

## MODULE 4: Assigning resources to the tasks in Project

There are three types of resources used to manage and allocate project work effectively. These resources help in scheduling, budgeting, and tracking progress.

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt.	Cost/Use	Accrue	Base	Code
Peter - Developer	Work		P		100%	\$10.00/hr	\$0.00/hr	\$1.00	Prorated	Standard	
Mary - Tester	Work		M		100%	\$20.00/hr	\$0.00/hr	\$2.00	Prorated	Standard	
Hard drive	Material	pack	H			\$70.00		\$0.00	Prorated		
Cloud Service	Material	service	C			\$10.00		\$0.00	Prorated		
Travel Expenses	Cost		T						Prorated		
Legal & Compliance Costs	Cost		L						Prorated		

### 1. Work Resources (People & Equipment)

Definition:

- These are resources that perform work on tasks in the project.
- Their tasks is measured in units of time (hours, days, weeks).
- They can have a defined capacity (% availability), work schedules, and **hourly/daily/monthly/yearly costs. [Std.Rate], [Cost/Usage]**
- They can get a private working time **[Base]**

Examples:

- **People:** Software Developers, System Architects, Business Analysts, Project Managers, QA Testers, UI/UX Designers, Database Administrators, Network Engineers, Cybersecurity Experts.
- **Equipment:** Servers, Cloud Computing (e.g., AWS, Azure), Version Control Systems – GitHub, GitLab, or Bitbucket for managing code versions.

How it works in Microsoft Project 2016:

- When a work resource is assigned to a task, Microsoft Project calculates the amount of work based on the resource's availability and the task duration.
- You can set work schedules to ensure proper workload distribution and avoid over-allocation.

### 2. Material Resources (Consumable Items)

Definition:

- These are physical materials that are consumed as work progresses.
- They do not have a work capacity (availability % does not apply).
- They are measured in units like **GB, TB, units, meters, liters, kilograms, or pieces** instead of time.

Examples:

### **Hardware & Consumable IT Equipment**

- Storage Devices – Hard drives, SSDs, USB flash drives.
- Cables & Networking Accessories – Ethernet cables, adapters, routers.
- Backup Media – DVDs, tapes, external hard drives for data backups.
- Batteries & Power Supplies – UPS batteries, laptop chargers.

### **Software Licenses & Subscriptions**

- Operating System Licenses – Windows, macOS, Linux distributions.
- Development Tools – Visual Studio, JetBrains IDEs, MATLAB.
- Database Licenses – SQL Server, Oracle, MySQL Enterprise.
- Cloud Services – AWS, Azure, Google Cloud storage and computing.

### **Office & Miscellaneous Supplies**

- Printed Documents & Manuals – Requirement specifications, test plans.
- Stationery – Whiteboards, markers, sticky notes for agile teams.
- Headsets & Microphones – Used for remote meetings and testing.

How it works in Microsoft Project 2016:

- When adding material resources, you specify the unit of measurement (e.g., GB, TB, meters, units, licenses, pages, packs, ...).
- Microsoft Project does not schedule material resources based on work time but tracks the quantity required for each task.

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## **3. Cost Resources (Fixed Expenses)**

Definition:

- These represent financial costs that are associated with a task but are not dependent on work time.
- Unlike work resources, cost resources do not have a fixed availability or work rate.

Examples:

### **Software & Licensing Costs**

- Cloud Services Subscription – AWS, Azure, Google Cloud fees.
- Software Licenses – Microsoft Office, Adobe Suite, Visual Studio.

- Database Licensing Fees – SQL Server, Oracle, MySQL Enterprise.

### Infrastructure & Hardware Costs

- Server Rental – Monthly or yearly hosting fees.
- Data Center Costs – Fees for colocation or cloud hosting.
- Networking Costs – ISP charges, VPN subscriptions.

### Professional & Outsourcing Fees

- Consulting Fees – Payments to external consultants.
- Freelancer/Contractor Payments – Web developers, security experts.
- Training & Certification Costs – Courses for IT staff.

### Business & Operational Costs

- Travel Expenses – Flights, hotels, transportation for meetings.
- Conference Fees – IT summits, training workshops.
- Legal & Compliance Costs – GDPR, software patents, security audits.

How it works in Microsoft Project 2016:

- When assigning a cost resource to a task, you manually enter the amount.
- Microsoft Project does not calculate cost resources based on time worked; instead, it simply adds them to the task budget.

