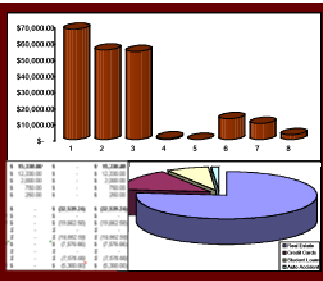
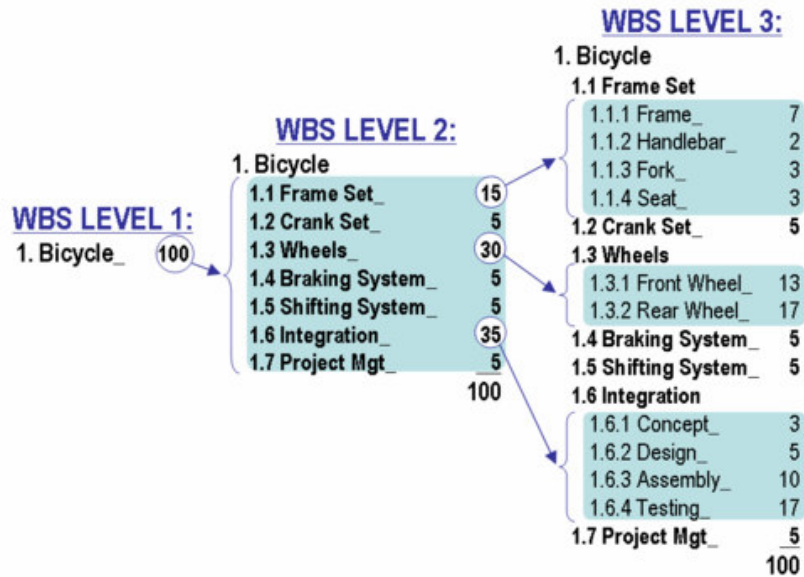


## Week 9: Project Management

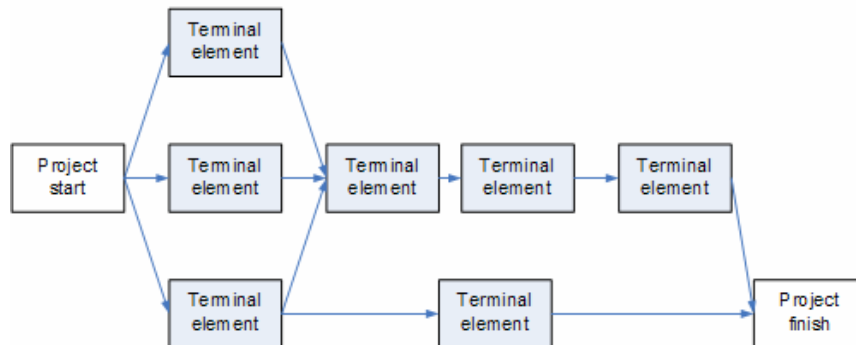
- ✓ Quiz:
  - Project management focuses on managing three things: scope, schedule, and budget. In one sentence or less, write a definition for the words “scope,” “schedule,” and “budget” as they relate to a project.
  
- ✓ Quiz for next week:
  - List five examples of different queues that you deal with regularly. (Creative answers are encouraged.)
  
- ✓ Assignments due this week:
  - Biography: Pythagoras
  - Linear Programming Spreadsheet: Build a spreadsheet that solves a function with at least two variables and two constraints.
  
- ✓ Assignments due next week:
  - Biography: Frederick Winslow Taylor
  - WBS Spreadsheet: Pick a project that you have managed, will manage, or would like to manage. Create a spreadsheet that allows you to track the tasks and subtasks. Include columns for task description, start and finish dates, costs, resources, and other fields that you think would be important for planning and managing your project. Use Excel functions to provide summary information. For example, use min() and max() to automatically determine the start and finish dates, and use sum() or subtotal() to calculate the total cost.
  - Transportation Spreadsheet: Create a spreadsheet to solve a transportation problem involving three factories and three warehouses.
  
- ✓ Projects vs. Processes
  - A project always has a defined beginning and a definite ending.
  - A process is repetitious and ongoing.

