

Typically, he will obtain the model from another local dealer. What are the disadvantages to the retailer?

4. Discuss five ways that the lead times within a supply chain can be reduced.
5. Consider the supply chain for breakfast cereal. Discuss the competing objectives of the farmers who make the raw materials, the manufacturing division of the company that makes the cereal, the logistics division of the company that makes the cereal, the marketing division of the company that makes the cereal, the distribution arm of the grocery chain that sells the cereal, and the manager of an individual grocery store that sells the cereal.
6. Consider Example 5-1 and discuss strategies that could help Newbury Comics and SoundScan Inc. solve the misalignment problem.



Reebok NFL Replica Jerseys: A Case for Postponement

"This time of year is a little too exciting for us. I have a warehouse full of jerseys out there and retailers are screaming for the teams and players I don't have! Every year, it seems like we have the right mix of inventory going into the season, and then some team that no one expected to do well gets off to a 4-0 start, and the team everyone expected to contend for the Super Bowl is losing games. Suddenly I have 1000s of jerseys I can't sell and 1000s of orders I can't fill."

Tony is responsible for the inventory of NFL replica jerseys that Reebok maintains in their central distribution center. It is early October, and the NFL season is well underway. "No wonder we call this the chase; I feel like I have been running for months; I'm exhausted. I wish there was some way to plan inventory that would allow me to react faster to hot players and teams. But with player demand changing so much from year to year, I really can't increase inventory; in fact I like to minimize inventory at year-end."

BACKGROUND

Reebok International Ltd. is headquartered in Canton, Mass. The company employs approximately 7,400 people, and is widely known for their sports apparel and footwear brands. Reebok was a small British shoe company in 1979, when Paul Fireman acquired the exclusive North American license to sell Reebok shoes.⁴ In 1985 Reebok USA acquired the original

British Reebok, and Reebok International went public. Reebok in 2003 had total revenues of \$3485 M and realized income from operations of \$157 M. Paul Fireman continues to be the chairman and CEO.

In December 2000 Reebok signed a 10-year contract with the National Football League (NFL) that granted an exclusive license to Reebok to manufacture, market, and sell NFL licensed merchandise including on-field uniforms, sideline apparel, practice apparel, footwear, and an NFL-branded apparel line. The National Football League is the premier professional league for American football, consisting of 32 teams. Teams are organized in two conferences, the American Football Conference (AFC) and the National Football Conference (NFC), and in four divisions within each conference.

The history of American football traces back to 1869.⁵ The Arizona Cardinals are the oldest continuing operation in pro football, dating back to 1899. In 2003, the Super Bowl between the Tampa Bay Buccaneers and the Oakland Raiders received over 139M viewers, making it the most watched television program in history. From its humble beginnings, the NFL has grown into a very successful league.

Source: Copyright 2005, John C. W. Parsons. This case was prepared by John C. W. Parsons under the direction of Professor Stephen C. Graves as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. The case is based on the author's MLog thesis, "Using a Newsvendor Model for Demand Planning of NFL Replica Jerseys" supervised by Professor Stephen C. Graves, June 2004.

⁴ www.reebok.com/useng/history/1890.htm.

⁵ www.nfl.com/history.

LICENSED APPAREL BUSINESS

The Licensed Apparel Business is a high margin and lucrative business. In granting an exclusive license to Reebok, the NFL expects Reebok to provide a very high level of service to its customers, the sports retailers who ultimately sell to the public. However, demand is influenced by many uncontrollable factors and is extremely hard to predict; forecasting which items will sell is akin to forecasting who will be the Most Valuable Player in next year's Super Bowl.