## Exercise 1. Entering Resources

- Open the Exercise 1 (Module 3)
- Tab View → Resource Sheet / Tab Task → Resource Sheet

Add the resources for this project below: Work (the person)

STT	Name	Initials	Groups	Max. Units	Std. Rate
1.	David	D	Consultant	100%	8
2.	Brian	B	Staff	100%	7
3.	Mary	M	Staff	100%	7
4.	John	J	Staff	100%	7
5.	Worker 1: Liam	W1	Worker	100%	6
6.	Worker 2: Chang	W2	Worker	100%	6

- Assign the resources for each task in the project

Tab Task → Gantt Chart → Add Column Resource Name, Cost

Select the task that you want to assign the resources:

ID	TASK NAME	Resource Names	Cost
1	clean machine	Worker 1, David	
2	load raw materials	Worker 2	
3	prime machine	Mary	
4	Test run	Brian	
5	clean machine	Worker 1	
6	load raw materials	Worker 2	
7	prime machine	John	
8	Test run	David	

Capture images:

- Gantt Chart (Resource Name, Cost Column)
- Display the Project Information (Statics): Duration, Hours, Cost
- Resource Sheet
- Resource Usage

## Exercise 2. Entering resources

- Open the Exercise 2 (Module 3)
- Tab View → Resource Sheet

Add the resource for this project below: Material Type

STT	Name	Type	Materials	Initials	Groups	Std. Rate
1.	MDF	Material	Sheet	Md	Material	20
2.	Flooring	Material	Pack	Fl	Material	80
3.	Purple Material	Material	Roll	Pu	Material	30
4.	Orange Material	Material	Roll	Or	Material	120

- Assign the resources for each task in the project

Tab Task → Gantt Chart → Add Column Resource Name, Cost

The information of resources that assigning to each task

ID	TASK NAME	RESOURCE Names	Cost
1	Visit estate agents	MDF [2]	
2	View properties	Flooring [2]	
3	Decide what to buy	Purple Material [1]	
4	Make offer	Flooring [1], Purple Material [1]	
5	Wait for decision	Flooring [1], Orange Material [1]	
6	offer a accepted	Orange Material [2]	

Capture images:

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### Exercise 3. Entering resources

- Create the project bellowing:

ID	TASK NAME	PREDECESSOR	DURATION
1	Planning	-	1 wk
2	Requirement documents	1	2 wks
3	Sign off	2	1 day
4	Development	3	10 wks
5	Testing	4	4 wks
6	Implementation	5	2 wks
7	Review	6	1 wk

- Tab View → Resource Sheet / Tab Task → Resource Sheet  
Add the resources this project bellow: Work/Material

STT	Name	Type	Materials	Initials	Groups	Std. Rate
1.	PM	Work		PM	Sponsor	10
2.	Designer	Work		Ds	Staff	6
3.	Developer	Work		Dp	Staff	8
4.	Tester	Work		Tt	Staff	6
5.	Maintainer	Work		M	Staff	5
6.	Operating System	Material	Unit	OS	Material	120
7.	Internet Provider	Material	Unit	ISP	Material	100
8.	Cable	Material	M	Cb	Material	1
9.	Visual Studio	Material	Unit	VS	Material	20

- Assign the resource for each task in the project

ID	TASK NAME	Work	Material
1	Planning	PM	
2	Requirement documents	PM, Designer	
3	Sign off	PM	
4	Development	Developer	Operating System[1] , Visual Studio [1]
5	Testing	Tester	
6	Implementation	Maintainer	Operating System , Visual Studio, Cable [100]
7	Review	PM, Maintainer	

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### Exercise 4. Entering resources

- Open the Exercise 3 (Module 3)
- Tab View → Resource Sheet → Resource Views  
Add the resources that type is work (default) for the project below:

STT	Name	Initials	Groups	Max. Units	Std. Rate
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1.	Architect	Arc	Consultant	100%	9
2.	Draftsperson	Dft	Staff	200%	7
3.	Building Clerk	BC	Staff	100%	8
4.	Supervisor	Sup	Staff	100%	12
5.	Rigger	Rig	Wages	600%	5
6.	Boilermaker	BM	Wages	600%	5
7.	Welder	Weld	Wages	500%	6
8.	Carpenter	Car	Wages	800%	7
9.	Painter	Ptr	Wages	500%	6
10.	Labourer	Lab	Wages	1,000%	6
11.	Driver	Drv	Wages	300%	8
12.	No Barrier Fencing	NBF	Contractor	100%	3
13.	Rock Solid Concrete	RSC	Contractor	100%	4
14.	Listen Ear Audio	LEA	Contractor	100%	5
15.	In Focus Video	IFV	Contractor	100%	5
16.	Pure Grass Turf	PGT	Contractor	100%	5
17.	Building Inspector	BI	Government	100%	5
18.	High Jib Crane	HJC	Equipment	100%	7
19.	Grader	Grd	Equipment	200%	6
20.	Air Compressor	AC	Equipment	100%	7
21.	Utility	Ute	Equipment	200%	5
22.	Electrician	Cap	Staff	400%	7
23.	Plumber	Plu	Staff	400%	5