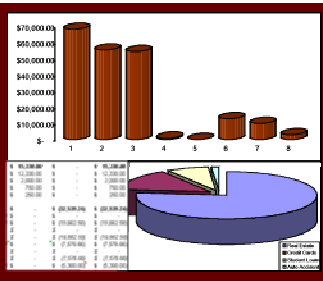


- ✓ Key Elements for Project Management
  - Scope
    - What you are supposed to do.
    - How you are supposed to do it.
  - Schedule
    - When you are supposed to start and finish.
  - Budget
    - What resources you have to work with.
  
- ✓ Project Management Tools (Illustrations from Wikipedia)
  - Work Breakdown Structure (WBS)

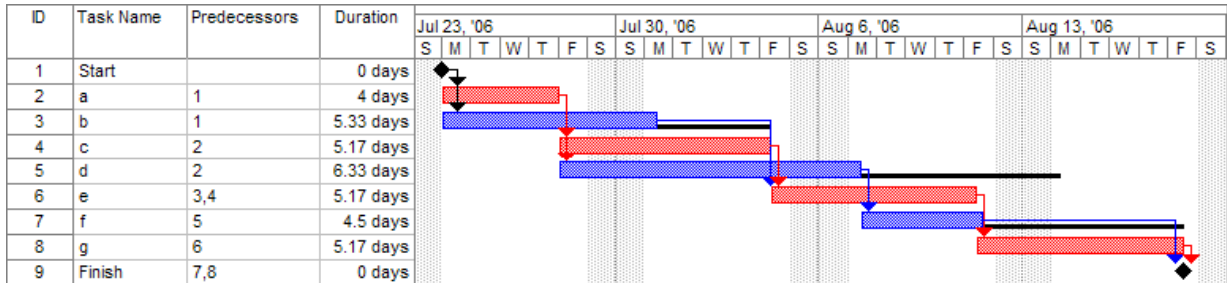


- Network Diagram
  - Predecessors and Dependencies

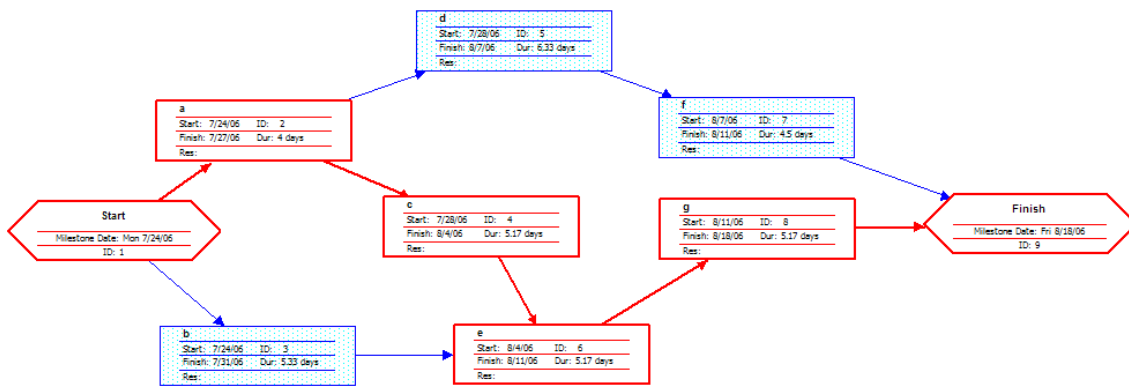




○ Gantt Chart



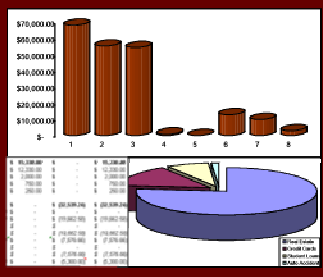
○ PERT Analysis and Critical Path Method



○ MS Project

✓ DIRECT Approach to Project Management

- Define the Objective or Opportunity
  - Brainstorming – Free flow of ideas.
- Investigate the situation and consider options
  - Research.
- Resolve to a Course of Action
  - Methodical planning – PERT, Gantt, WBS.
- Execute the Plan
  - Energy, communication, coordination. Tracking Gantt, CPM.
- Change Over to the New System
  - Attention to detail. Contingency preparation.
- Transition to the New Approach
  - Training and selling people on the new stuff



