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TOFFEE INC.: DEMAND PLANNING FOR CHOCOLATE BARS

In March 2011, Vishal Ramani, the inventory manager of sales and distribution for Toffee Inc., a confectionery company, had just concluded a meeting with all relevant personnel. The meeting had not been entirely positive. The words of the production manager still echoed in his ears: “If the ingredient inventory that was purchased and managed by the firm is not re-examined and re-worked to the firm’s advantage then [soon] the final products based on these ingredients will cease to yield the kind of profits that the firm expects.”

Ramani’s task was to prepare a comprehensive forecasting and inventory management plan with a view to minimize the cost of managing the supply chain by judicious use of resources, better forecasting, and improvement in the ingredient inventory purchasing and management systems. Most importantly, he had to decide how much and when to order the ingredients involved in one of the company’s most popular products, the “Seven Star” chocolate bar.

THE COMPANY

Toffee Inc. was a confectionery company working out of the Maharashtra Industrial Development Corporation (MIDC), Amgaon, Maharashtra. The company began its operations in 1990, and was fairly well known in the region. Since 2008, Toffee Inc. had been making thousands of confectionery products, and the core competitiveness of its operations lay in its adaptability to customers’ tastes and preferences.

The company had come a long way from its inception. Hansmukhlal Jadhwani (the owner and sole proprietor of the firm) established Toffee Inc. with his two younger brothers. Jadhwani started small, beginning his career as a wholesale trading agent for confectionery and other bakery items. The business was successful and soon Jadhwani turned from trading to small-time production of toffees and candies. As the business started to take off, it expanded the existing manufacturing unit into a modern confectionery processing unit with allied products like chocolates, gums, candies, bars, etc.

SALES AND DISTRIBUTION

Toffee Inc. had six depots, approximately 50 authorized dealers and a sales force of around 85 people. Its sales and distribution network, operated from Nagpur, had a direct or indirect reach to almost all the towns and cities in the states of Maharashtra, Madhya Pradesh, Chhattisgarh, Orissa and West Bengal. The firm was working on a management information system for garnering all data and information generated and reported by the sales force in different parts of the country.

THE CONUNDRUM

Toffee Inc. produced a number of candies and toffees, including the most expensive of its products, a chocolate bar branded Seven Star. It was also one of the most popular Toffee Inc. products. The retailers sold the product loose but the company packaged it in bags of 20 bars each. These bags were then packaged into cartons of 100 bags each. Seven Star had different ingredients from the normal toffees and candies produced by Toffee Inc., including dark chocolate, cocoa butter, cocoa powder, nuts, condensed milk and sugar glucose. Each chocolate bar weighed 30 grams. In order to maintain the high quality of the product, Toffee Inc. was forced to use high-grade, fresh ingredients, thus ensuring that there was not a large inventory of Seven Star bars. However, this meant that the product could not remain in storage for an extended period of time.

The sales and distribution team at Toffee Inc. were aware that the demand of this flagship brand followed a seasonal variation. It had reviewed the last five years' sales records and concluded that the demand peaked during the festivals and marriage seasons (see Exhibit 1).

Toffee Inc.'s sales and distribution branch managed the regions and was responsible for transportation, stocking and distribution. Primary distributors were concerned about the sales and distribution as they had experienced very impactful seasonal variations in the products that they bought and sold. The shipments took around 15 days to arrive from the day of placing the order. Because of the nature of the food product, it needed careful handling and had to be transported and stored in climate-controlled environments. The ordering cost was relatively high as the product traversed long distances across India and the need for climate-controlled environments (like air-conditioning and refrigeration) added to the cost, which amounted to INR8,000 per order. This included cost of communication, paper trails, service and other taxes, and all kind of octroi[1] clearances. The monthly carrying cost of the cartons amounted to 2.5 per cent of the cost of the goods. According to company records, the cost of each carton was INR1,200.