- Establish the resources that type is material for the project below at the of Resource list above:

STT	Name	Type	Materials	Initials	Groups	Std. Rate
24.	Astro Turf	Material	Square Matre	Grass	Material	12
25.	Paint	Material	Ultre	Paint	Ute	20

- Assign the resources for each task in the project

ID	TASK NAME	RESOURCE
1	Planning	
2	Creating architectural plans	Architect, Draftsperson (200%), Building Clerk (25%)
3	Submit plans for approval	Architect
4	Order materials	Draftsperson, Building Clerk
5	Planning Completed	
6	Site works	
7	Erect fencing	No Barrier Fencing
8	Erect site building	Carpenter (400%), Supervisor, Labourer
9	Clear and level site	Supervisor, Grader(200%), Driver(200%)
10	Prepare drainage infrastructure	Supervisor(50%), Plumber(200%)
11	Prepare cabling infrastructure	Supervisor(50%), Electrician(300%)
12	Site works Completed	
13	Building Construction	
14	Pour foundations	Rock Solid Concrete

15	Erect steelwork	Supervisor [50%], Rigger [600%], Boilermaker [600%], Welder [500%], Labourer [600%], Driver [200%], High Jib Crane, Utility
16	Erect wall	Supervisor [50%], Carpenter [700%], Labourer [400%], Driver, Grader, Air Compressor, Electrician [75%], Plumber [25%]
17	Install roofing superstructure	Supervisor [50%], Rigger [500%], Boilermaker [500%], Welder [300%], Labourer [500%], Driver [200%], High Jib Crane, Utility, Air Compressor, Plumber [50%]
18	Install roofing retracting mechanism	Supervisor [50%], Welder, Boilermaker [200%], Rigger [200%], Electrician [200%], Driver, High Jib Crane
19	Erect seating tiers	Supervisor [50%], Carpenter [800%], Welder [200%], Boilermaker [200%], Labourer [500%], Driver, Utility, Air Compressor
20	Building Construction Completed	
21	Fit Out	
22	Fit all windows and doors	Carpenter [500%], Labourer [200%]
23	Install electrical cabling	Electrician [300%], Labourer [200%]
24	Install electrical fittings and fixtures	Electrician [300%]
25	Install all plumbing	Plumber [200%], Labourer [200%]
26	Install plumbing fixtures and fittings	Plumber [200%]
27	Lay astro turf	Pure Grass Turf
28	Erect handrails and fencing	Welder [400%], Boilermaker [200%]
29	Paint rooms, fixtures, fittings, etc.	Painter [500%]
30	Install PA system	Listen Ear Audio
31	Install video imaging equipment	In Focus Video
32	Fit out control room	Electrician [200%], Listen Ear Audio, In Focus Video
33	Fit out Completed	
34	Commissioning	
35	Test roof mechanism	Supervisor, Electrician [200%], Rigger
36	Test PA system	Listen Ear Audio
37	Test video imaging equipment	In Focus Video
38	Test control room equipment	Supervisor, Listen Ear Audio [20%], In Focus Video [20%], Architect, Electrician [200%]
39	Obtain official occupancy	Architect, Building Clerk, Supervisor
40	Obtain safety certification	Supervisor
41	Official opening	Supervisor[200%]



42	Commissioning Completed	
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Capture images:

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## Exercise 5. Resources with the private working time

- Creating the Calendars with working times:

### PM\_Time:

1. Working time: Mon – Sat: 7AM – 11AM
2. Nonworking time: Sun
3. Exception: Nonworking time: 30/4, 1/5, 2/9

### Dev\_Time:

1. Working time: Mon – Fri: 8AM – 11AM, 1PM – 5PM
2. Nonworking time: Sat, Sun
3. Exception: Nonworking time: 30/4, 1/5, 2/9

### Extra\_Time:

1. Working time: Mon – Fri: 6PM – 9PM
  2. Nonworking time: Sat, Sun
  3. Exception: Nonworking time: 30/4, 1/5, 2/9
- Creating the following tasks

No	Task Name	Duration (days)	Dependencies
1	Requirement Analysis	5	-
2	Project Planning	3	1
3	UI/UX Design	7	1
4	Database Design	5	1
5	Backend Development	14	4
6	Frontend Development	14	3
7	Frontend & Backend Integration	5	5, 6
8	Testing & Bug Fixing	7	7
9	Deployment to Test Environment	3	8
10	Evaluation & Optimization	5	9
11	Official Deployment	2	10
12	Maintenance & Support	Ongoing	11