✓ Example: Transportation Problem

- We've been hired by a company that manufactures candy. They make the same style of candy at three of their factories across the country. The factories are located in Miami, Seattle, and New York. Once it has been made, the candy must be shipped from the factories to warehouses. The warehouses are located in Atlanta, St. Louis, and Chicago. Their goal is to manufacture and ship 385 pieces of candy next month. But each factory has a limit to the number of pieces it can make, and each warehouse has a limit to the number of pieces it can store. These limitations are summarized in the table below:



Factories		Warehouses	
Location	Capacity	Location	Capacity
Miami	93	Atlanta	145
Seattle	196	St. Louis	125
New York	96	Chicago	115
<b>Total</b>	<b>385</b>	<b>Total</b>	<b>385</b>

Our client has provided us with a chart that shows the distances between each factory and each warehouse:

	Distances (in miles)		
	Atlanta	St. Louis	Chicago
Miami	662	1,217	1,380
Seattle	2,676	2,123	2,099
New York	884	951	790

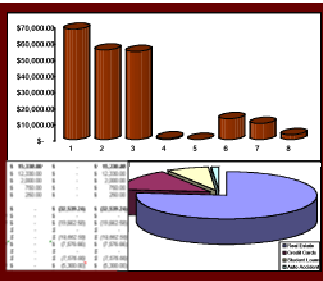
Currently, they estimate that it costs them about \$0.01 per mile to ship each piece of candy.

We need to decide how to distribute all of their candy production to the warehouses while minimizing transportation costs. We would like to provide them with a system so that they can make these decisions on their own in the future. What should we do? How could we perform a sensitivity analysis on our results?

# QUANTITATIVE METHODS FOR MANAGEMENT DECISIONS

## NATIONAL AMERICAN UNIVERSITY

### MA 6600 - WINTER 2007



	A	B	C	D	E	F
1	<b>N&amp;R Candy Company Transportation Problem</b>					
2						
3	<b>Factories</b>			<b>Warehouses</b>		
4	Location	Capacity		Location	Capacity	
5	Miami	93		Atlanta	145	
6	Seattle	196		St. Louis	125	
7	New York	96		Chicago	115	
8	<b>Total</b>	<b>385</b>		<b>Total</b>	<b>385</b>	
9						
10						
11	<b>Distances (in miles)</b>					
12		Atlanta	St. Louis	Chicago		
13	Miami	662	1,217	1,380		
14	Seattle	2,676	2,123	2,099		
15	New York	884	951	790		
16						
17						
18	Cost per Mile:	\$ 0.01				
19						
20	<b>Cost (per Unit)</b>					
21		Atlanta	St. Louis	Chicago		
22	Miami	\$ 6.62	\$ 12.17	\$ 13.80	\$	32.59
23	Seattle	\$ 26.76	\$ 21.23	\$ 20.99	\$	68.98
24	New York	\$ 8.84	\$ 9.51	\$ 7.90	\$	26.25
25	<b>Total</b>	<b>\$ 42.22</b>	<b>\$ 42.91</b>	<b>\$ 42.69</b>	<b>\$</b>	<b>127.82</b>
26						
27	<b>Number Shipped</b>					
28		Atlanta	St. Louis	Chicago		
29	Miami	93	-	-		93
30	Seattle	-	125	71		196
31	New York	52	-	44		96
32	<b>Total</b>	<b>145</b>	<b>125</b>	<b>115</b>		<b>385</b>
33						
34	<b>Cost (Total)</b>					
35		Atlanta	St. Louis	Chicago		
36	Miami	\$ 615.66	\$ -	\$ -	\$	615.66
37	Seattle	\$ -	\$ 2,653.75	\$ 1,490.29	\$	4,144.04
38	New York	\$ 459.68	\$ -	\$ 347.60	\$	807.28
39	<b>Total</b>	<b>\$ 1,075.34</b>	<b>\$ 2,653.75</b>	<b>\$ 1,837.89</b>	<b>\$</b>	<b>5,566.98</b>

**Solver Parameters**

Set Target Cell:  Solve

Equal To:  Max  Min  Value of:  Close

By Changing Cells:  Guess

Subject to the Constraints:

\$C\$29:\$E\$31 = integer

\$C\$29:\$E\$31 >= 0

\$C\$32 = \$F\$5

\$D\$32 = \$F\$6

\$E\$32 = \$F\$7

\$F\$29 = \$C\$5

Add Change Delete Options Reset All Help