Group 1

04_Basic project planning techniques

Examples

Example 4 - 1: Developing a Project Plan at Master Control Company

The Master Control Company (MCC), a medium-sized engineering firm, was approached by Bier Publishing Company to develop a control unit for tracking the production process of two multistage, high-efficiency printing presses. Bier's engineering department initiated the project by sending MCC a list of requirements for power, wiring, performance, and possible future enhancements for the unit. MCC appointed a project manager to oversee design and development of the unit and to prepare a proposal.

MCC's engineering group conceived an initial, theoretical design that covered all requirements. Throughout the design process they consulted with engineers at Bier and altered the design several times. Included with the final design were blueprints, a manual of operations specifications, and a bill of materials for parts.

With this design, MCC's manager of marketing performed a detailed analysis of the price of parts and cost of labor. MCC's production manager also examined the design, and with the project manager prepared a work breakdown structure (WBS) and tentative project plan outlining the major work tasks.

The project manager convened a meeting with representatives from engineering, marketing, and production to review the design, project plan, and costs. The production department supplied information about the kind of labor expertise needed, parts availability, and an estimate of the time required to produce the unit. Marketing provided information about the costs of labor, parts and supplies, and the overall project. Having this information the project manager was able to complete the project plan, develop a bid price, and combine the two into a proposal. Notice that, in terms of the systems development process, the stages of initiation, feasibility, definition, and most of the design were completed before the proposal was even sent.

Following negotiation and contract signing, the project manager and production manager developed a detailed master plan. This plan contained much the same information as the proposal, but was updated and expanded to include schedules for materials and parts procurement, a plan for the labor distribution across work tasks, a management and task responsibility matrix, and a detailed master schedule.

Questions:

1. Who prepares project proposal?

   Production manager and project manager

2. What is the output of design process? What is content of the (design process) output?

   Blueprints, a manual of operations specifications, and a bill of materials for parts.

3. List three departments involve in the preparation of Work Breakdown Structure.

Marketing, Production and Project departments

4. What information the project manager should take from other department? And why?

   Final product, cost for products, and customer's expectation to estimate the profit can make by the products to maximize profit or shut it down before the losses is too big

5. What is the difference(s) between project proposal and project master plan?

   Audience

   One significant distinction between a plan and a proposal is who reads them. Project plans are read by internal project implementors or officers. Project submissions are read by external donors or evaluators. It is critical, like with all writing, to consider your audience while choosing words and topics to discuss. The strategy may be great using abbreviations frequently used within your organization, but donors will have no idea what you're talking about. Furthermore, funders may not have the same level of understanding of local issues as you, so make sure to provide enough project background in the request.

   Purpose

   Project officers require the project plan to guide their project implementation. To make a financial choice, donors require a proposal. This indicates that the

   Tone

   In both plans and proposals, the tone, which establishes the mood or attitude of the writing, is frequently formal. Plans are often impersonal papers that focus on technical aspects. Proposals, on the other hand, should be official but can also include more personal touches. Proposals persuade potential donors to take action. They can be written as an emotive appeal, a factual argument, an optimistic vision for the future, a terrible warning of the existing condition, and so on to achieve this.

   Message

   A excellent project plan specifies how to carry out the project. A strong project proposal clarifies why the project will be carried out. Although the difference is minor, the adjustment in tone and writing style has a significant impact.

Example 4 - 2: Scope Statement for the LOGON Project

The RFP for Midwest Parcel Distribution Company's (MPD's) LOGON project specifies "The Contractor's responsibility shall be for furnishing expertise, labor, materials, tools, supervision, and services for the complete design, development, installation, checkout, and related services for full operational capability of the LOGON system." It also specifies technical performance requirements for the system, as well as exclusions, e.g., "Removal of existing storage, placement, and retrieval equipment will be performed under separate contract …"

During proposal preparation Iron Butterfly Contractors decided that the system that would best meet MPD's needs is one that will employ robotic transporter units for placing and retrieving shipping containers from racks as instructed by a computerized neural-network system. Analysis of MPD's requirements and budget constraint and a preliminary system design effort lead Iron Butterfly to create the following scope statement for the LOGON proposal.

