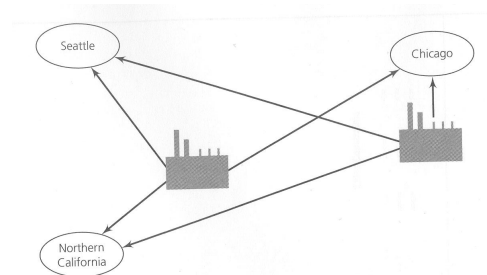


SCH-MGMT 752
Department of Operations & Information Management
Isenberg School of Management, UMass Amherst

Ajax presently has a production facility in Chicago where its principal market share is located. Business is growing, and 2 new markets are emerging in California and Seattle. Ajax is planning for the coming 3 years. You have been hired by Ajax as a consultant to investigate the following strategic decisions.

- Should Ajax open a new production facility in Sunnyvale, California, and if so, in what year (1, 2, or 3)?
- Should Ajax invest in a major expansion of its Chicago facility, and if so, in what year?
- Should Ajax invest in developing a new product, “Delta” laptops, and if so, should it assign it to the plant at Chicago, or to the potential plant at Sunnyvale?
- What quantity of each product to produce at each plant in each time period? Which plant should serve each market for each product in each time period?



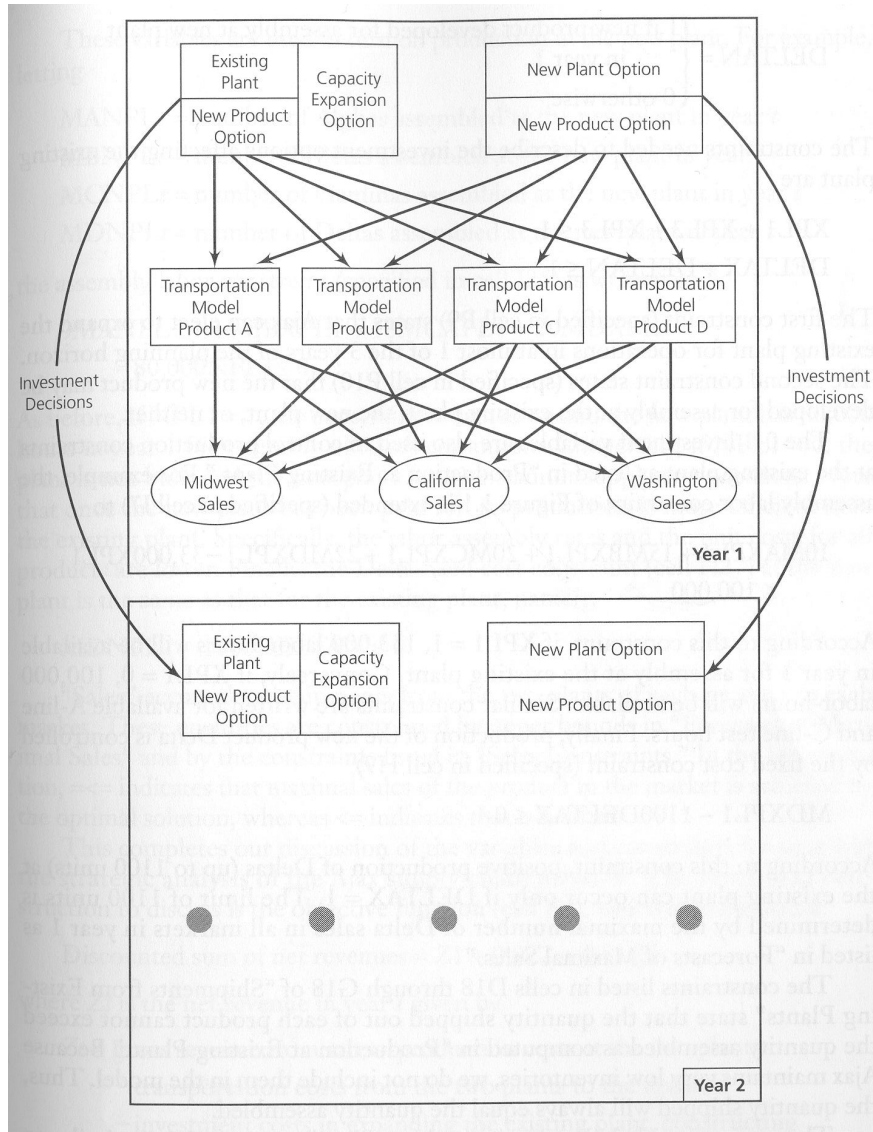
Some assumptions:

- Capacity of Chicago plant is expanded in either first, second, or third year, if at all.
- New product, Delta, may be developed for assembly in year 1 at the existing plant only, the new plant only, or neither.

Unit revenue: \$1,350, \$1,650, \$3,000, and \$2,500 for Alpha, Beta, Gamma, and Delta, respectively.

Chicago plant (existing facility):

- A-line test: Alphas and Betas; 1 hour for any Alpha or Beta tested. Capacity w/o expansion: 6,000 hrs. Capacity after expansion: 8,000 hrs.
- C-line test: Gammas and Deltas; 1 hour for any Gamma or Delta tested. Capacity w/o expansion: 2,400 hrs. Capacity after expansion: 3,200 hrs.



Year 1				
	Alpha	Beta	Gamma	Delta
Chicago	3000	2000	2000	500
California	1500	1000	500	300
Seattle	1200	1000	750	300
Year 2				
	Alpha	Beta	Gamma	Delta
Chicago	6000	1000	2000	1000
California	2000	500	1000	600
Seattle	1800	500	1500	600
Year 3				
	Alpha	Beta	Gamma	Delta
Chicago	3000	2500	2000	2000
California	1000	1500	1000	1500
Seattle	1000	1200	1500	1200

Table 1: Forecasts of Maximal Sales

From Chicago to Markets				
	Alpha	Beta	Gamma	Delta
Chicago	22	19	27	27
California	52	48	58	58
Seattle	50	46	56	56
From New Plant to Markets				
	Alpha	Beta	Gamma	Delta
Chicago	72	48	58	58
California	20	17	25	25
Seattle	30	26	35	35

Table 2: Unit Shipment Costs

- Assembly line: 10 hrs for 1 Alpha, 15 hrs for 1 Beta, 20 hrs for 1 Gamma, 22 hrs for 1 Delta. Capacity w/o expansion: 100,000 hrs. Capacity after expansion: 133,000 hrs.
- Unit cost: \$1,000, \$1,175, \$2,250, and \$2,100 for Alpha, Beta, Gamma, and Delta, respectively.
- Expansion cost in any year: \$834,000.
- Fixed cost for developing Delta at Chicago plant: \$775,000.

New plant:

- A-line test: Alphas and Betas; 1 hour for any Alpha or Beta tested. Capacity expansion: 5,000 hrs.
- C-line test: Gammas and Deltas; 1 hour for any Gamma or Delta tested. Capacity expansion: 2,000 hrs.
- Assembly line: 9 hrs for 1 Alpha, 14 hrs for 1 Beta, 18 hrs for 1 Gamma, 20 hrs for 1 Delta. Capacity expansion: 80,000 hrs.
- Unit cost: \$925, \$1,100, \$2,125, and \$1,900 for Alpha, Beta, Gamma, and Delta, respectively.
- Opening plant in any year: \$2,225,000.
- Fixed cost for developing Delta at new plant: \$775,000.