

3. What are your recommendations regarding the company policy of offering all its customers the same service level (three-day fulfillment cycle)?

Note: The company's cost of capital for both borrowing and lending can be estimated at 9 percent. Ignore tax effects on all transactions.

CASE 12

Johnson Skin Care Products

Johnson Skin Care Products is a manufacturer of men's and women's organically based skincare products. The company is based in Kentucky and has developed several new and exciting products for sales through retail stores in the U.S. market. Historically, the company has distributed its products to the institutional market. Its direct customers included spas, hair salons which provide services such as facial treatments, and other such businesses. These customers had been enthusiastic in their reception of Johnson products and sales have grown rapidly. The most recent year sales were slightly over \$36 million and operating profit was over \$4.8 million. The company's Return on Assets, measured as Operating Profit divided by Invested Capital, was an admirable 28 percent.

After considerable market research, the company decided to enter a more traditional market by selling and distributing its products through a network of retail stores for sale to consumers. Being new to this type of channel, the company president, Jim Johnson, hired Bob Bassett into a new position at the firm, Director of Logistics. Bob is a relatively young man, age 34, who received an MBA with a concentration in supply chain management from a major Midwestern university. Following college he worked for six years in several different positions at a large health and beauty aid manufacturer. Bob had progressed rapidly in his short career and Jim felt confident in his choice despite Bob's youth.

Bob settled into his new position, spending the first few weeks familiarizing himself with the company's and current operations. He learned that Johnson Skin Care's product line consisted of slightly over 100 SKU's but the vast majority of sales were accounted for by three

	WFC	MFC	BB
Annual sales	\$15,000,000	\$4,500,000	\$2,000,000
Avg. unit price	\$5.00	\$4.50	\$6.25

TABLE 1
Forecast Sales and
Selling Prices

product categories: women's foot care (WFC), men's foot care (MFC), body butter (BB). It was expected that the same sales pattern would be true in the new distribution channel. The market research team had developed an initial year forecast for the new channel (Table 1) based on expected average unit selling price to the retailer for these three categories.

Having worked in a large manufacturer before joining Johnson Skin Care, Bob was not surprised to learn that the primary components of each of these products were quite similar to each other. While there are other minor ingredients costing only a few cents each, the five major components consist of:

- Bottle
- Shea Butter
- Ocean Mist Scent
- Fresh Sky Scent
- Mountain Air Scent

Each product is made of three or more of these components:

- WFC is comprised of Bottle, Shea Butter, and Ocean Mist Scent.
- MFC is comprised of Bottle, Shea Butter, and Fresh Sky Scent.
- BB is comprised of Bottle, Shea Butter, and a combination of both Fresh Sky and Mountain Air.

The manufacturing cost of each product can be determined from the data in Table 2. These costs include the contract manufacturer's profit margins.

Bob visited each facility in Johnson's current supply chain. The company uses two contract manufacturers to actually mix the ingredients, bottle and package the finished products. The two contract manufacturers are located in New Jersey and California. The California plant produces WFC. The New Jersey plant produces MFC and BB. All products are single sourced, so neither of the plants produces the same product within a category. Table 3 provides case pack information from the plants.

The company has three staging warehouses (SWs) located in New Jersey, Kentucky and California. Regional demand has been aggregated into five regional distribution centers

Bottle	\$0.60
Shea Butter	\$0.80
Ocean Mist	\$0.25
Fresh Sky	\$0.20
Mountain Air	\$0.30
Labor	\$0.40
Packaging	\$0.50

TABLE 2
Manufacturing Cost
Data

	Avg. Units per Carton	Volume per Carton (cub. M)
WFC	27	0.05
MFC	12	0.034
BB	20	0.05

TABLE 3
Case Pack Data

TABLE 4
Forecast Demand by
Region

North East	Midwest	South	Northwest	Southwest
30%	20%	30%	5%	15%

TABLE 5
Transportation Cost
per Truckload

Plants to SW	New Jersey	Kentucky	California		
New Jersey	\$ 100	\$ 600	\$2000		
California	\$2,000	\$1,700	\$2000		
SW-DC	North East	Midwest	South	Northwest	Southwest
New Jersey	\$ 100	\$ 800	\$1,000	\$5,000	\$5,500
Kentucky	\$ 700	\$ 200	\$1,500	\$3,000	\$3,500
California	\$5,000	\$3750	\$3,250	\$ 600	\$ 300

(DCs). Each plant ships its production to the staging warehouses which, in turn, ship to the five regional distribution centers. Any staging warehouse can ship to any distribution center. The forecasted demand by region is provided in Table 4.

Transportation lanes from the plant to staging warehouses and from staging warehouses to the regional distribution centers will consist of full truck loads. A full truck contains of 100 cubic meters. Johnson Skin Care products typically weigh-out a truck before cubing out a truck. The products will only fill 70 percent of a truck's cubic capacity before it weighs out. Bob spent considerable time researching transportation cost data and developed Table 5 regarding transportation cost.

The distribution centers will deliver to stores throughout the United States. Bob felt that he could omit that cost for the moment as he pondered what the total cost of distribution. There are several alternative networks, particularly related to the assignment of staging warehouses to distribution centers. To complete his analysis, he assumed that the overall inventory turnover rate would be five per year. He also knew that Johnson Skin Care historically had an inventory carrying cost of 18 percent based on average inventory for the year.

Questions

1. Develop a flow diagram depicting all of the possible supply chain flows,
2. What supply chain network would you recommend to Bob Bassett based on the current four echelon structure (plant → SW → DC → Store)?
3. If you could modify the current supply chain strategy, what would you change and why?

CASE 13

DOW Greenhouse Gas Emission Scenario Study¹

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An increasing number of studies in the area of environmental research indicate that the earth's environment is at risk due to human activities. The research specifically points

¹The authors would like to thank The Dow Chemical Company for preparing the case and granting permission to include this case in the textbook.