

Computer Project Exercises

In developing the exercises, trade-offs had to be made to enrich the learning experience. One of the major problems students initially encounter is data and detail overload. This reduces their ability to identify project and data problems and to compare alternatives. Although the project found in the exercises is real, it has been reduced and detail has been eliminated many times to concentrate on applying project management principles and understanding linkages. In addition, other simplifying assumptions have been made so that students and instructors can trace problems and discuss outcomes. These assumptions detract from reality, but they keep the focus on the objectives of the exercises and reduce student frustration with software intricacies. Moving from these exercises to real projects is primarily one of increasing detail.

The POM+ Project*

Big Kola Company has been concerned that specialized fruit drinks have been eroding their cola market. The CEO mandates that “If you can’t beat them, join them.” Grape juice was the first product that was successful after an advertising blitz claiming the antitoxin benefits. Lately, competition is compressing grape juice margins and profits. Months of additional market surveys and focus groups have resulted in three potential high-margin drinks: cranberry, blueberry, and pomegranate. All these choices represent antitoxins. The decision is to produce the pomegranate drink that has many health claims. For example, the relative ability of these juices to eliminate harmful free radicals (antitoxins) is 71 percent for pomegranate, 33 percent for blueberry, and 20 percent for cranberry (Technion Institute of Technology). The market potential appears very attractive and should have a higher profit margin than the other potential juice products. Another appeal for pomegranate juice is its familiarity in the Middle East and Asia.

The Priority Matrix for the POM+ Project is:

	Time	Scope	Cost
Constrain			X
Enhance		X	
Accept	X		

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Connor Gage, the project manager, has formed his project team and the members have come up with the following work breakdown structure.

- 1.0 POM+Project
 - 1.1 R&D product development
 - 1.1.1 Need survey
 - 1.1.2 Set product specs
 - 1.1.3 Shelf life report
 - 1.1.4 Nutrition report
 - 1.2 Secure fruit suppliers
 - 1.3 Initial Production
 - 1.3.1 Equipment rehab
 - 1.3.2 Production trials
 - 1.3.3 Quality trials
 - 1.3.4 Quality metrics
 - 1.3.5 Quality training
 - 1.4 Distribution
 - 1.4.1 Market testing
 - 1.4.2 Package design
 - 1.4.3 Select distributors
 - 1.5 Legal
 - 1.5.1 Complete FDA certification
 - 1.5.2 Register trademark
 - 1.6 Prepare product launch

Part 1

1. Develop the WBS outline using the software available (save your file).
2. Use this file and the information provided below to create a project schedule.
3. The following holidays are observed: January 1, Martin Luther King Day (third Monday in January), Memorial Day (last Monday in May), July 4th, Labor Day (first Monday in September), Thanksgiving Day (4th Thursday in November), December 25 and 26.
4. If a holiday falls on a Saturday then Friday will be given as an extra day off, and if it falls on a Sunday then Monday will be given off.
5. The project team works eight-hour days, Monday through Friday.
6. The project will begin on January 3, 2012.
7. Based on this schedule, submit a memo that answers the following questions:
 - a. When is the project estimated to be completed? How many working days will it take?
 - b. What is the critical path?
 - c. Which activity has the most total slack?
 - d. How sensitive is this network?
 - e. Identify two sensible milestones and explain your choice.

Include the following (one page) printouts:

- A Gantt chart.
- A network diagram highlighting the critical path.
- A schedule table reporting ES, LS, EF, LF, and slack for each activity.

Hints: Change the timescale to months and weeks. The estimated duration of the project is 135 days.

Remember: Save your files for future exercises!

The following information has been derived from the WBS. *Note* that the activity number is what appears in the software with the complete WBS entered.

#*	Activity	Duration	Predecessor(s)
3	Need survey	20	None
4	Set product specs	15	3
5	Shelf life report	10	4
6	Nutrition report	5	4
7	Select fruit suppliers	20	5, 6
9	Equipment rehab	30	4
10	Production trials	15	7, 9
11	Quality trials	20	10
12	Quality metrics	5	11
13	Quality training	15	12
15	Market testing	30	5, 6
16	Package design	15	15
17	Select distributors	25	5, 6
19	Complete FDA certification	15	7, 15
20	Register trademark	5	7, 15
21	Prepare product launch	15	13, 16, 17, 19FS + 25 days, 20FS + 15 days

FS = Finish to Start lag

Part 2

Remember the old saying, “A project plan is not a schedule until resources are committed.” This exercise illustrates this sometime subtle, but important point.

Using your files from Part 1, input resources and their costs if you have not already done so. All information is found in Tables A2.1 and A2.2.

Prepare a memo that addresses the following questions:

1. Which if any of the resources are overallocated?
2. Assume that the project is time constrained and try to resolve any overallocation problems by leveling within slack. What happens?
3. What is the impact of leveling within slack on the sensitivity of the network?

Include a Gantt chart with the schedule table after leveling within slack.

4. Assume the project is resource constrained and resolve any overallocation problems by leveling outside of slack. What happens?