Issues at the Sales and Distribution Level

In planning the ordering and inventory for the year, Ramani's decision became even more complex because the sales and distribution team needed to determine what levels of stock should be maintained to keep meeting the expected service levels of 95 per cent. For this purpose, the store's manager scouted, collected and compiled the data from 2006 to 2010 along with other information pertaining to all the factors/parameters that would help the company make an informed decision.

Seven Star was prepared using four primary ingredients: dark chocolate (7.8 grams per bar), cocoa butter (6.2 grams per bar), cocoa powder (5.1 grams per bar), and dry fruits and nuts (4 grams per bar). In addition, there were other secondary ingredients needed (such as condensed milk, sugar glucose, etc.) but

[1] *A local tax on various goods brought into a district for consumption.*

the proportions of these ingredients, though vital to the taste, were not weighed for their exactness and were simply bracketed under the “other ingredients” category.

There were different suppliers and vendors for each of the four main ingredients. The average costs associated with each ingredient (considering all the suppliers and vendors for various parameters like annual ordering costs, annual carrying costs, unit costs of the items with different levels of quantity procured, etc.) were available to the production team (see Exhibits 2 to 5).

THE MEETING AND THE COURSE OF ACTION

A high-level executive meeting was called at the Toffee Inc. main office. The core agenda of the meeting was to discuss the twin issues of managing the purchase decisions on two fronts: 1) At the level of the company — the sales and distribution branch had to decide on the expected sales for 2011, based on past performances, and choose the right order size considering all the data available through various records and databases; 2) At the level of the vendors — Toffee Inc. had to confront the problem of order quantity for the ingredients supplied by the vendors while factoring in various information, such as the bulk discounts available, cost of orders, cost of holding, etc. The goal was to minimize the annual cost of purchase by selecting the right quantity, which satisfied all the needs of the firm.

As Ramani contemplated his task with respect to ordering the ingredients of Seven Star, other related questions circled his mind: What were the short-term and long-term implications of these quantitative decisions on inventory management and other aspects of effectiveness, like quality and supply chain?

EXHIBIT 1: DEMAND FOR SEVEN STAR (NUMBER OF CARTONS SOLD)

YEAR	2006	2007	2008	2009	2010
JAN	742	741	896	951	1030
FEB	697	700	793	861	1032
MAR	776	774	885	938	1126
APR	898	932	1055	1109	1285
MAY	1030	1099	1204	1274	1468
JUN	1107	1223	1326	1422	1637
JUL	1165	1290	1303	1486	1611
AUG	1216	1349	1436	1555	1608
SEP	1208	1341	1473	1604	1528
OCT	1131	1296	1453	1600	1420
NOV	971	1066	1170	1403	1119
DEC	783	901	1023	1209	1013

Source: Company records.

EXHIBIT 2: COST DATA AVAILABLE FOR COCOA POWDER

Holding cost (% of the cost/year)	40%
Ordering cost (INR/order)	1000
Quantity in kg	**Price (INR/kg)**
1 to 2000	120.30
2001 to 4000	120.20
4001 to 6000	120.10
ABOVE 6000	120.00

Source: Company records.

EXHIBIT 3: COST DATA AVAILABLE FOR COCOA BUTTER

Holding cost	30%
Ordering cost (INR/order)	1200
Quantity in kg	**Price (INR/kg)**
1 to 1000	72.06
1001 to 2000	72.05
2001 to 3000	72.03
ABOVE 3000	72.02

Source: Company records.

EXHIBIT 4: COST DATA AVAILABLE FOR DARK CHOCOLATE

Holding cost	35%
Ordering cost (INR/order)	800
Quantity in kg	**Price (INR/kg)**
1 to 1250	105.30
1251 to 2500	105.30
2501 to 3570	105.25
ABOVE 3750	105.20

Source: Company records.

EXHIBIT 5: COST DATA AVAILABLE FOR DRY-FRUITS AND NUTS

Holding cost	25%
Ordering cost (INR/order)	2100
Quantity in kg	**Price (INR/kg)**
1 to 2500	90.00
2501 to 5000	90.20
5001 to 7500	90.15
ABOVE 7500	90.10

Source: Company records.