Reebok has a history of delivering quality products. One retailer states, "The Reebok line is great. We're excited and anxious at the same time. [In the past] the fear was that one team jersey could be found from five different manufacturers at five different stores in the mall. Now the [question] is, will the consumer have to pay an extra \$20 for a team jersey because it is from Reebok?"⁶

Yet other retailers worry about having a sole source for these products. "As a top-tier retailer in apparel, we'll only have access to that one brand," says another retailer. "I think that Reebok makes great product. We just hope they can deliver because we won't have options B, C, or D to go to."⁷

Of particular importance is Reebok's ability to deliver *hot-market* items, a concern for retailers in all areas of the licensed business. "I think with one major partner in Reebok we are in a better position for hot-market items. . . . Reebok will be able to take a larger position in blanks on jerseys and fleece and feel more confident that they can meet the demands of retailers."⁸

A *hot-market* item, in the context of the NFL replica jersey business, is an item that was either not expected to sell well before the season or an unknown item that had no prior sales expectations. Early reviews of Reebok show that their performance has been satisfactory. "To be fair, in hot markets delivery is always going to be an issue. Whether you have 12 companies or one, it will always be an issue. And I have to say, this year, Reebok has been pretty much on-time with their deliveries."⁹

Reebok developed its expertise in Licensed Apparel through acquisition and expansion. In 2001 Reebok purchased a relatively small licensed apparel business, LogoAthletic, located in Indianapolis. LogoAthletic had extensive experience and expertise in sports apparel, as well as past relationships with the NFL. As a consequence, Reebok decided to locate its Licensed Apparel management at the former LogoAthletic facilities in Indianapolis.

DEMAND FOR NFL REPLICAS JERSEYS

The NFL replica jersey consists of a 5-ounce nylon diamond back mesh body, a nylon dazzle sleeves/yoke in the team color and white, and a 8.6-ounce polyester flat knit rib collar, and stripe knit inserts for select teams. Each team's jersey is a distinct combination of style, cuts, and colors (team color, white, and alternate) along with the team logo, (see Figure 5-9 for examples).

Although the consumer demand for jerseys is year-round, the NFL season drives much of the demand. Sales are highest in August and September in anticipation of the season. As the season starts, certain teams and players get a sales bump due to their performances. For example, in 2003 the Kansas City Chiefs started the season with a series of wins, and their jerseys became *hot-market* items, creating shortages. Previously unknown players sold unexpectedly well: Dante Hall made several outstanding plays in the first four games, creating a hot-market for his jersey.

Later in the season, consumer demand is driven by holiday presents and the anticipation of the playoffs. During the playoffs the demand is strongly correlated to weekly performance. A team that loses sees its sales disappear, while teams that win and continue to play experience strong sales. The two Super Bowl teams sell much higher than normal up to the game. The Super Bowl winner continues to sell for one to two weeks following the championship, but then sales decline rapidly until the start of the next season.

Most player trades and free agent signings occur during the off season of February to April. Consumers react to these player movements by demanding the newest superstar jersey for their favorite team. For instance, when Warren Sapp signed with the Oakland Raiders in March 2004, retailers expected Reebok to start shipping his jersey immediately.

⁶ Cara Griffin, "NFL's New World Order," *Sporting Goods Business* 35, no. 1 (Jan. 2002) p. 56.

⁷ *Ibid.*

⁸ *Ibid.*

⁹ *Ibid.*



FIGURE 5-9 Examples of NFL replica jerseys.

SALES CYCLE

The annual sales cycle starts in January/February. Reebok offers retailers a discount to place early orders that result in retailers placing approximately 20 percent of annual orders for planned delivery in May. Reebok uses the advance-order information to plan purchases from their suppliers for the upcoming season.

There is limited ordering by the retailers between February and April except for some order adjustments; for instance, retailers place orders for short lead-time delivery to meet unexpected demand due to player movements, for example, the signing of Terrell Owens by Philadelphia in 2004.

Retail orders placed between May and August are primarily to position inventory in the retail distribution centers (DCs) to meet the in-season replenishment requirements from the retail outlets; the lead-time expectations at this point are 3 to 4 weeks. By the end of August, Reebok has shipped 50 percent of anticipated sales to retailers.