1. Background: (Short description of MPD's Chicago distribution facility, and of the purpose and objectives of the LOGON system).
2. Description of the work to be done: design, fabrication, installation, test, and checkout of a transport, storage, and database system for the automatic placement, storage, and retrieval of standardized shipping containers.
3. Deliverables and main areas of work:
   (a) Overall system: Create basic design. Reference requirements A and B.
   (b) Racks and storage-bucket system (termed " Hardware A"): Develop detailed design. Storage-bucket system is Model IBS05 modified to meet requirements C.1 through E.14.
   (b) Racks and storage-bucket system (termed " Hardware A"): Develop detailed design. Storage-bucket system is Model IBS05 modified to meet requirements C.1 through E.14.
   (c) Robotic transporter units and track system (termed " Hardware B "): Develop detailed design. RTU is Model IBR04 modified to meet requirements F.1 through G.13.
   (d) Neural-network, database, and robotic-controller system: Develop software specifications. Reference requirements H.1 through H.9 and K.3.
   (e) Hardware A and Hardware B: Procure software, subassemblies, and components. Reference requirements K.1 through L.9.
   (f) Hardware A and Hardware B: Fabricate at Iron Butterfly site. Reference requirement M.
   (g) Overall system: Install and check-out at MPD site. Reference requirement Y

Items (a) through (g) represent deliverables for different stages of the project; associated with each are specific requirements (the "reference requirements"), which are check-off or acceptance criteria listed in a separate document and appended to the scope statement. For example, the detailed designs noted in items 2 and 3 must be sufficiently comprehensive to enable subcontractors to produce components and subassemblies for Hardware A and Hardware B; the reference requirements C.1 through E.14 and F.1 through G.13 specify the level of detail

necessary for that to happen. The scope statement will also contain exclusions as noted in the Requirement for proposal (RFP) or identified later.

Requirement: Identify the scope statement (sentences)

ANSWER

1. Background: (Short description of MPD's Chicago distribution facility, and of the purpose and objectives of the LOGON system).
2. Description of the work to be done: design, fabrication, installation, test, and checkout of a transport, storage, and database system for the automatic placement, storage, and retrieval of standardized shipping containers.
3. Deliverables and main areas of work:
   a. Overall system: Create basic design. Reference requirements A and B.
   b. Racks and storage-bucket system (termed " Hardware A"): Develop detailed design. Storage-bucket system is Model IBS05 modified to meet requirements C.1 through E.14.
   c. Robotic transporter units and track system (termed " Hardware B "): Develop detailed design. RTU is Model IBR04 modified to meet requirements F.1 through G.13.
   d. Neural-network, database, and robotic-controller system: Develop software specifications. Reference requirements H.1 through H.9 and K.3.
   e. Hardware A and Hardware B: Procure software, subassemblies, and components. Reference requirements K.1 through L.9.
   f. Hardware A and Hardware B: Fabricate at Iron Butterfly site. Reference requirement M.
   g. Overall system: Install and check-out at MPD site. Reference requirement Y

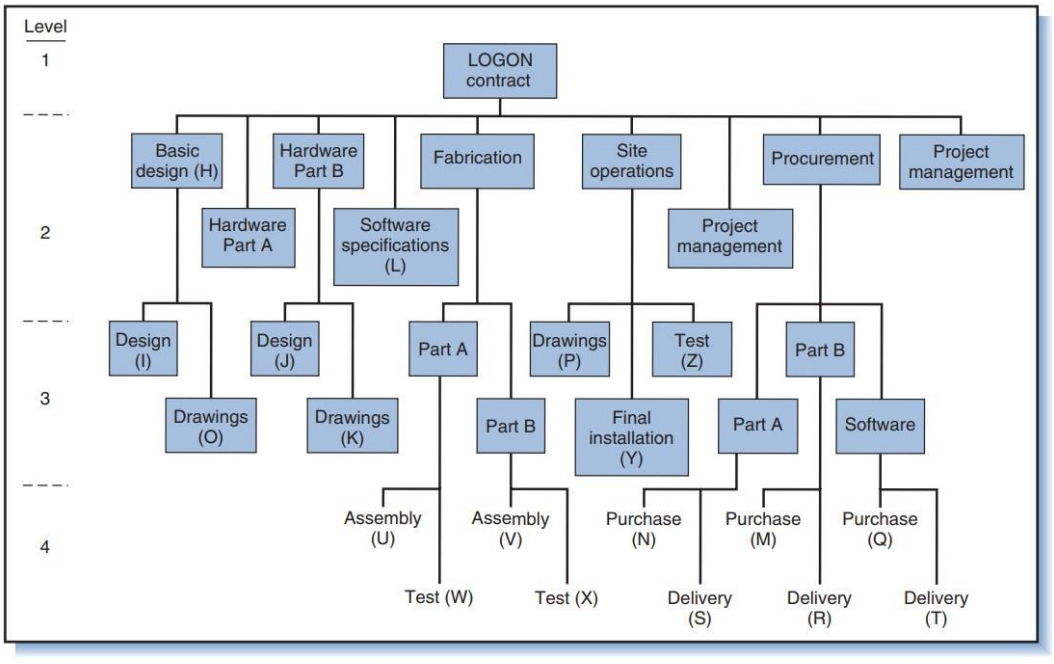
Example 4-3: Process of Developing the WBS for the LOGON Project

