



Case Study

Description

TECH-Degeit is an innovative company that develops and manufactures new electronic consumer products. Currently, the company is planning a new product development project, with a firm deadline of March 21st, 2025. It's important to be mindful that each working day that exceeds this deadline will cost the project 500 euros, emphasizing the need for us to be diligent and efficient in our work.

This project will be carried out by a dedicated team of several people, of whom 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 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, a calendar baseline for the project can already be planned. At the current stage of the planning process, you are challenged to allocate resources. The allocation must consider the resources' availability (notice that some resources are unavailable 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 requirements of tasks and resources skills are defined using this 0-6 scale.

The planning objective is to finish the project on time, and the budget must not exceed 440000 euros (including a 10% management reserve).

You should try to allocate resources to activities by matching task requirements and people's skills, meeting availability and cost constraints. However, you may have to face situations where it is not possible to meet all requirements and consequently admit some delays in specific tasks.

- 1) Plan and analyse the project with M. Project. [17/20]
- 2) Some risks are identified and associated with various activities, as shown in the risk register on page 3. The probability of occurrence and the expected impact are indicated for each risk, translated into cost and work (duration). The risk mitigation measures are cumulative, producing effects on cost and time. Of course, you can always decide not to do anything (it's a possible measure!). Revise the plan developed in a) considering your risk analysis. [3/20]

Notes:

- 1) You should use Microsoft Project (version 2019 or 2021)
- 2) The start date of the project is 6 January 2025.
- 3) Consider working time is from Monday to Friday, 8 hours a day; do not consider holidays.
- 4) When declaring activities in M. Project, keep the original labels of Table 1 (e.g., "1 – Specifications"; "2 – User interface", 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 cost baseline (cash flow).
- 7) The deadline is 15 December 2024.
- 8) The group assignment will be discussed in the 16-20 December week in practical classes



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 suppliers and 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 |