The in-season replenishment period between September and January is known as "The Chase." For the jerseys that are selling according to the preseason

forecasts, retailers use their DC inventory to replenish the stock at their stores. But the retailers need to place replenishment orders with Reebok for strong sellers to restock their DC inventories. This is the time when consumers react to player and team performance and create hot markets. Retailers need to adjust their inventories to "chase" the hot-market items, and they expect Reebok to supply product to chase the hot markets. Unknown players become superstars, and former superstars become nonfactor players. There is an opportunity for retailers to sell through high volumes of product if they can stock the correct players to match the consumer demand.

A senior purchasing manager at a large sports retailer explains, "We really need to anticipate what teams and which players will be popular this season, and ensure that they have inventory on hand. We replenish in-store inventory as required on a weekly basis from the DC."

SUPPLY CHAIN

Reebok supplies directly the distribution centers for its major retailers from its DC in Indianapolis.

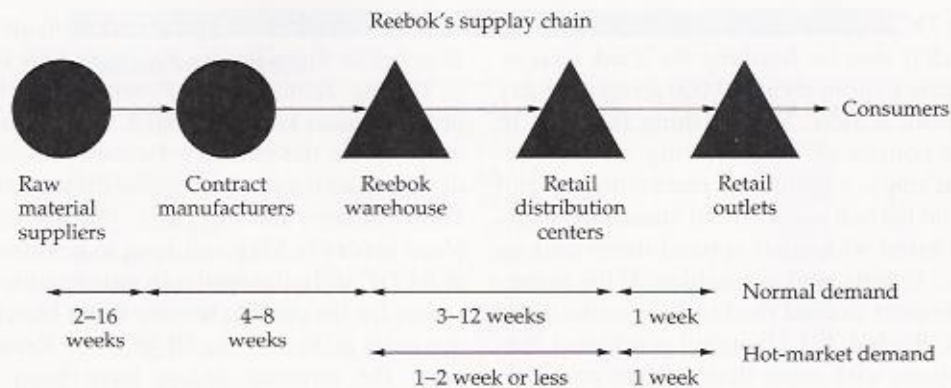


FIGURE 5-10 Reebok's supply chain.

Retailers expect lead times between 3 and 12 weeks for replenishment of normal demand, but expect much shorter lead times of 1 to 2 weeks when faced with hot-market demand.

Figures 5-10 and 5-11 provide a high-level depiction of Reebok's supply chain. Reebok sources all jerseys from offshore contract manufacturers (CM) with a manufacturing lead time of 30 days. Reebok procures the fabric and raw materials that are held in inventory by each CM. Internal contracts are in place to ensure sufficient levels of raw material inventory to provide capability to produce any team on demand, if required. Shipping takes two months for ocean shipping or one week via air.

The contract manufacturers cut, sew, and assemble a finished team jersey with team colors and markings, but without a player name or number. This is called a "team finished" or "blank" jersey. The jersey then has two possible paths to reach finished goods inventory. For some orders, the CM screen-prints the player name and number on the jersey to produce a "dressed" jersey, which is then shipped to the Reebok distribution center as a finished good. For blank jerseys Tony stated, "Blank jerseys are shipped directly to the (Reebok) distribution center with no player name or number. We keep these jerseys in inventory until we start to see demand, then we will burn blanks to meet customer orders on time."