The project manager and staff meet in a brainstorming session to create the WBS for LOGON. They meet several times, first during proposal preparation to identify key deliverables and define the scope of the project, and later during project definition to update the WBS and breakout the work packages into finer detail. In the first meeting they "rough out" the major categories of work and deliverables, identify the responsible functional areas, and create the scope statement described in Example 4-1, which is a Level 2 breakdown.

Later, during project definition, the project manager meets with managers from the functional areas identified as contributing to deliverables in the Level 2 breakdown. The functional managers then work with supervisors and technical staff in their areas to prepare a Level 3 breakdown. Some supervisors then prepare a Level 4 breakdown.

The result is the WBS shown in Figure below. Level 2 divides the project into the major work elements of basic design, Hardware Part A, Hardware Part B, and so on. At Level 3, Hardware Part B is subdivided into design and drawings, which become the work packages for Hardware Part B. Where necessary, other Level 2 items are subdivided into Level 3 or Level 4 items. The box at the bottom of each branch is a "work package." (Notice that different branches of the WBS do not necessarily end at the same levels; this is because each branch is developed separately.) The last step is for the project manager, functional managers, and supervisors responsible for the work packages to review the WBS for final approval.

WBS for the LOGON project. Work packages are lettered H through Z.



Example 4: Work Package Definition for LOGON Project

The LOGON project was divided into 19 work packages, denoted in the boxes lettered H through Z in figure below. Below is an example of the contents of a typical work package, Work Package X: test of Robotic transporter unit (Hardware B).

1. *SOW*: Perform check-out, operational test, and corrections as necessary for sign-off approval of four Batman robotic transporter units, Model IBR04.

2. *Resource requirements*:

• Labor (full-time commitment for 3 weeks): Test manager, two test engineers, three test technicians.

• Procured materials: track for mock-up; all other materials on hand.

• Facility: Iron Butterfly test room number 2 for 3 weeks.

3. *Time*: 3 weeks scheduled; (time critical) start December 2; finish December 23.

4. *Costs* (Cost account RX0522):

Labor: Manager, 75 hours + 25% OH	= $9,750
Engineers, 1,125 hours + 25% OH	= 135,000
Technicians, 1,125 hours + 25% OH	= 112,500
Material:	70,000
Subtotal:	327,250
10% G&A:	32,725
Total:	$359,975

5. *Responsibility*:

• Oversee tests, B.J., manager of robotic assembly.

• Approve test results B.O.B., manager of Fabrication Department.

• Notify of test status and results: J.M., project engineer, F.W.N., site operations.

6. *Deliverables*: Four (4) tested and approved Batman robotic transporters, Model IBR04. Refer to specifications (number 9).

7. *Inputs*:

• Predecessor: Assembly of Batman robotic transporter unit (work package V).

• Preconditions: Test room number 2 setup for robotic transporter.

8. *Quality assurance*: Refer to entry, process, and exit conditions for work package X in the LOGON quality plan.

9. *Risk*: RTU will not meet test requirements because of assembly/integration problems/errors. Likelihood: low. Contingency reserve: one additional week has been included in the schedule as allowance, if needed.

10. *Specifications*: Test specs, refer to test document 2307 and LOGON contract specification sheets 28, 36, and 41; robotic specs, refer to contract requirements G.9 to G.14.

11. *Work orders*: None, pending.

12. *Subcontracts and purchase orders*: No subcontracts; purchase order 8967–987 for track testing material.

