the actual data should be recorded for.

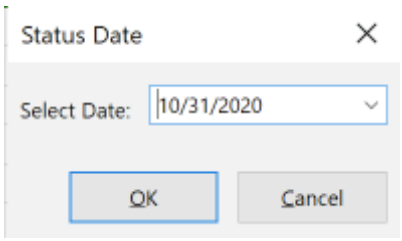
Example:

Suppose you are tracking actuals on a monthly basis. You sit down on the 7th of November to enter the actuals and progress data for the previous month, October. By default, Project would assume that these actuals became effective per 7th of November. However, this would be incorrect. To avoid such a mismatch in your numbers, you need to tell Project the status date for which your actual numbers should be recorded. (In our example, you would have to set the status date as 31st of October).

Here's how you can set the status date:



Enter the status date for which you want to make the update:

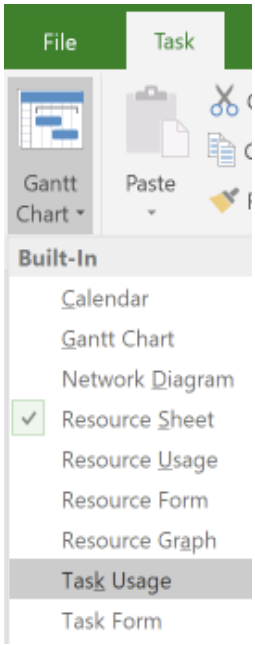


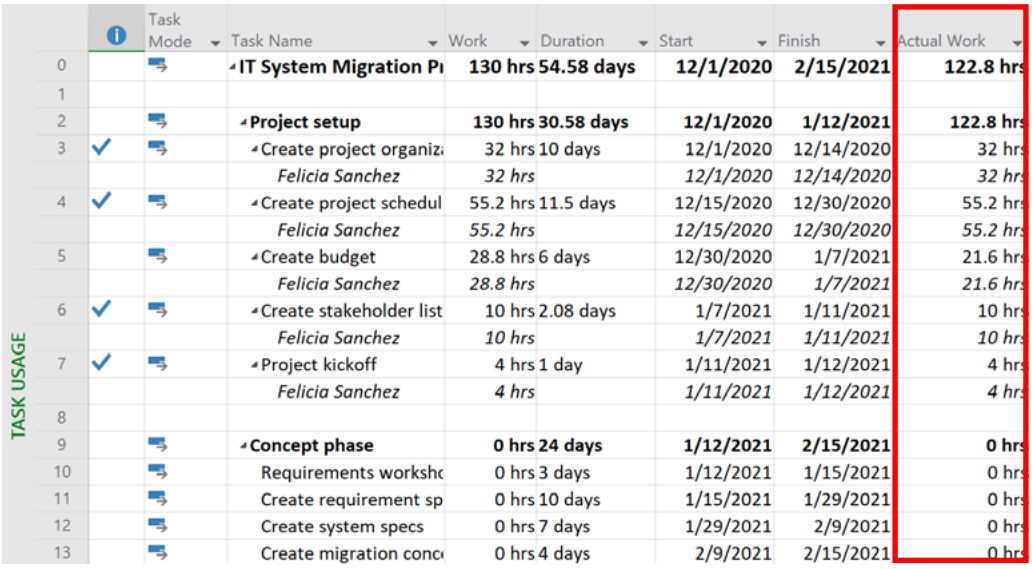
Now any actual costs or work numbers will be booked for 10/31/2020 as the effective date.

Tracking actual work (effort)

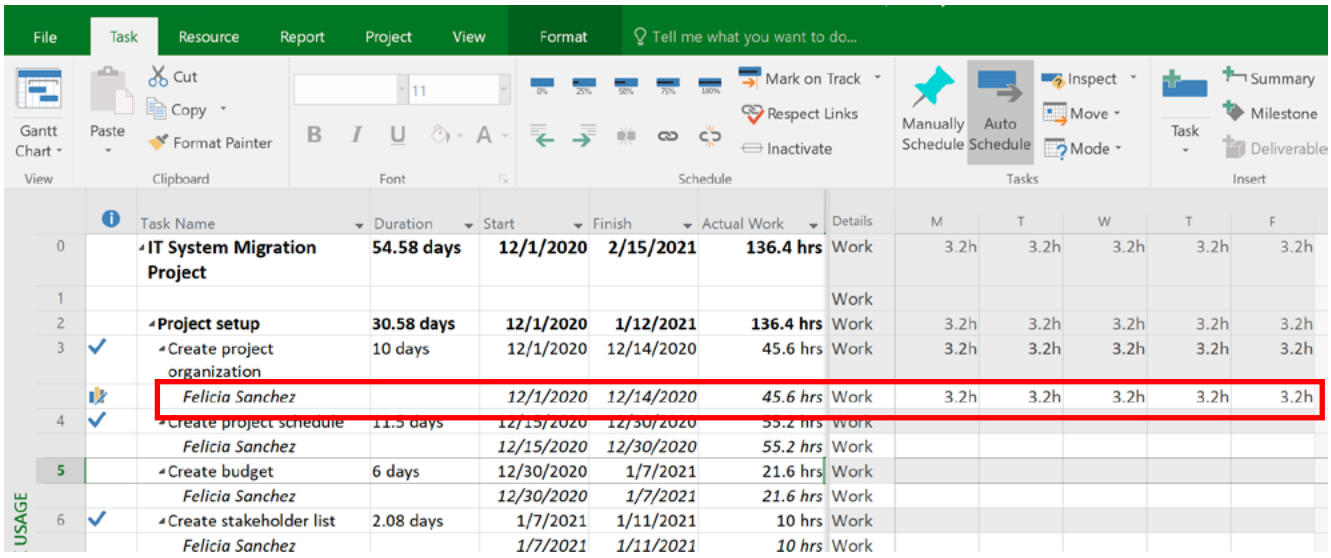
In this section you'll learn how to record the actual time your team members have spent on a task. You want to have this information in MS Project so you can always check if you are within the approved budget or not.

Tracking of actual work is done in the *Task Usage* view:



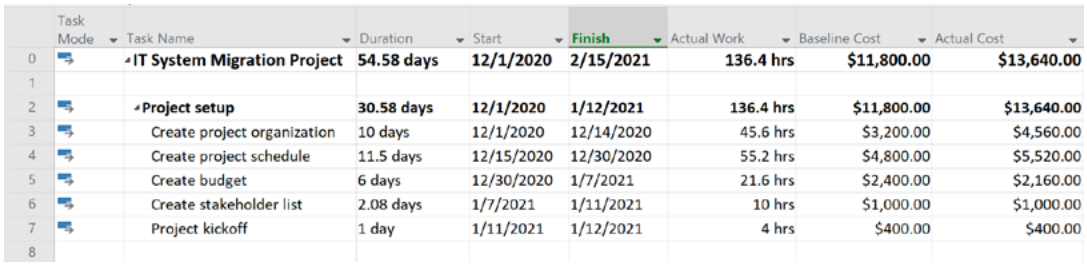


You should see the following screen: On the left your work breakdown structure with the tasks, on the right a calendar view:



Now, enter the actual working hours into the calendar view (into the white editable rows). The rows indicate how much a specific resource (in our example Felicia Sanchez) has worked on a task.

