

## PROJECT MANAGEMENT

2nd. Semester 2008/09

26.March.2009

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### I

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(Adapted from Meredith and Mantel, 2000)

The Denver Iron & Steel Company is expanding its operations to include a new drive-in weigh station. The weigh station will be a heated / air-conditioned building with a large floor and small office. The large room will have the scales, a 15-foot counter, and several display cases for its equipment.

Before erection of the building, the project the project manager developed its WBS, listing the activities and estimating the corresponding durations, as shown in the table below.

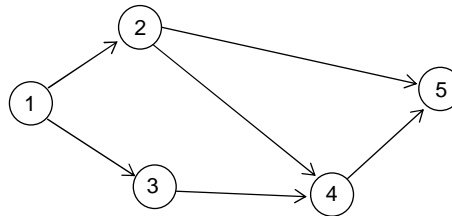
Activity	Activity description	Time estimates (days)			Preceding tasks
		Optimistic	Most Likely	Pessimistic	
A	Lay foundation	8	10	13	--
B	Dig hole for scale	5	6	8	--
C	Insert scale bases	13	15	21	B
D	Erect frames	10	12	14	A , C
E	Complete building	11	20	30	D
F	Insert scales	4	5	8	E
G	Insert display cases	2	3	4	E
H	Put in office equipment	4	6	10	G
I	Finishing touches	2	3	4	F, H

- a) Construct a network diagram for this project (is up to you to choose an A-o-A or a A-o-N type).
- b) Use the PERT analysis to find the critical path, the expected completion time and the slack times for the activities.
- c) The management of DI&S is expecting the new drive-in weigh stain to be in operation in 70 days. What is the probability that these expectations are met?
- d) Develop a schedule for this project avoiding the “as soon as possible” assumption but keeping in mind that the project is supposed to be finished in 70 days. Please state clearly what are your assumptions concerning the use of the overall slack time.

## II

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Consider the network in the A-o-A diagram below. The normal and crash points for each activity are given in the following table.



Activity	Normal		Crash	
	Duration (wks)	Cost (10 <sup>3</sup> EUR)	Duration (wks)	Cost (10 <sup>3</sup> EUR)
A (1,2)	8	100	6	200
B (1,3)	4	150	2	350
C (2,4)	2	50	1	90
D (2,5)	10	100	5	400
E (3,4)	5	100	1	200
F (4,5)	5	80	1	100

- Use marginal cost analysis to determine which activities should be crashed and what is the global cost to complete the project within 12 weeks.
- Formulate the same problem using the linear programming approach.

## III

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Part of the matrix mapping PM processes in the PMBOK is presented in Annex I (showing twelve of the forty-two processes). Please pick **TWO** of this processes, necessarily from different groups (columns), describe them briefly and illustrate them with examples from at least two different group presentations in class.

## IV

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Please answer either question IVa **OR** the six questions in group IVb.

### IVa

#### **Every Moment Counts in Airline Scheduling at Eastern**

(Adapted from Heizer & Render, 1991)

«When people think of airline scheduling, the first thing that comes to mind is how quickly a particular plane can safely reach its destination. But using ground time efficiency is just as important to an airline's timetable as the time spent in flight. Bill Rodenheizer is the manager of control operations for Eastern Airlines in Boston. He is considered to be an expert on airplane turnaround time, the process by which an airplane is prepared for almost immediate take-off once it has landed. He tells us how this well-orchestrated effort works:

Scheduling, to the airline, is just about the whole ballgame. Everything is scheduled right to the minute. The whole fleet operates on a strict schedule. Each of the departments responsible for turning around an aircraft has an allotted period of time in which to perform its function. Manpower is geared to the amount of ground time scheduled for the aircraft. This would be adjusted during off-weather or bad-weather days or during heavy traffic delays.

Most of our aircraft in Boston are scheduled for a 42.- to 65-minute ground time. Boston is the end of the line, so it is a "terminating and originating station". In plain talk, that means almost every aircraft that comes in must be fully unloaded, refueled, serviced, and dispatched within roughly an hour's time.

This is how the process works: In the larger aircraft, it takes passengers roughly 20 minutes to load and 20 minutes to unload. During this period, we will have completely cleaned the aircraft and unloaded the cargo, and the caterers will have taken care of the food. The ramp service may take 20 to 30 minutes to unload the baggage, mail, and cargo from underneath the plane, and it will take the same amount of time to load it up again. We double-crew those aircraft with heavier weights so that the work load will fit the time it takes passengers to load and unload.

While this has been going on, the fueler has fueled the aircraft. As to repairs, most major maintenance is done during the midnight shift, when all but 20 of Eastern's several hundred aircraft are inactive.

We all work under a very strict time frame. There are four functional departments. If any of the four cannot fit its work into its time frame, then it advises us at the control center, and we adjust the departure time or whatever, so that the other departments can coordinate their activities accordingly. »

How does this statement illustrate the use of Project Management? Identify as many references to the PM process groups and knowledge areas as you can.

## IVb

Please choose the (single) right answer to the following questions (right answer = .666; no answer = 0 ; wrong answer = - 0.222)

- 1. Four project managers are having lunch together and discussing their projects. Most of the time they are just complaining about how hard projects are to manage in their company. Some complain about the stakeholders and the number of changes they cause. Others talk about how hard it is to get people to cooperate and perform. One project manager wants to focus on the advantages of the matrix type organization they all work in for their projects. Which of the following would he mention?**
  - A. Improved project manager control over resources
  - B. More than one boss for project teams
  - C. Communications are easier
  - D. Reporting is easier
- 2. All of the following are characteristics of a project EXCEPT:**
  - A. Temporary
  - B. Definite beginning and end
  - C. Interrelated activities
  - D. Repeats itself every month
- 3. The project life cycle differs from the product life cycle in that the project life cycle:**
  - A. does not incorporate a methodology.
  - B. is different for each industry.
  - C. can spawn many projects.
  - D. describes project management activities.
- 4. The conclusion of a project phase is generally marked by a review of both key deliverables and project performance to date to determine if the project should continue into its next phase and?**
  - A. Obtain customer approval before continuing into next phase
  - B. Detect and correct errors cost effectively
  - C. Monitor actual work performed against the scope statement
  - D. Monitor actual work performed to the work breakdown structure
- 5. You are responsible for the communication controls for the X-Star series of government satellites. Your current assignment is:**
  - A. Project management
  - B. Functional management
  - C. Facility management
  - D. Program management
- 6. The project manager is making sure that the product of the project has been completed according to the project management plan. What part of the project management process is he in?**
  - A. Planning
  - B. Executing
  - C. Monitoring and controlling
  - D. Closing

## Annex I

Process Groups Knowledge Area	Initiating	Planning	Executing	Controlling	Closing
4. Project <b>Integration</b> Management	Develop Preliminary Project Scope Statement				
5. Project <b>Scope</b> Management		Scope Definition			
6. Project <b>Time</b> Management		Schedule Development		Schedule Control	
7. Project <b>Cost</b> Management		Cost Budgeting		Cost Control	
8. Project <b>Quality</b> Management				Perform Quality Control	
9. Project <b>Human Resource</b> Management		Human Resources Planning			
10. Project <b>Communications</b> Management			Information Distribution	Performance Reporting	
11. Project <b>Risk</b> Management		Risk Response Planning			
12. Project <b>Procurement</b> Management		Plan Contracting			

**SOME of the Project Management Processes mapped to the Process Groups and Knowledge Areas**