

CASE STUDY

SUPPLY CHAIN CHALLENGES
AT LEAPFROG

Introduction

A supply chain consists of a network of companies linked together by physical, information, and monetary flows. When supply chain partners work together, they are able to accomplish things that an individual firm would find difficult, if not impossible, to do. Few cases illustrate this better than the situation faced by LeapFrog in August 2003.^{9,10}

LeapFrog, which describes itself as a “leading designer, developer and marketer of innovative, technology-based educational products and related proprietary content,”¹¹ had just introduced a new educational product called the LittleTouch LeapPad. The distinguishing feature of the LeapPad, whose target market was toddlers, was that it combined high-tech materials and sophisticated electronics to create an interactive “book” that made appropriate sounds when a child touched certain words or pictures.

By 2003, however, LeapFrog had developed a new approach that used sophisticated forecasting systems, fast information flows and cooperation between supply chain partners, and a flexible manufacturing base to improve the responsiveness of the toy supply chain. Here’s how it happened.

E-commerce, Relationship Management, and Forecasting

The first inkling that the LittleTouch LeapPad was a hit came in early August 2003, when major retailers such as Target and Toys “R” Us showed sales of 360 units during the introductory weekend. In previous years, these retailers might have hesitated to share such detailed sales information with a toy company. By 2003, however, retailers realized that sharing sales information in real-time with LeapFrog would increase the toy company’s odds of meeting surging market demand. The result was that by the Monday following the introductory weekend, LeapFrog knew about the weekend sales figures.

While 360 units might not seem like a lot, LeapFrog’s forecasting models indicated that if the trend continued, holiday demand for LeapPads would be approximately 700,000, more than double what LeapFrog had requested be produced by Capable Toys. LeapFrog and its manufacturing and logistics supply chain partners would have to find a way to produce another 350,000 LeapPads and move them to retail stores, all within a few months.

Supply Chain Constraints

Within days of developing the revamped demand forecast, LeapFrog started to work with Capable Toys to identify what steps would need to be taken to increase production levels. They found that several constraints had to be resolved:

- **Production molding constraints.** To manufacture the required plastic parts used in the LeapPad, Capable Toys had designed and built two sets of mold tools capable of producing the equivalent of 3,500 LeapPads each day. If these mold tools were run for 60 days, they could produce only $3,500 \times 60 = 210,000$ additional units—far short of the quantity needed.
- **Material constraints.** Capable Toys and LeapFrog faced a limited supply of key components, including custom-designed electronics and Tyvek, a special water- (i.e., drool-) proof paper.
- **Logistics constraints.** Even if Capable Toys was able to produce the additional toys required, LeapFrog had to consider how best to get those units from China to U.S. retail shelves. Traditionally, toys produced in China traveled by ship. Although this option was relatively slow, it kept costs down. But with production creeping into September and October, LeapFrog had to consider other, more expensive, options.

How did LeapFrog and its supply chain partners resolve these constraints? First, Capable Toys put its in-house engineers to work designing two additional mold sets. The third

While LeapFrog was confident the toy would be popular, no one—including the retailers, LeapFrog, and Capable Toys, the Chinese manufacturer who had primary responsibility for producing the LeapPads—knew for sure what actual consumer demand would be. Such uncertainty, which is typical for the toy industry, can be particularly problematic because the demand for toys is concentrated around the November and December holiday season, giving supply chain partners little time to react. Furthermore, toy companies planning for holiday sales have traditionally had to place orders many months in advance—in February or March—to allow enough time for products to work their way through the supply chain and to retailers’ shelves. In effect, toy companies had *one chance* to get it right. If a toy company ordered too few copies of a particular toy in February or March, customers in November and December went away disappointed, and the toy company lost significant revenues; if a toy company ordered too many, the result was leftover toys that had to be sold at a steep discount or loss.

mold set, which went online in October and improved on the design of the earlier two sets, allowed Capable Toys to increase its production of LeapPads from 3,500 to 6,300 units per day, an 80% increase.

At the same time, Capable Toys called on its first-tier suppliers to help identify additional sources for the specialized chips, membranes, and other electronics used in the LeapPads. Finding a source for the Tyvek paper was a little bit trickier; to gain access to this key material, LeapFrog had to contract with a U.S. company for the printing. While this added to the product’s costs, LeapFrog management felt this was a better alternative than running out of units and alienating retailers and their customers.

With the production capacity and material constraints resolved, LeapFrog had one final problem—getting the units to the stores in time for the holiday season. Because of the short lead time, LeapFrog was forced to use air shipping and special fast shipping, which added \$10 to \$15 to the cost of each LeapPad. These additional costs ate into the profit of the LeapPad, which sold for \$35, but as with the Tyvek paper, LeapFrog management felt that the long-term satisfaction of retailers and customers outweighed the additional costs.

In the end, the decisions LeapFrog made to respond to the surging demand for LeapPads turned out to be the right one. While LeapFrog has struggled financially in recent years, in 2010 the company made \$4.9 million on sales of \$432.6 million.¹² And the company has used its success with the LeapPad product line (discontinued in 2008) to launch a wider range of educational toys that incorporate even more sophisticated electronics.

Questions

1. Draw a map of the supply chain for LeapFrog, including the retailers, Capable Toys, and suppliers of key materials (i.e., Tyvek). Which supply chain partners are upstream of LeapFrog? Which are downstream? Which partners are first-tier suppliers? Second-tier suppliers?
2. What data ultimately led to LeapFrog’s decision to increase production levels of the LittleTouch LeapPads? Where did these data come from? How long after interpreting these data did LeapFrog start talking with Capable Toys about increasing production levels? Was it days, weeks, or months?
3. What part of the production process limited output levels at Capable Toys? How did Capable respond to the challenge?
4. What were some of the material sourcing challenges LeapFrog and Capable Toys faced? How did they resolve these problems?
5. What type of logistics solutions did LeapFrog use to get the toys to the stores on time? What are the strengths and weaknesses of these solutions? If it had been August rather than December, what other options might LeapFrog have used?

⁹LeapFrog Enterprises, Inc., 2010 Annual Report & 2011 Proxy Statement, http://media.corporate-ir.net/media_files/IROL/13/131670/2010AR/HTML2/leapfrog_enterprises-2011_0003.htm.