After you've made the update, the entered work will also appear in the Gantt view:



	Task Mode	Task Name	Duration	Start	Finish	Actual Work	Baseline Cost	Actual Cost
0		**IT System Migration Project**	**54.58 days**	**12/1/2020**	**2/15/2021**	**136.4 hrs**	**$11,800.00**	**$13,640.00**
1								
2		**Project setup**	**30.58 days**	**12/1/2020**	**1/12/2021**	**136.4 hrs**	**$11,800.00**	**$13,640.00**
3		Create project organization	10 days	12/1/2020	12/14/2020	45.6 hrs	$3,200.00	$4,560.00
4		Create project schedule	11.5 days	12/15/2020	12/30/2020	55.2 hrs	$4,800.00	$5,520.00
5		Create budget	6 days	12/30/2020	1/7/2021	21.6 hrs	$2,400.00	$2,160.00
6		Create stakeholder list	2.08 days	1/7/2021	1/11/2021	10 hrs	$1,000.00	$1,000.00
7		Project kickoff	1 day	1/11/2021	1/12/2021	4 hrs	$400.00	$400.00
8								

The *Actual Work* shown is the total of hours spent on a task until now.

Notice I have also shown the *Actual Cost*. This is the cost representation of the hours that were spent. MS Project simply multiplies the actual working hours with the standard rate you entered in the *Resource Sheet*. I'm also showing the Baseline Cost, that is the cost estimation from our initial project plan.

Tracking actual material costs

MS Project enables you to track consumption of materials on a quantitative level. For example, you can track how many square feet of marble tiles, tons of cement or bricks have been used in a project. To be able to track material consumption and the corresponding costs, you must have set up one or more material resources in the Resource Sheet.

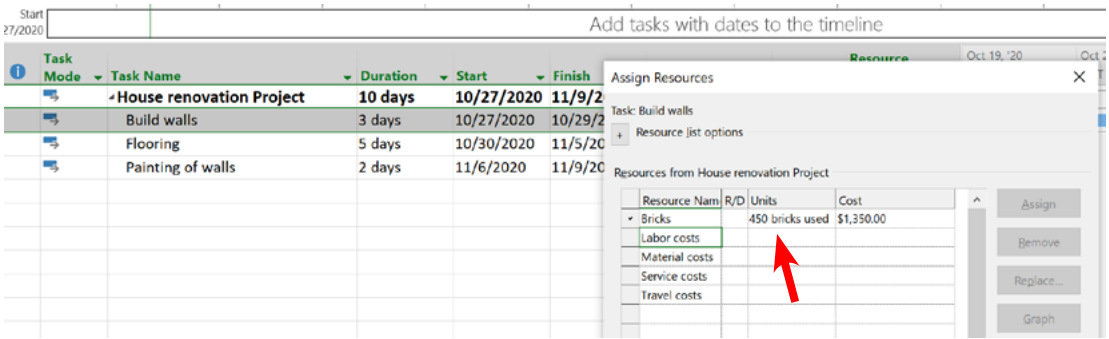
As an example, I have set up “bricks” as a material resource. The cost per brick is $3:

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue
1	Material costs	Cost		M	MaterialCostGroup					Prorated
2	Labor costs	Cost		L	LaborCostGroup					Prorated
3	Service costs	Cost		S	ServiceCostGroup					Prorated
4	Travel costs	Cost		T	TravelCostGroup					Prorated
5										
6	Bricks	Material	bricks used	B	MaterialCostGroup		$3.00		$0.00	Prorated

Note what I have entered in each column. For the column ”Material”, the full title is actually “Material label”, and this is where you typically enter the unit of measure such as bricks, kilograms or whatever units you are working with.

Besides having material resources set up, you also must have assigned them to the tasks where they are going to be used.

Assign the material resource to the task: In this case we plan to use 450 bricks at a cost of $3 each. That is $1,350 in planned costs for bricks:



Now, during your project the following may happen:

1. Your actual consumption is lower (or higher) than estimated: You’re using fewer or more units as planned. Let’s say you had a contingency 20 bricks in your budget because some of the bricks might have flaws or get broken during construction.

2. Your actual per-unit costs changes: For example, you have estimated that one brick costs

$3.00, but eventually you got a better deal and were able to purchase them for $2.50 per brick.

3. A combination of both: real material costs are different from estimated ones, and the quantity used differs from the planned quantity.

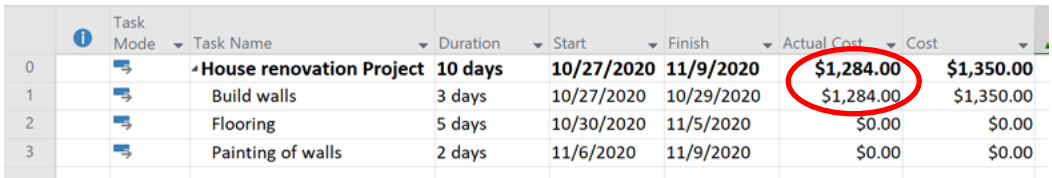
Here's how you can handle these cases in MS Project:

To record the real quantity of material consumed:

Go to the *Task Usage* view and enter the actual units into the *Actual Work* column:

	Task Mode	Task Name	Work	Duration	Start	Finish	Budget Cost	Actual Work
0		**House renovation Proj**	**0 hrs**	**10 days**	**10/27/2020**	**11/9/2020**	**$107,000.00**	**0 hrs**
		Material costs			*NA*	*NA*	*$70,000.00*	
		Labor costs			*NA*	*NA*	*$20,000.00*	
		Service costs			*NA*	*NA*	*$10,000.00*	
		Travel costs			*NA*	*NA*	*$7,000.00*	
1		Build walls	0 hrs	3 days	10/27/2020	10/29/2020		0 hrs
		Bricks	*bricks used*		*10/27/2020*	*10/29/2020*		*428 bricks used*
2		Flooring	0 hrs	5 days	10/30/2020	11/5/2020		0 hrs
3		Painting of walls	0 hrs	2 days	11/6/2020	11/9/2020		0 hrs

If you go back to the Gantt view, you'll see the actual costs are now shown for the real number of bricks we have used. The *Cost* column shows the estimated costs:



	Task Mode	Task Name	Duration	Start	Finish	Actual Cost	Cost
0		**House renovation Project**	**10 days**	**10/27/2020**	**11/9/2020**	**$1,284.00**	**$1,350.00**
1		Build walls	3 days	10/27/2020	10/29/2020	$1,284.00	$1,350.00
2		Flooring	5 days	10/30/2020	11/5/2020	$0.00	$0.00
3		Painting of walls	2 days	11/6/2020	11/9/2020	$0.00	$0.00

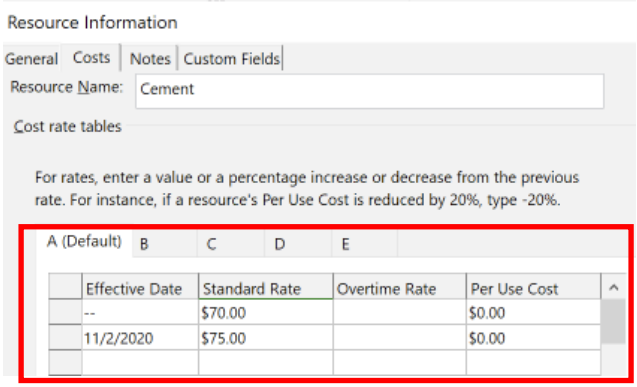
But hey, what if material prices have changed? Suppose you planned to buy 100 bags of cement at $70 per bag but then when you raised the order the price had gone up to $75.