- Tab View → Resource Sheet / Tab Task → Resource Sheet  
Add the resources this project bellow: Work/Material/Cost  
Each Resource bases on a type of working time:

No.	Name	Type	Quantity	Unit	Std.Rate	Base	Related Tasks
1	Project Manager	Work	1	Person	20	PM_Time	Project Planning



2	System Analyst	Work	3	Person	15	Extra_Time	Requirement Analysis, Database Design
3	Backend Developer	Work	4	Person	18	Dev_Time	Backend development, Frontend & Backend Integration
4	Frontend Developer	Work	3	Person	17	Dev_Time	Frontend development
5	UI/UX Designer	Work	2	Person	16	Extra_Time	UI/UX design
6	Tester	Work	3	Person	16	Dev_Time	Testing & bug fixing
7	Cloud Server (AWS, Azure)	Cost	1	Subscription	200		Data storage, application deployment
8	Software Licenses	Cost	1	Software Package	99		Deployment to Test Environment
9	Developer Workstations	Material	4	Units	1200		Deployment to Test Environment
10	UI/UX Design Tools	Cost	1	Software Package	200		Official Deployment
11	Testing Tools (Selenium, JMeter)	Cost	1	Software Package	90		Testing & bug fixing, Evaluation & Optimization

Capture images:

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- Resource Usage

## Exercise 6. The Engagement planning

Creating the following tasks

STT	Name	Duration	Dependencies
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1.	The Engagement	1 day	
2.	The Venue - Confirm Dates	4 wks	1
3.	The Photographer	3 wks	2
4.	The Cars	4 wks	2
5.	The DJ	1 wk	2
6.	The Dress - Find the Perfect Dress	3 wks	2
7.	The Venue - Confirm Menu	4 wks	2
8.	The Venue - Pay Deposit	2 hrs	7
9.	The Dress - Pay for Dress	1 hr	6
10.	Invitations - Confirm Design	2 wks	6
11.	The Flowers	2 wks	6
12.	Invitations - Confirm Numbers	1 wk	10
13.	Invitations - Invites Produced	2 mons	12
14.	Review progress	4 wks	3,4,5,8,9,11,12,13
15.	Invitations - Send Out	1 wk	13
16.	The Dress - First Fitting	2 hrs	9
17.	Invitations - Review RSVP's	1 wk	15
18.	The Venue - Confirm Numbers	2 hrs	17
19.	The Venue - Confirm Timings	2 hrs	18
20.	The Venue - Pay Balance	1 hr	19
21.	The Dress- Final Fitting	2hr	20

- Create a milestone task at the end: The Big day (P) (Dependencies: 19,21)
- Creating the summary tasks :
  - Before 6 month to go (Task 2,3,4,5,6,7)
  - 6 month to go (Task 8,9,10,11)
  - 5 month to go (Task 12,13)
  - 4 month to go (Task 14)
  - 3 month to go (Task 15)
  - 2 month to go (Task 16,17)
  - 1 month to go (Task 18,19,20,21)
- Establish the resource table:

STT	Name	Type	Initials	Groups	Max. Units	Std. Rate
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1.	Venue	Material	Initials			£3,000.00
2.	Photographs	Material	V			£1,000.00
3.	Flowers	Material	P			£900.00
4.	Cars	Material	F			£500.00
5.	DJ	Material	C			£250.00
6.	Guest	Work	D		8000%	£25/1hr
7.	Cost					

- Assign the resource for each task in the project

STT	Name	Resource
1.	The Engagement	
2.	The Venue - Confirm Dates	Venue[1]
3.	The Photographer	Photographs[3]
4.	The Cars	Cars[1]
5.	The DJ	DJ[1]
6.	The Dress - Find the Perfect Dress	Cost [10]
7.	The Venue - Confirm Menu	
8.	The Venue - Pay Deposit	Cost[£120]
9.	The Dress - Pay for Dress	Cost [£210]
10.	Invitations - Confirm Design	Cost[£90]
11.	The Flowers	Flowers[1]
12.	Invitations - Confirm Numbers	
13.	Invitations - Invites Produced	
14.	Review progress	
15.	Invitations - Send Out	
16.	The Dress - First Fitting	
17.	Invitations - Review RSVP's	
18.	The Venue - Confirm Numbers	
19.	The Venue - Confirm Timings	
20.	The Venue - Pay Balance	Guests[7,000%]
21.	The Dress- Final Fitting	
22.	The Dress- Final Fitting	

Capture images:

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