Table below gives information about estimated time, cost, and weekly labor requirements for all the work packages in the LOGON project. This information would be developed for each work package on an individual basis.

Activities, time, cost, and labor requirements (result of work breakdown analysis).

Activity	Time (Weeks)	Weekly Direct Cost ($K)	Total Cost ($K)	Weekly Labor Requirement (Workers)
H	10	10	100	5
I	8	8	64	4
J	6	16	96	8
K	4	4	16	2
L	2	18	36	6
M	4	21	84	3
N	4	20	80	2
O	5	10	50	5
P	5	12	60	6
Q	5	16	80	2
R	5	0	0	0
S	3	0	0	0
T	3	0	0	0
U	1	14	14	9
V	5	16	80	14
W	2	12	24	6
X	3	12	36	6
Y	8	13	104	14
Z	6	11	66	5
			Total Direct Cost—$990K	

Example 5: page 188, John M. Nicholas_ Herman Steyn - Project management for engineering, business and technology (2021)

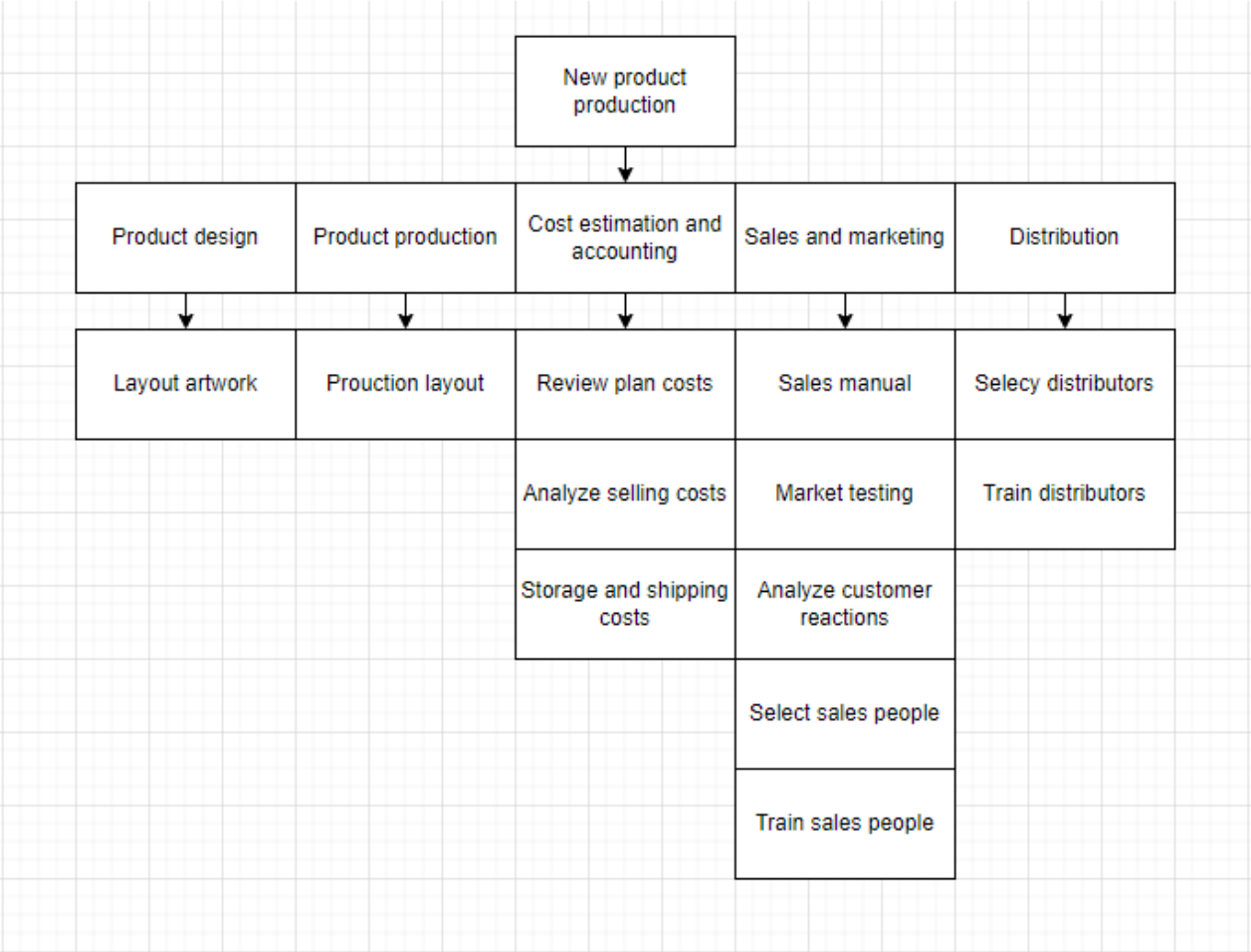
Problems

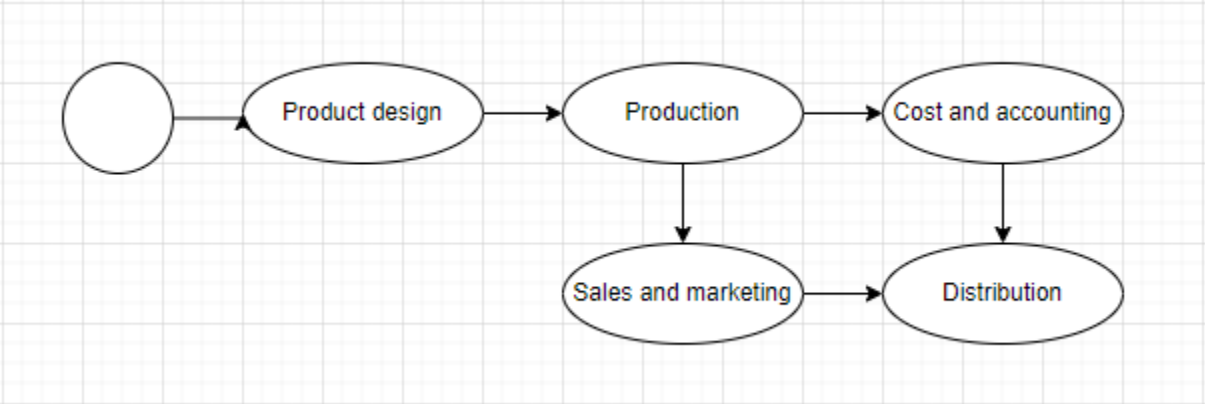
Problem 4-1:

You have just been instructed to develop a schedule for introducing a new product into the marketplace. Below are the elements that must appear in your schedule. Arrange these elements into a work breakdown structure (down through level 3), and then draw the arrow diagram. You may feel free to add additional topics as necessary.

- Production layout
- Review plant costs
- Market testing
- Select distributors
- Analyze selling cost
- Lay out artwork
- Analyze customer reactions
- Approve artwork
- Storage and shipping costs
- Introduce at trade show
- Select salespeople
- Distribute to salespeople
- Train salespeople
- Establish billing procedure
- Train distributors
- Establish credit procedure
- Literature to salespeople
- Revise cost of production
- Literature to distributors
- Revise selling cost
- Print literature
- Approvals*
- Sales promotion
- Review meetings*
- Sales manual
- Final specifications
- Trade advertising
- Material requisitions

(*Approvals and review meetings can appear several times.)