How do you account for this price difference? Here's the proper way to handle price changes:

Step 1: You create your schedule based on the estimated material price ($70) (You create a material resource with a unit price of $70)

Step 2: You take the baseline of your original schedule. As part of the baseline, MS Project will "remember" the start and end dates of tasks, but also the quantities and cost rates you've used for the initial plan (see chapter Taking the baseline of your schedule about baselines).

Step 3: When the material price goes up, go to the resource sheet (see page 47) and change the material rate (in this case from $70 to $75). Note: You can also define time-dependent rates for resources:



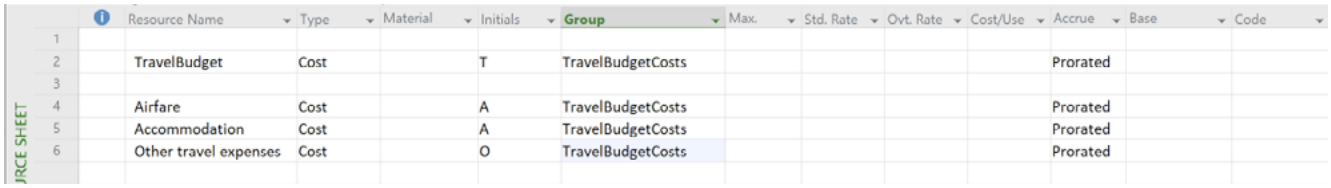
Step 4. When you do a plan/actual comparison for your costs, you have to compare the actual schedule against the baseline schedule you created in step 2.

Tracking actual travel expenses

To be able to record travel expenses, you must have done the following:

- Create a project budget (see chapter Entering a planned budget). You can either define one single big budget or separate budgets for each cost type (material, travel etc.).
- Create cost resources for each travel cost item (airfare, hotel, car rental etc.)

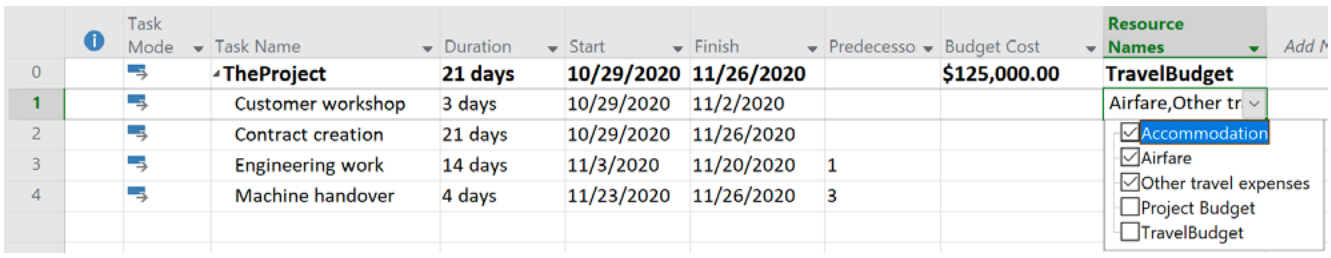
Below you see an example of a resource sheet with travel-related resources needed for tracking travel expenses. I have defined one total travel budget resource for the entire project. This resource will store your travel budget estimate. I have also defined 3 cost resources for airfare, accommodation and other travel expenses. These cost resources are where we'll book our actual expenses against.



	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
1												
2	TravelBudget	Cost		T	TravelBudgetCosts					Prorated		
3												
4	Airfare	Cost		A	TravelBudgetCosts					Prorated		
5	Accommodation	Cost		A	TravelBudgetCosts					Prorated		
6	Other travel expenses	Cost		O	TravelBudgetCosts					Prorated		

You must have assigned the cost resources – in this case Airfare, Accommodation and Other travel expenses – to the tasks where traveling is involved.

In this example, I have assigned the resources to the customer workshop task:

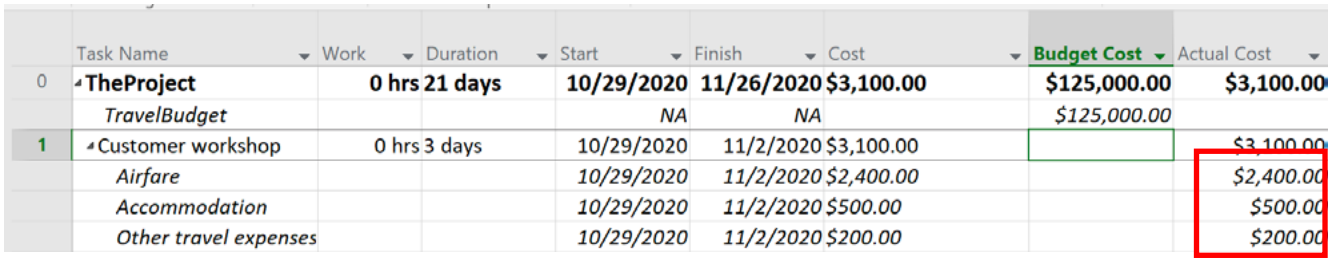


	Task Mode	Task Name	Duration	Start	Finish	Predecesso	Budget Cost	Resource Names
0		**TheProject**	**21 days**	**10/29/2020**	**11/26/2020**		**$125,000.00**	**TravelBudget**
1		Customer workshop	3 days	10/29/2020	11/2/2020			Airfare,Other tr
2		Contract creation	21 days	10/29/2020	11/26/2020			
3		Engineering work	14 days	11/3/2020	11/20/2020	1		
4		Machine handover	4 days	11/23/2020	11/26/2020	3		

Accommodation
Airfare
Other travel expenses
Project Budget
TravelBudget

Now, let's say as part of the customer workshop, we have incurred travel expenses of $2400 for plane tickets, $500 for our hotel stay and $200 for our rented car.

To record these values, go to the Task Usage view and enter the amount into the *Actual Cost* column:

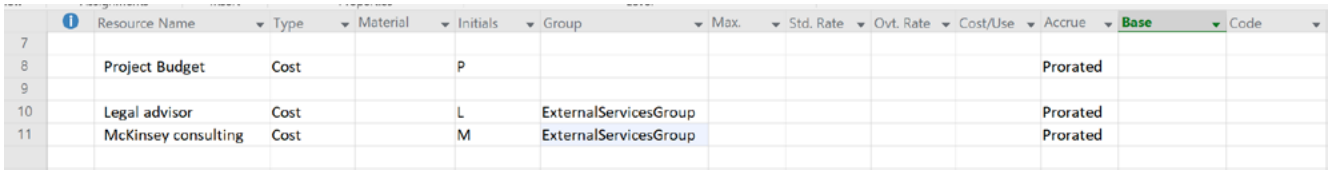


	Task Name	Work	Duration	Start	Finish	Cost	Budget Cost	Actual Cost
0	**TheProject**	**0 hrs**	**21 days**	**10/29/2020**	**11/26/2020**	**$3,100.00**	**$125,000.00**	**$3,100.00**
	TravelBudget			*NA*	*NA*		*$125,000.00*	
1	Customer workshop	0 hrs	3 days	10/29/2020	11/2/2020	$3,100.00		$3,100.00
	Airfare			*10/29/2020*	*11/2/2020*	*$2,400.00*		*$2,400.00*
	Accommodation			*10/29/2020*	*11/2/2020*	*$500.00*		*$500.00*
	Other travel expenses			*10/29/2020*	*11/2/2020*	*$200.00*		*$200.00*

Track service costs and other actual costs

To be able to record other actual cost items like service or insurance costs (or whatever you work with in the project), you need to create a cost resource for each cost item.