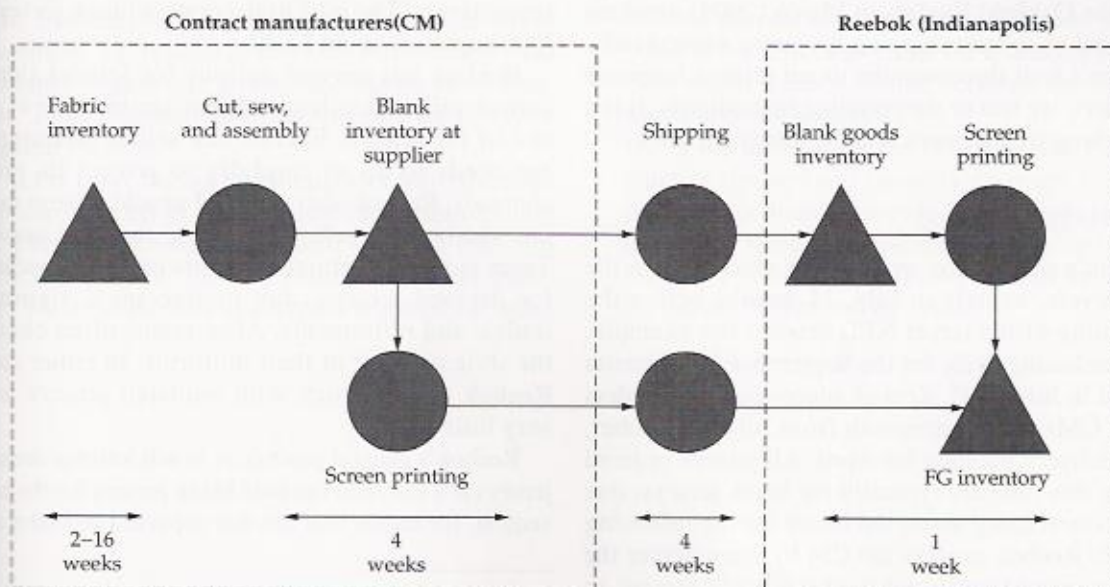


FIGURE 5-11 Reebok's supply chain—detail.

Within its DC, Reebok has its own screen printing facility, which it uses for finishing the blank jerseys. It has a capacity to print about 10,000 jerseys per day during the peak season. The finishing facilities in Indianapolis consist of many sewing and screen-printing machines, capable of embroidering and printing to the highest commercial standards. (This capacity is shared with other apparel items such as NBA jerseys, T-shirts, and sweatshirts. If the immediate requirements exceed the finishing capacity in Indianapolis, Reebok has identified good local outsourcing options with more than enough capacity, but at some additional cost. The cost to outsource is approximately 10 percent higher than the internal decorating cost.)

The inventory of blank jerseys in Indianapolis has two primary purposes: to fill demand for players that are ordered in small quantities and to respond quickly to higher-than-expected demand for popular players. The CM and Reebok have an agreed minimum order level of 1,728 units for the dressed jersey for any player. A player with demand less than this level will be supplied through the use of blank jerseys that are printed in Indianapolis. A typical NFL team has only a handful of players with demand sufficient to warrant production by the CM.

Reebok also uses blank jerseys during the off-season to meet immediate demand for players that unexpectedly change teams. Monty, production manager, cites a recent example, "When Warren Sapp signed with the Oakland Raiders in March (2004), retailers expected us to start shipping his jersey immediately. We can't wait three months to get jerseys from our suppliers; we had to start printing immediately. It is a good thing we had extra Raiders jerseys in stock."

PURCHASE PLANNING

Reebok's purchasing cycle starts much before the sales cycle, namely in July, 14 months before the beginning of the target NFL season. For example, the purchasing cycle for the September 2004 season started in July 2003. Reebok places purchase orders on its CMs twice per month from July to October, with delivery planned for April. All jerseys ordered during this time are typically for blank jerseys, due to the uncertainty about the roster for the following season. Reebok expects the CM to manufacture the jerseys immediately and hold the blank jerseys in inventory. If Reebok requires the jerseys in the

current year, then a request can be made to the CM to expedite those jerseys for immediate delivery.

During January and February, Reebok places orders against known demand, namely the advanced orders from the retailers. Reebok makes purchases during March and April based on a combination of known orders and forecasts. Reebok continues to place orders in May and June to position inventory at its DC in Indianapolis in anticipation of retailer orders for the coming season. From March to June is the most difficult time of year for Reebok's planners: the advance orders have been filled, but Reebok must decide its inventory based on its forecast of the demand for the upcoming season.

