Case Study

Description

AeroUA is an innovative company that develops and manufactures equipment for aeronautics. Currently, the company is planning a new product development project, which will be presented with a large distributor on 21 March 2026. A 50.000 euros penalty should be paid if AeroUA fails to meet the deadline.
This project will be carried out by a dedicated team of several people, from which three, Maria, Rui, and Lucas, have been assigned to the project on a full-time basis (this means that the costs of these people will be fixed costs for the project, as if they worked 8 hours a day, for the whole length of the project).
The planning office has already identified the tasks, predecessors, and estimated durations (according to established resource minimum requirements). With this information, it is already possible to plan a calendar baseline for the project.
At the current stage of the planning process, you are challenged to allocate resources. The allocation must have into account the resources' availability (notice that some resources are not available at the start of the project, some have scheduled vacations, and some have contracts of less than 100% capacity), cost, and skills.
For this project, the planning office decided that the required skills at stake are related to engineering, tests and analysis, production, logistics, and sales & marketing; of course, different tasks will require some of these skills at different levels of expertise, here established with a 0-6 points scale – "0" meaning that the skill is null, 6 being the highest level of expertise. Skill's requirements of tasks and resources' skills are both defined using this 0-6 scale.
The planning objective is to finish the project in time, whereas the budget must not exceed 440,000 euros (including a management reserve of 10%).
You should try and allocate resources to activities by matching tasks' requirements and people's skills, meeting availability and costs' constraints. You may have to face situations where it is not possible to meet all requirements, and consequently admit some delays in certain tasks.

1) Plan and analyse the project with M. Project. [17/20]
2) Considering the company's experience, some risks are anticipated, related to activities 1, 7, and 13 (see page 3); a risk register shows the probability of occurrence and the expected impact in terms of cost and work (duration). Risk mitigating actions are cumulative, having different impacts on cost and duration. It's always possible to decide not to do anything…
   Review your plan, taking risk into account. [3/20]

Notes:
1) You should use Microsoft Project (version 2019, or 2021)
2) The start date of the project is 5 January 2026.
3) Consider working time is from Monday to Friday, 8 hours a day; do not consider holydays.
4) When declaring activities in M. Project, keep the original labels of table 1 (e.g: "1 – Detailed specifications"; "2 – Stress analysis", etc.).
5) Do not allocate a resource to more than 6 tasks.
6) When done, you should deliver your working files (.mpp, .xls, etc.), containing the plan, and a report (.pdf), describing your assumptions, detailed approach, analysis, risk plan, and the cost baseline (cash flow).
7) The deadline is 23 April 2025.

Appendix

TABLE 1 - ACTIVITIES

Activity	Number of people	Estimated duration (working days)	Predecessors	Required skills				
				Engineering	Tests and analysis	Production	Logistics	Sales & Marketing
1 Detailed specifications	3	5	-	5	3	2	2	
2 Stress analysis	1	7	1	4	5	2		
3 Composite definition	2	10	1	4	3	4		
4 Concept development	2	12	1	6	4			
5 Case modelling	2	8	3,4	5		4	1	
6 Prototype execution	2	13	2,5	4	2	4		
7 Production planning	4	15	5			5	5	1
8 Mould making	3	14	5	3		3	3	
9 Preparation of tests	3	5	4	2	5			
10 Execution & analysis of tests	1	10	6,9	2	6			
11 Call for tenders to suppliers	2	11	1	2		5	4	2
12 Production costs calculation	3	6	5	2		2	3	4
13 Supplier selection	4	11	11	2		2	3	5
14 Cost-benefit calculations	1	5	7, 12, 13			2	3	6
15 Integration Plan	3	3	8, 10, 14	4	3	5	3	3
16 Documentation	1	22	2	4	1	4	2	
17 First series	4	2	15, 16	2		4	4	

TABLE 2 - RESOURCES

Name	Cost/hour (euro)	Availability for the project	Available from week:	Vacations in week:	Skills				
					Engineering	Tests and analysis	Production	Logistics	Sales & Marketing
Alex	86	100%	4		3	1	2	2	
Ana	160	100%	2	3	6	5	6	3	
Diogo	102	100%	4	9,10	3	2	4		2
Leonor	87	80%	3		2	3	3		
Felix	89	100%	6		1		4		1
Rui	89	90%	1	11	2	4	2		
José	135	80%	2		6	3	5	2	
João	125	100%	3		4	6	5		
Miguel	97	100%	2	4,5	1	1		4	6
Carlos	70	70%	3		2		4		
Marco	89	100%	3		1			5	5
Paulo	175	100%	4		5	5	6	3	1
Pedro	128	80%	2		6	4	4	1	
Maria	151	80%	1	6	5	3	4	5	3
Tiago	58	100%	3	4	3		3		
Lucas	97	100%	1	7,8	2		4	3	

RISK REGISTER

ID	Description	Activity	Probability	Impact	
				Additional cost	Additional duration
1	Scope creep	1 Detailed specifications	25%	8000	5 days
2	Software and hardware failure	7 Production planning	20%	20000	5 days
4	Supplier increases the price	13 Supplier selection	10%	20000	10 days

Risk Plan Response

Note: responses to risk are cumulative (except *accepting the risk*), as well as their impact

Risk 1

	Action	Response cost	Expected impact on additional cost	Expected impact on additional work
A	Ensure that the charter and the scope statement are signed by the sponsor before the project starts	0	-5000	-2 days
B	Ensure that all scope changes are accepted and approved	400	-1000	0
C	Escalate all scope changes to top management	900	-500	0
D	Ensure to plan enough time to collect requirements	600	-800	0
E	Accept the risk and take none of these measures	0	0	0

Risk 2

	Action	Response cost	Expected impact on additional cost	Expected impact on additional work
A	Purchase standby equipment	0	-10000	-2 days
B	Prepare a list of suppliersand negotiate fast delivery conditions	2000	-500	-2 days
C	Train team members to replace equipment quickly and efficiently	1200	-500	0
D	Take out a contract for fast server replacement and additional data backup	1000	-8500	0
E	Accept the risk and take none of these measures	0	0	0

Risk 3

	Action	Response cost	Expected impact on additional cost	Expected impact on additional work
A	Include special pricing conditions in the purchase contract	0	-3000	0
B	Freeze 4000 euros in the reserve budget for potential overruns on cost	4000	0	0
C	Try to complete the purchase as soon as possible to avoid future price rises	1000	-12000	-5 days
D	Intensively search for alternative suppliers	0	-5000	0
E	Accept the risk and take none of these measures	0	0	0