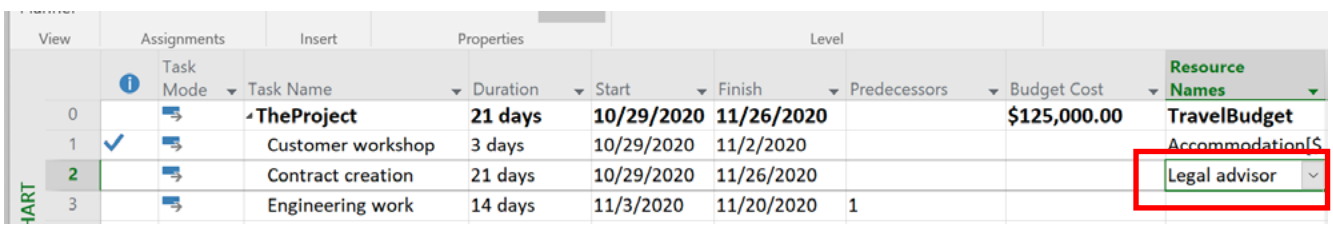
Look at the example, where I have created a number of other cost resources:



	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code
7												
8	Project Budget	Cost		P						Prorated		
9												
10	Legal advisor	Cost		L	ExternalServicesGroup					Prorated		
11	McKinsey consulting	Cost		M	ExternalServicesGroup					Prorated		

They all are external services we are using in a project, and they are set up as cost resources. Why? Because we don't care about the number of hours they put into the project, but about the final amount they are going to bill us.

Now, assume our legal advisor sends us an invoice over $2,750 for creating a contract. He has been assigned as a resource to the task *Contract creation*:



	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Budget Cost	Resource Names
0		**TheProject**	**21 days**	**10/29/2020**	**11/26/2020**		**$125,000.00**	**TravelBudget**
1	✓	Customer workshop	3 days	10/29/2020	11/2/2020			Accommodation[$
2		Contract creation	21 days	10/29/2020	11/26/2020			Legal advisor
3		Engineering work	14 days	11/3/2020	11/20/2020	1		

To record the actual amount, go to the *Task Usage* view and column Actual Cost:

TASK USAGE

	Task Mode	Task Name	Work	Duration	Start	Finish	Cost	Budget Cost	Actual Cost
0		**TheProject**	**0 hrs**	**21 days**	**10/29/2020**	**11/26/2020**	**$5,850.00**	**$125,000.00**	**$5,850.00**
		TravelBudget			*NA*	*NA*		*$125,000.00*	
1	✓	Customer workshop	0 hrs	3 days	10/29/2020	11/2/2020	$3,100.00		$3,100.00
		Airfare			*10/29/2020*	*11/2/2020*	*$2,400.00*		*$2,400.00*
		Accommodation			*10/29/2020*	*11/2/2020*	*$500.00*		*$500.00*
		Other travel expenses			*10/29/2020*	*11/2/2020*	*$200.00*		*$200.00*
2	✓	Contract creation	0 hrs	21 days	10/29/2020	11/26/2020	$2,750.00		$2,750.00
		Legal advisor			*10/29/2020*	*11/26/2020*	*$2,750.00*		*$2,750.00*
3		Engineering work	0 hrs	14 days	11/3/2020	11/20/2020	$0.00		$0.00
4		Machine handover	0 hrs	4 days	11/23/2020	11/26/2020	$0.00		$0.00

CHAPTER 14

Handling common project situations in MS Project

During a project you usually have to deal with all kinds of challenging situations and changes that can have an impact on your schedule and costs. In this chapter, I'll show you the right way to handle the most common situations with MS Project.

What to do when tasks get delayed

If a task gets delayed, this might have an impact on your schedule. Therefore, we need to show this delay in MS Project and check how it will affect your original schedule.

What parameter should you change to show the delay?

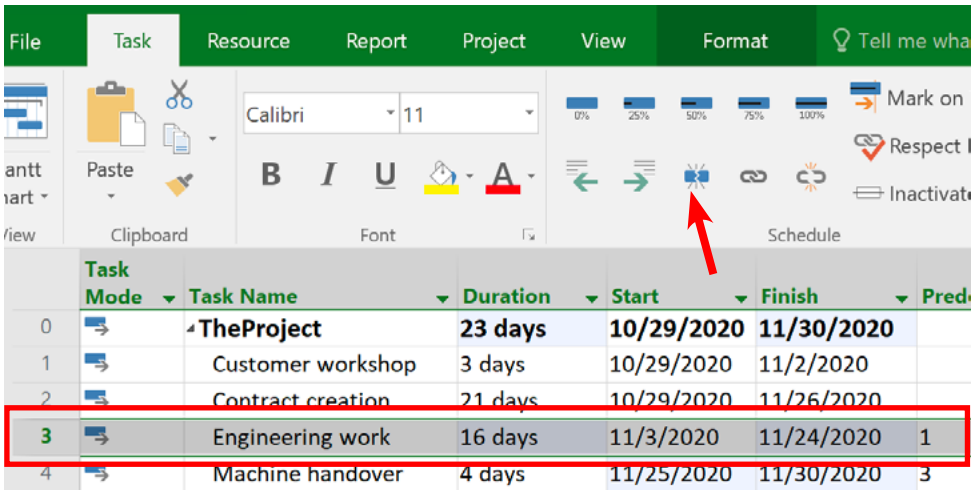
This depends on what has caused the delay.

Scenario 1: The task required more work to complete

In this case, just drag the end of the Gantt bar to the new estimated finish date.

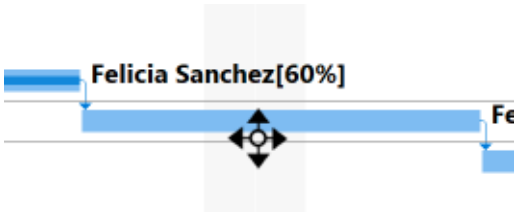
Scenario 2: The assigned resource has been unavailable

In this case, split the task into the original task and the delayed part. Splitting a task simply means that work for the task will take place at different dates. Use the split task button for this:



Scenario 3: The whole task been delayed (shifted) for various reasons

This could be because one of the earlier tasks got delayed, and now the task in question also has to be “moved” to a new finish date. In this case, simply click on the center of the task bar and move it to the new estimated start date / end date:



Showing tasks that finished early

This is done in the *Tracking View*. I show you how to do it on page 78

How to handle change requests

In every project you'll have to deal with unexpected changes. These changes – which are normally handled as change requests (or change orders) – require additional work and funds for their implementation.

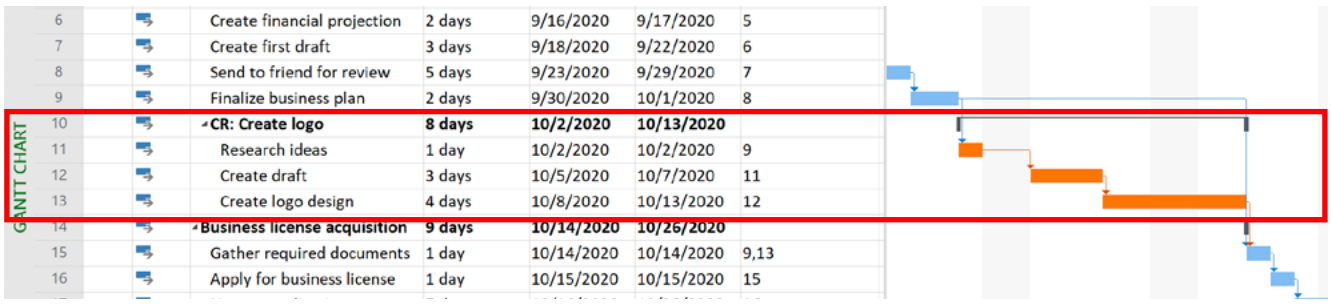
How should you enter such changes in MS Project so that you're still able to distinguish originally planned work from the "extra" work from the change request?