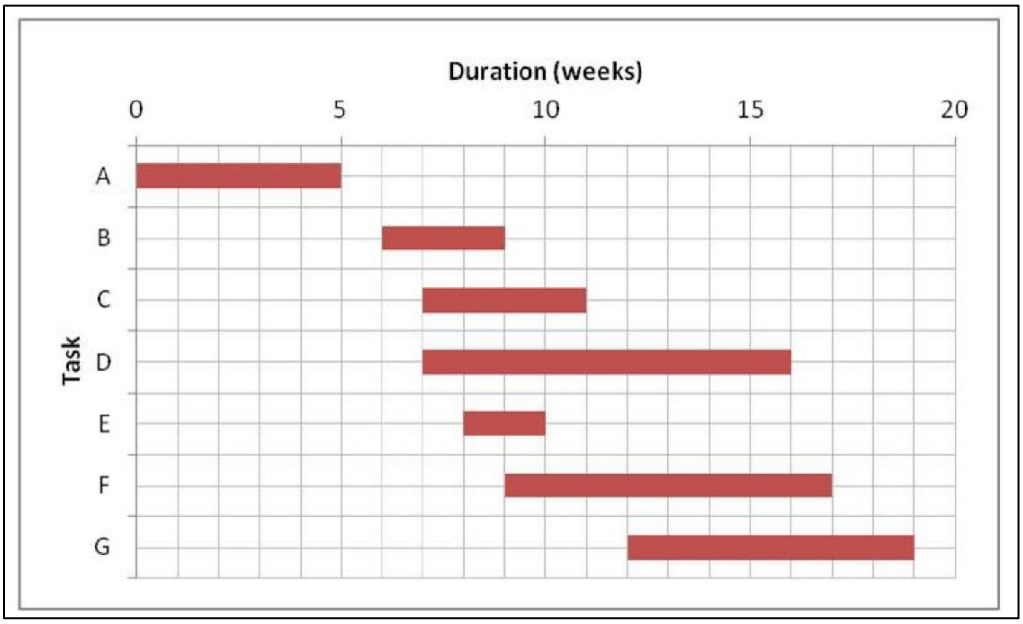


Problem 4 - 2:

Construct a Gantt chart similar to the LOGON project using the following data:

Task	Start Time (Weeks)	Duration (Weeks)
A	0	5
B	6	3
C	7	4
D	7	9
E	8	2
F	9	8
G	12	7

1. When will the last task be completed?



The task will be completed in the 19th week.

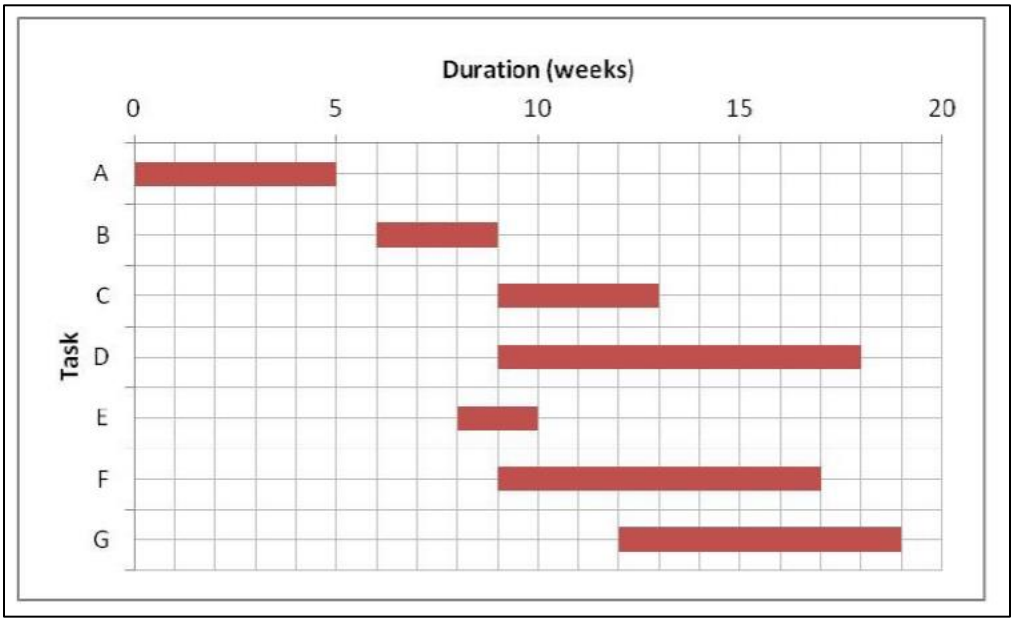
2. How must the Gantt chart you drew in part 1 will be changed if you were told that C and D could not begin until B was completed, and that G could not begin until C was completed? What happens to the project completion time?

For B is ending in the 8th week, hence C & D will start at the 9th week.

Since G can begin earliest by 11th week, as C is ending at the 10th week, there will be no change in G it is already beginning after C is ending.

The project duration still be 19 weeks as the last task G is not being delayed

New Gantt Chart:



3. Suppose the weekly direct expenses are as follows:

Task	Direct Expense ($1,000/Week)
A	10
B	15
C	25
D	35
E	10
F	20
G	10

Construct expense charts, showing weekly and cumulative direct expenses 4.

Use asumption in part 2

Construct expense charts, showing weekly and cumulative direct expenses

Case study 6.4, page 194, John M. Nicholas_ Herman Steyn - Project management for engineering, business and technology (2021)