PLANNING PROBLEM

As noted above, the March to June time window is the most critical time in the purchase cycle. Reebok has already placed its orders to cover the preseason orders from the retailers, and now must place the majority of its orders based on its forecast for the upcoming season. In this section, we present an illustrative example, namely the planning problem for the New England Patriots for the 2003 season.¹⁰

Reebok sells jerseys to retailers at a wholesale price of \$24.00 per jersey. The retail price is in excess of \$50. Reebok's costs depend on the CM; the average costs for a blank jersey and for a dressed jersey, delivered to Indianapolis, are \$9.50 and \$10.90, respectively. The cost to decorate a blank jersey in Indianapolis is about \$2.40.

Reebok has several options for jerseys that it cannot sell to retailers and that are leftover at the end of the season. Reebok can sell to discounters but needs to do so carefully to protect its retail channels. Reebok also can hold unsold jerseys in its DC and hope to sell them during the next season. There is significant risk with this option, especially for dressed jerseys, due to free-agent signings, trades, and retirements. Also, teams often change the style or color of their uniforms. In either case, Reebok can be stuck with outdated jerseys with very little value.

Reebok's general practice is to sell leftover dressed jerseys at a discount but hold blank jerseys for the next season, for teams that are not expected to make any

¹⁰ These are not the actual cost, revenue, or volume numbers. All numbers have been disguised.

TABLE 5-4

DEMAND FORECASTS

Description	Mean	Standard deviation
New England Patriot Total	87,680	19,211
Brady, Tom, #12	30,763	13,843
Law, TY, #24	10,569	4,756
Brown, Troy, #80	8,159	3,671
Vinatieri, Adam, #04	7,270	4,362
Bruschi, Tedy, #54	5,526	3,316
Smith, Antowain, #32	2,118	1,271
Other players	23,275	10,474

changes to their jerseys. The average price that Reebok gets from a discounter for a dressed jersey is \$7.00. Reebok estimates its annual holding cost for a blank jersey to be 11 percent, which reflects both the capital cost for the inventory and the costs for storage and handling; thus, the cost to hold any unsold blank Patriots jerseys until next season is \$1.045 per jersey. The New England Patriots redesigned their uniforms a few years ago, and there is no indication that any changes are coming in the near future.

Forecasting demand is a challenge. Reebok develops forecasts based on a combination of factors: past sales, team and player performances, market intelligence, advanced orders, informed guesses. Furthermore, the forecast is continually revised as the sales cycle unfolds, and as Reebok gets more information on the current season.

In February 2003, following the initial order placement of retailers, enough information was available to generate a team and player level forecast. Table 5-4 provides this forecast for the New England Patriots.

At the time, the six named players were the most popular in terms of jersey sales; furthermore, these six players each had a demand forecast that was sufficient to cover the CM's minimum order quantity. Whereas Reebok did expect demand for other

players (e.g., Ted Johnson, #52), this demand was even harder to forecast and was not likely to exceed the CM's minimum order quantity. Hence, Reebok developed an aggregate forecast of more than 23,000 jerseys for all other players.

CASE DISCUSSION QUESTIONS

1. Given the uncertainty associated with player demand, how should Reebok approach inventory planning for NFL replica jerseys?
2. What should Reebok's goal be? Should Reebok minimize inventory at the end of the season? Or maximize profits? Can Reebok achieve both? What service level should Reebok provide to its customers?
3. Are the models in Section 2.2.2 helpful here? What is the cost of underage for a dressed jersey? What is the cost of overage for a dressed jersey? How might Reebok decide between dressed jerseys and blank jerseys?
4. Using the forecast for the New England Patriots, what is the optimal quantity to order for each player? For blank jerseys? What profit do you expect for Reebok? How much and what type of inventory is expected to be leftover at the end of the season? What service level?