Step 1: Enter the additional tasks as regular tasks into your schedule

Add the additional tasks in the same way you would include regular work. That means linking the new tasks with the existing tasks, adding resources, apply constraints if there are any and so on.

You can see I'm using different colors to visually separate work from change request (right-click on the task bar to change its color).

I've also grouped the additional work under a summary task called "CR: Create logo". (CR stands for change request):



Step 2: Analyze the impact of the change

If you've correctly entered the task for the change request and done all the linking with other tasks, you may notice that the project end date (as well as the finish dates of other tasks) have changed.

This would be the case if there's not enough "buffer" (or float), which would allow you to increase work without impacting the final project delivery date.

Spend some time to understand how the change order has affected your schedule and make adjustments to the change order-related tasks to better fit in the extra work (for example, maybe some tasks can run parallel?)

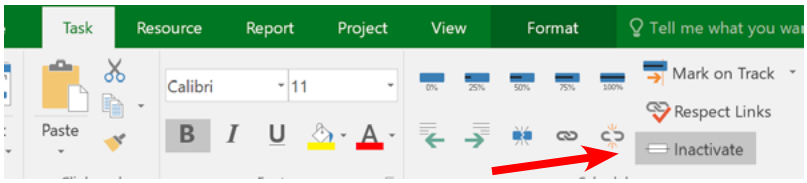
Step 3: Easily switch back to the original schedule

It would get confusing if all the scope changes were now in your schedule and you couldn't easily see what the original schedule looked like. The good news is: You can easily switch back to the original schedule (before the change request).

You can simply inactivate the tasks for the change request, and this will take you back to your original schedule. Just mark the relevant summary task or list of tasks:

		Task Name	Duration	Start	Finish	Predecessors
	9	Finalize business plan	2 days	9/30/2020	10/1/2020	8
GANTT CHART	10	**CR: Create logo**	**8 days**	**10/2/2020**	**10/13/2020**	
	11	Research ideas	1 day	10/2/2020	10/2/2020	9
	12	Create draft	3 days	10/5/2020	10/7/2020	11
	13	Create logo design	4 days	10/8/2020	10/13/2020	12

Then, from the Task ribbon press *Inactivate*:



Now the change order work appears struck through and the task bars are greyed out. You are back at your original schedule with the original delivery date.

		Task Name	Duration	Start	Finish	Predecessors
10		~~CR: Create logo~~	~~8 days~~	~~10/2/2020~~	~~10/13/2020~~	
11		~~Research ideas~~	~~1 day~~	~~10/2/2020~~	~~10/2/2020~~	~~9~~
12		~~Create draft~~	~~3 days~~	~~10/5/2020~~	~~10/7/2020~~	~~11~~
13		~~Create logo design~~	~~4 days~~	~~10/8/2020~~	~~10/13/2020~~	~~12~~

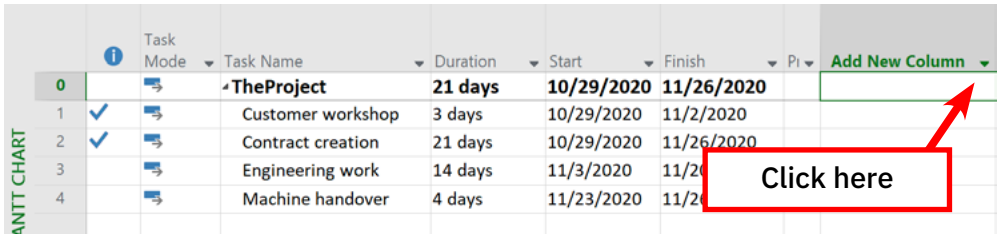
Use the activate / inactivate feature to compare the changed schedule with the original one, and gradually improve your new schedule so that the change order doesn't negatively impact the project delivery.

Reporting made easy

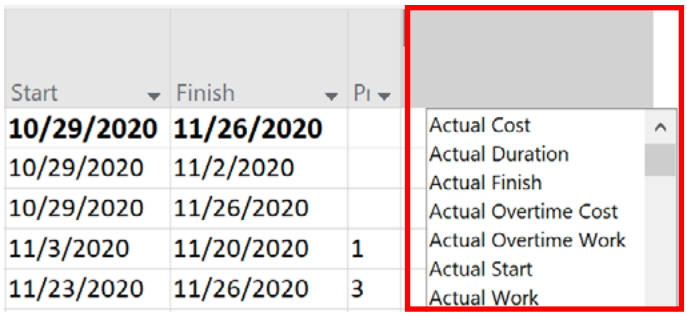
What's the meaning of the different data fields?

MS Project tracks a large amount of data about costs, timeline and work. Therefore it can be tricky to find the information you are looking for.

Here's a list of the most important fields that are useful for monitoring the status of your project. You can display the fields by adding the wanted column:

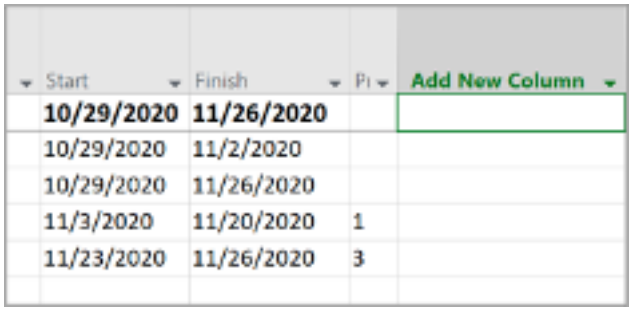


Select the field you want to show:



Field	What information is stored
Start	Start date of a task (current estimate)
Actual Start	Actual start date of a task When a task was really started
Finish	Finish date of a task (current estimate)
Actual Finish	Actual finish date of a task *When a task was really completed*
Duration	The time between the finish and start date of a task
Actual Duration	In simple terms, it is the time that has passed on a task so far since it was started. Actual duration is based on the progress level you have entered for the task. Example: A task has a duration of 10 days. It is marked at 75% complete. Actual duration is 7.5 days (10 days x 0.75)
Cost	Total scheduled cost
Actual Cost	Costs incurred for work performed until now, including costs for people, equipment and other resources.
Work	Estimated amount of work (it may change in the course of your project)
Actual Work	The amount of work that your resources have put into a task so far. *Note: If you take Actual Work and add Remaining Work you get the value for Work (the total amount of work)*
Remaining Work	The remaining amount of work that is necessary to complete a task.

There are quite a few more key figures tracked in Project, and I recommend you take a look at them. You can see the full list by clicking *Add New Column*:



Start	Finish	Pr	Add New Column
10/29/2020	**11/26/2020**		
10/29/2020	11/2/2020		
10/29/2020	11/26/2020		
11/3/2020	11/20/2020	1	
11/23/2020	11/26/2020	3	

You can find a complete overview of fields on the Microsoft website (click to open).