TABLE A2.1**Resource
Assignments**

Activity	Resources
Need survey	MRKT (500%)
Set product specs	R&D (400%), MRKT (200%)
Shelf life report	R&D (300%)
Nutrition report	R&D (300%)
Select fruit suppliers	PURCH (100%)
Equipment rehab	ENG (1,000%), PROD (2,000%)
Production trials	PROD (1,500%), PURCH (100%), ENG (1,000%)
Quality trials	QUAL (300%), PROD (500%)
Quality metrics	QUAL (300%), PROD (100%)
Quality training	QUAL (300%), PROD (1,500%)
Market testing	MRKT (500%)
Package design	DESIGN (300%), MRKT (100%)
Select distributors	MRKT (500%)
Complete FDA certification	LEGAL (300%)
Register trademark	LEGAL (300%)
Prepare product launch	QUAL (300%), PURCH (200%), PROD (1,500%), MRKT (500%), ENG (500%), R&D (100%)

TABLE A2.2**Resources
Availability and Pay
Rates**

Resource	Abbrev	Available	Hourly rate
Marketing staff	MRKT	5	\$ 80/hr
R&D	R&D	5	\$ 80/hr
Engineering	ENG	10	\$100/hr
Purchasing	PURCH	2	\$ 60/hr
Quality engineers	QUAL	3	\$ 80/hr
Designers	DESIGN	3	\$ 60/hr
Legal staff	LEGAL	3	\$120/hr
Production	PROD	20	\$ 60/hr

Include a Gantt chart with the schedule table after leveling outside of slack.

Note: No splitting of activities is allowed.

Note: No partial assignments (e.g., 50 percent). All resources must be assigned 100 percent.

Part 3

Top management has accepted the July 19th completion schedule created at the end of Part 2. Prepare a brief memo that addresses the following questions:

1. How much will the project cost? What is the most expensive activity?
2. What does the cash flow statement tell you about how costs are distributed over the life span of the project?

Include a monthly cash flow for the project.

Once you are confident that you have the final schedule, save the file as a baseline.

Hint: Save a backup file just in case without baseline!

TABLE A2.3
Status Report
March 31, 2012

Activity	Actual Start	Actual Finish	Actual Duration	Remaining Duration
Need survey	1/3/12	2/2/12	22	0
Set product specs	2/3/12	2/28/12	18	0
Shelf life report	2/29/12	3/13/12	10	0
Nutrition report	3/14/12	3/19/12	4	0
Equipment rehab	2/29/12		23	12

Part 4 A

Assume that today is March 31, 2012, and Table A2.3 contains the tracking information for the project up till now. Enter this information into your saved baseline file and prepare a status report for the first three months of the POM+ project.

Your status report should also address the following questions:

1. How is the project progressing in terms of cost and schedule?
2. What activities have gone well? What activities have not gone well?
3. What do the PCIB and PCIC indicate in terms of how much of the project has been accomplished to date?
4. What is the forecasted cost at completion (EAC_p)? What is the predicted VAC_f ?
5. Report and interpret the TCPI for the project at this point in time.
6. What is the estimated date of completion?
7. How well is the project doing in terms of its priorities?

Try to present the above information in a form worthy of consideration by top management.

Include an Earned Value table and a Tracking Gantt Chart.

Note: Insert March 31, 2012, as the status date in the Project Information box.

Part 4 B

Assume that today is May 31, 2012, and Table A2.4 contains the tracking information for the project up till now. Enter this information into your saved baseline file and prepare a status report for the POM+ project.

Your status report should address the following questions:

1. How is the project progressing in terms of cost and schedule?
2. What activities have gone well? What activities have not gone well?
3. What do the PCIB and PCIC indicate in terms of how much of the project has been accomplished to date?
4. What is the forecasted cost at completion (EAC_p)? What is the predicted VAC_f ?
5. Report and interpret the TCPI for the project at this point in time.
6. What is the estimated date of completion?
7. How well is the project doing in terms of its priorities?

Try to present the above information in a form worthy of consideration by top management.

Include an Earned Value table and a Tracking Gantt Chart.

Note: Insert May 31, 2012, as the status date in the Project Information box.

TABLE A2.4
Status Report
May 31, 2012

Activity	Actual Start	Actual Finish	Actual Duration	Remaining Duration
Need survey	1/3/12	2/2/12	22	0
Set product specs	2/3/12	2/28/12	18	0
Shelf life report	2/29/12	3/13/12	10	0
Nutrition report	3/14/12	3/19/12	4	0
Select fruit suppliers	4/3/12	4/30/12	20	0
Equipment rehab	2/29/12	4/11/12	31	0
Production trials	4/17/12	5/4/12	14	0
Quality trials	5/7/12	5/31/12	18	0
Market testing	4/4/12	5/9/12	26	0
Package design	5/10/12	5/25/12	12	0
Select distributors	5/28/12		4	18
Complete FDA certification	5/11/12	5/31/12	14	0

Red Zuma Project

The ARC Company specializes in developing and selling a wide range of high-quality scooters. Sales representatives report that there is a growing demand for racing scooters. ARC's president, Robin Lane, is excited about the possibilities and predicts that one day these kinds of razor scooters will be featured in X-Game events. ARC is a small company and uses a strong matrix to optimally utilize limited manpower.

The Project Priority Matrix for the Red Zuma Project is:

	Time	Scope	Cost
Constrain		X	
Enhance	X		
Accept			X

Part 1

You are a member of a project team assigned to develop the new razor scooter code named "Red Zuma." Table A2.5 contains the information necessary to create a project schedule. For the purpose of this case assume the following:

1. The project begins January 2, 2015.
2. The following holidays are observed: January 1, Martin Luther King Day (third Monday in January), Memorial Day (last Monday in May), July 4th, Labor Day (first Monday in September), Thanksgiving Day (4th Thursday in November), December 25.
3. If a holiday falls on a Saturday, then Friday will be given as an extra day off, and if it falls on a Sunday, then Monday will be given as a day off. If December 25th falls on a Friday then Monday will not be given a day off.
4. The project team works eight-hour days, Monday through Friday.