Baseline values

In addition to the parameters listed above, Project also stores baseline version of these parameters –that is, snapshots from earlier schedule versions – in a separate table.

This way you can always compare your current schedule parameters against previous parameter values.

These baseline values are named according to the following logic:

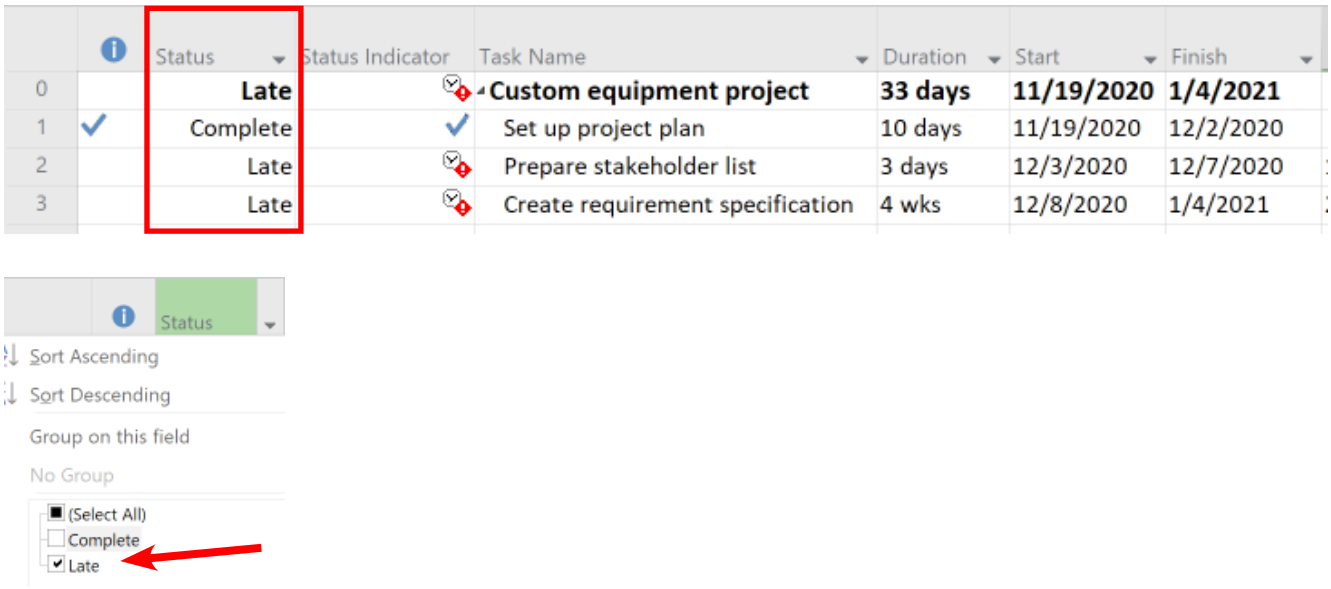
For example: *Baseline 1-10 Work:* This shows the total amount of projected work in your baseline number n where n is the number of the baseline you are looking at.

Which tasks are delayed?

Pay attention to tasks which are behind schedule.

'*Behind schedule*' in Project means that we are already passed a task's finish date and the task hasn't been marked as Completed using the progress indicator.

To see which tasks are delayed, open the Gantt view, show the Status column and filter by 'Late':

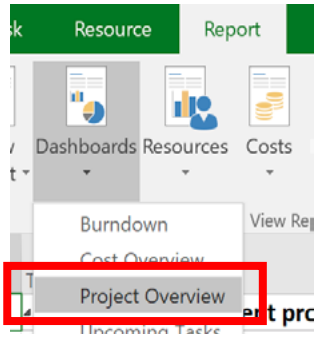


		Status	Status Indicator	Task Name	Duration	Start	Finish
0		**Late**		**Custom equipment project**	**33 days**	**11/19/2020**	**1/4/2021**
1	✓	Complete	✓	Set up project plan	10 days	11/19/2020	12/2/2020
2		Late		Prepare stakeholder list	3 days	12/3/2020	12/7/2020
3		Late		Create requirement specification	4 wks	12/8/2020	1/4/2021

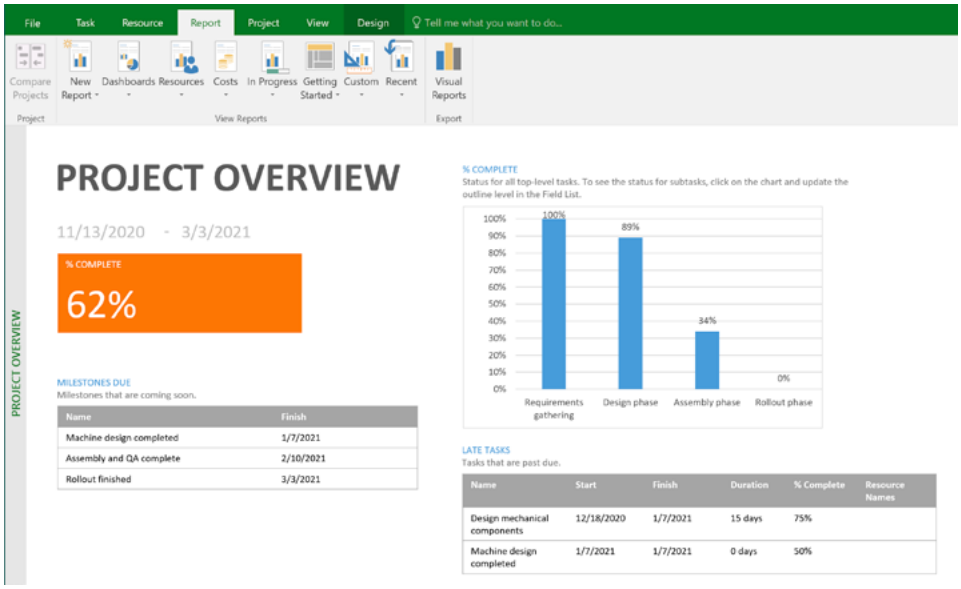
Creating a high-level status report

The project overview report is useful for high-level management reporting. You want to show the project key dates, the upcoming milestones and tasks which are delayed. The nice thing is you can customize your reports in MS Project to show exactly information you want.

To create the overview report, do the following:



You should now see the project overview report, which should look somewhat like this (note: I'm using MS Project 2016):



Milestones due: These are <u>all</u> milestones which are not yet complete (% Work Complete < 100%), regardless of when they are scheduled. Remember that milestones are simply tasks which have their duration set to 0 (zero).

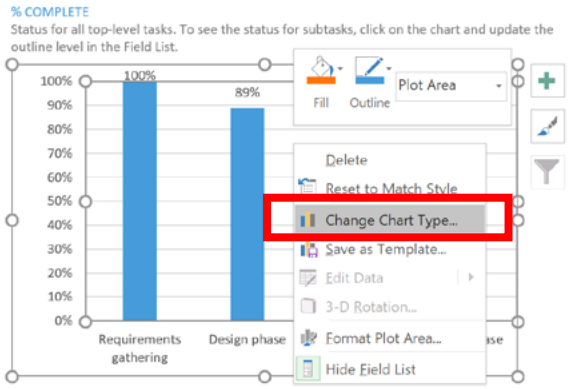
Late tasks: These are tasks which have the statues Late in the Gantt chart. They are not yet 100% complete and the due date lies in the past.

On the next page I show you how to customize the report and add the data you need:

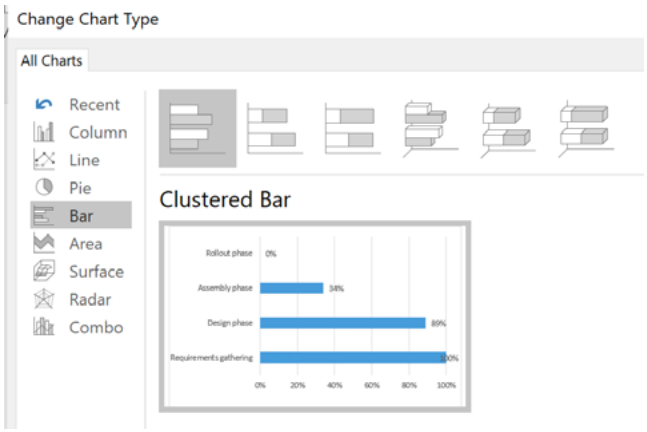
How to customize the overview report

Most likely, the default report doesn't exactly look the way you want. Let me show you several ways to customize it for your needs:

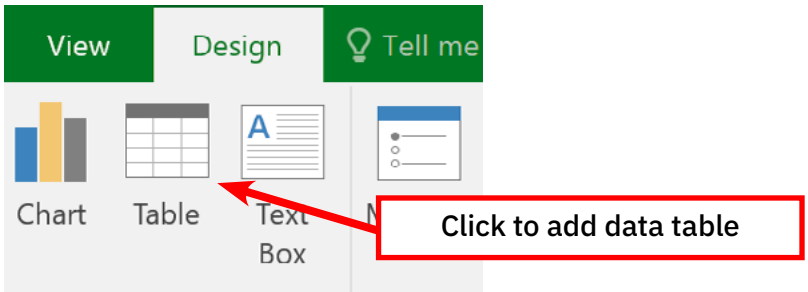
Changing the chart styles: In my case, I want the tasks in the status overview to be shown vertically instead of across. Just right-click on the chart and choose *Change Chart Type*:



Next, select the chart type you want and press *OK*:



Adding further project data: Let's say you want to show also the work effort by department. Executives often request this kind of breakdown. We will show the estimated effort against the real hours spent for each department. Here's how to add this data:

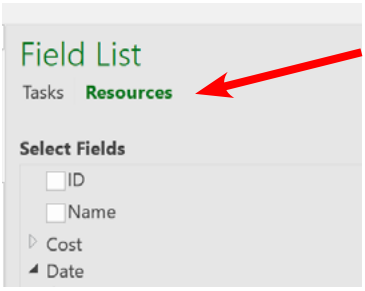


A new table will appear which will look somewhat like this:

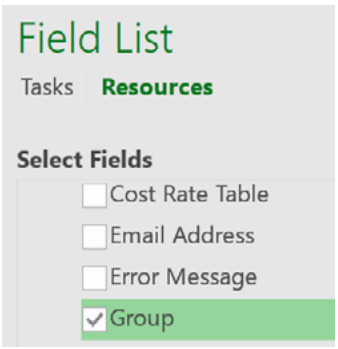
Name	Start	Finish	% Complete
Machine development project	11/13/2020	3/3/2021	57%

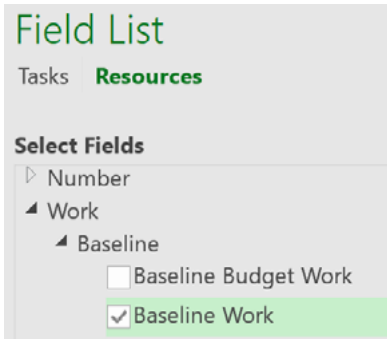
This is not yet the data we want to show. We need to select the fields we want from the Field List menu that has appeared on the right side of the screen.

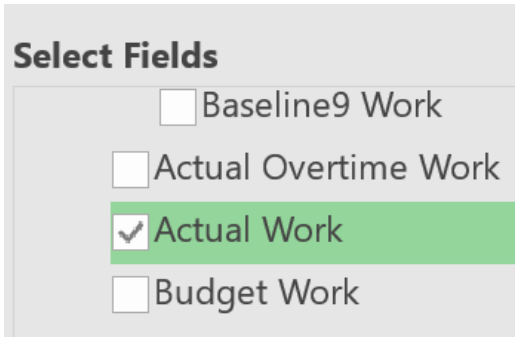
As we want to show **resource data** (work), we need to choose *Resources* in the Field List:



Then, choose the fields you want to show. In this case, we want to show *Group*. This is a field in the Resource Sheet where I've put the department that a resource belongs to.







Select also *Baseline Work*, where our initial work estimate is stored. Then, choose *Actual Work*, which contains the real hours your resources have worked.

Finally, we only want to include **work resources** in our report, not cost resources like the project budget. Therefore, we need to set the following filter for *Resources – Work*:

Voilà, here is our department breakdown:

Group	Baseline Work	Actual Work
Project engineering	168 hrs	42 hrs
Mechanical Engineering	40 hrs	38 hrs
Mechanical Engineering	64 hrs	64 hrs
Engineering Support Mexico	40 hrs	39 hrs
Electrical Engineering	64 hrs	64 hrs
Project delivery support	120 hrs	0 hrs

Now you can just go to this report once a month to pull up the latest work statistics.

Comparing the actual schedule against your initial schedule

While your project is moving along, you occasionally want to check your performance:

- Are you still within schedule?
- Did your team members have to invest more hours into their work or have your estimates turned out to be pretty accurate?
- Are you still within budget or have you spent more money than what you should have by now?

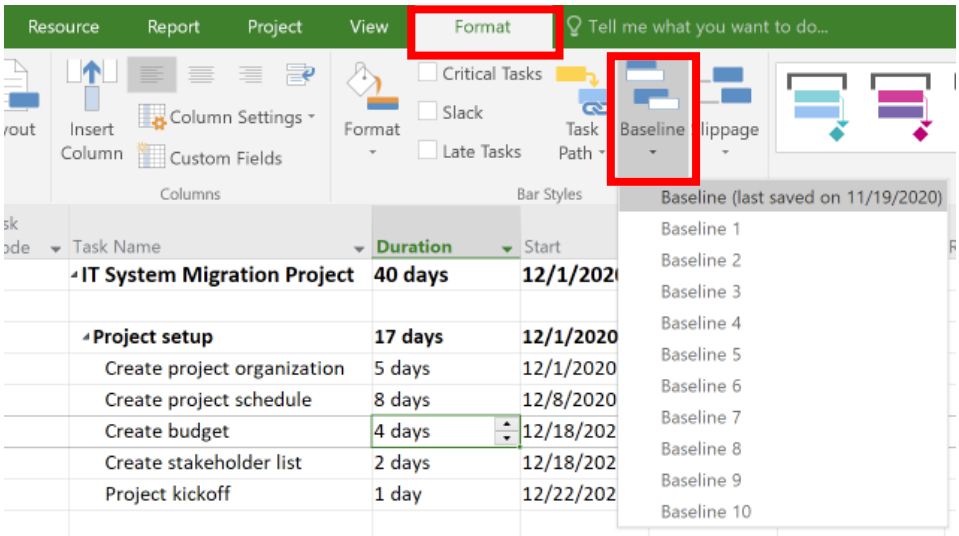
These are the kinds of analyses we'll be looking at now.

In order to be able to conduct such analysis, you need to have taken a baseline of your initial project schedule. A baseline is basically a snapshot of all the defined dates, resources, cost of your project at a certain point in time (See chapter Taking the baseline of your schedule where I explain how to create baselines).

With a stored baseline, you can compare your current schedule (with its delays and other time or resource changes you made) against the initial schedule.

Actual timeline vs. the initial timeline

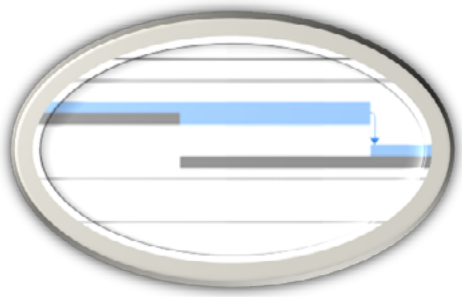
Let's put up the actual against the initial schedule in the Gantt chart view.



Go to the *Format* tab and click on the baseline under which your initial schedule was saved.

This will load the initial baseline schedule into your current view:

Task Mode	Task Name	Duration	Start	Finish	Predecess
	IT System Migration Project	**40 days**	**12/1/2020**	**1/25/2021**	
	Project setup	**17 days**	**12/1/2020**	**12/23/2020**	
	Create project organization	5 days	12/1/2020	12/7/2020	
	Create project schedule	8 days	12/8/2020	12/17/2020	3
	Create budget	4 days	12/18/2020	12/23/2020	4
	Create stakeholder list	2 days	12/18/2020	12/21/2020	4
	Project kickoff	1 day	12/22/2020	12/22/2020	6
	Concept phase	**24 days**	**12/23/2020**	**1/25/2021**	
	Requirements workshop	3 days	12/23/2020	12/25/2020	7
	Create requirement specs	10 days	12/28/2020	1/8/2021	10
	Create system specs	7 days	1/11/2021	1/19/2021	11
	Create migration concept	4 days	1/20/2021	1/25/2021	12



In the above screen, you can see the initial schedule (dark grey bars) and the actual schedule (blue bars) side-by-side:

Note: The colors may be different depending on the version of MS Project you are using.

Actual amount of work vs. planned amount of work

You can also compare the hours you and your team have spent on work versus hours planned.

In this example, I am comparing the planned work from initial schedule (stored in the baseline) against the actual amount of work:

	Task Name	Duration	Start	Finish	Work	Baseline Work
0	**IT System Migration Project**	**54.58 days**	**12/1/2020**	**2/15/2021**	**130 hrs**	**118 hrs**
1						
2	**Project setup**	**30.58 days**	**12/1/2020**	**1/12/2021**	**130 hrs**	**118 hrs**
3	Create project organization	10 days	12/1/2020	12/14/2020	32 hrs	32 hrs
4	Create project schedule	11.5 days	12/15/2020	12/30/2020	55.2 hrs	48 hrs
5	Create budget	6 days	12/30/2020	1/7/2021	28.8 hrs	24 hrs
6	Create stakeholder list	2.08 days	1/7/2021	1/11/2021	10 hrs	10 hrs
7	Project kickoff	1 day	1/11/2021	1/12/2021	4 hrs	4 hrs
8						

Comparing true costs vs. baseline cost

		Task Mode	Task Name	Duration	Start	Finish	Cost	Baseline Cost
0			**IT System Migration Project**	**54.58 days**	**12/1/2020**	**2/15/2021**	**$13,000.00**	**$11,800.00**
1								
2	✓		**Project setup**	**30.58 days**	**12/1/2020**	**1/12/2021**	**$13,000.00**	**$11,800.00**
3	✓		Create project organization	10 days	12/1/2020	12/14/2020	$3,200.00	$3,200.00
4	✓		Create project schedule	11.5 days	12/15/2020	12/30/2020	$5,520.00	$4,800.00
5	✓		Create budget	6 days	12/30/2020	1/7/2021	$2,880.00	$2,400.00
6	✓		Create stakeholder list	2.08 days	1/7/2021	1/11/2021	$1,000.00	$1,000.00
7	✓		Project kickoff	1 day	1/11/2021	1/12/2021	$400.00	$400.00
8								

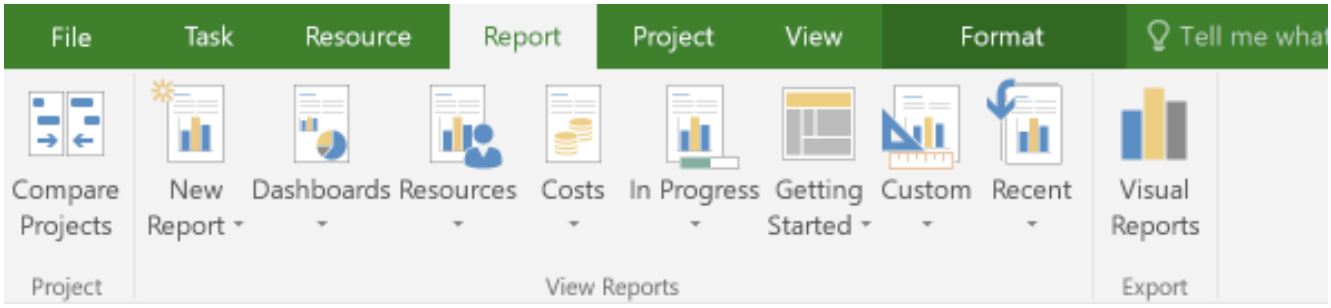
How much cost did we incur so far, and how much should we have spent as per our initial schedule? This we can see by showing the *Cost* columns (I loaded the baseline data):

These are just examples to show you how you can compare your current schedule against the initial schedule to see if you are in the "green zone". There are many other comparisons you can do using the baseline data for the fields I have listed on page 93.

Tools for generating reports

Once you've understood the meaning of the different columns and fields where Project tracks date, effort and cost information, you can create custom reports for your needs.

There are a variety of reporting features in the Report ribbon that are worth taking a look at. For this book, I won't go into the details on how they are used because this could fill an entirely separate book. With the understanding you have gained in this book, you should be able to get started quickly with the reporting tools offered by MS Project.



CHAPTER 16

A Few Final Words

Congratulations! If you've made it to this point, you've accomplished a lot. I know I've given you a lot of material to go through in this eBook, but you now have the knowledge to schedule your own projects in Microsoft Project. Before we finish up, here are a few final thoughts I'd like to share with you.

Mastering MS Project Requires Practice

As with any software or skill, you get better through experience. MS Project is a complex tool and you don't become an expert overnight. Try to practice as much as possible by creating sample schedules, experimenting with resource allocations, using different task types, entering actuals data and observing how the data columns change.

Don't Be Afraid to Ask for Help

When you use MS Project to create real schedules, you'll sooner or later face scenarios that you don't know how to show in MS Project. Fortunately, there are great resources where you can find help. The best one is the Microsoft Technet Forum, the official support forum. Before you post a question, do a quick search in the forum – probably someone else had the same question before. Another good forum (not as popular though) is the MPUG forum by the MS Project User Group. Make sure you also check out my MS Project blog articles and videos.

Thank you

I hope you found the eBook useful and I hope I was able to get you excited about MS Project! It's an awesome tool and once you become familiar with it, you don't want to miss it anymore.

If you have an extra minute, I'd love to hear your feedback on the book (my email).

Thanks again and good luck for your projects!

Adrian