

Case study: The Rise of Wal-Mart

Wal-Mart demonstrates how a physical product retailer can create and leverage a data asset to achieve world-class supply chain efficiencies targeted primarily at driving down costs.

Wal-Mart isn't just the largest retailer in the world, over the past several years it has popped in and out of the top spot on the *Fortune* 500 list—meaning that the firm has had revenues greater than *any* firm in the United States. Wal-Mart is so big that in three months it sells more than a whole year's worth of sales at number two U.S. retailer, Home Depot.^[1]

At that size, it's clear that Wal-Mart's key source of competitive advantage is scale. But firms don't turn into giants overnight. Wal-Mart grew in large part by leveraging information systems to an extent never before seen in the retail industry. Technology tightly coordinates the Wal-Mart value chain from tip to tail, while these systems also deliver a mineable data asset that's unmatched in U.S. retail. To get a sense of the firm's overall efficiencies, at the end of the prior decade a McKinsey study found that Wal-Mart was responsible for some 12 percent of the productivity gains in the *entire* U.S. economy.^[2] The firm's capacity as a systems innovator is so respected that many senior Wal-Mart IT executives have been snatched up for top roles at Dell, HP, Amazon, and Microsoft. And lest one think that innovation is the province of only those located in the technology hubs of Silicon Valley, Boston, and Seattle, remember that Wal-Mart is headquartered in Bentonville, Arkansas.

A Data-Driven Value Chain

The Wal-Mart efficiency dance starts with a proprietary system called Retail Link, a system originally developed in 1991 and continually refined ever since. Each time an item is scanned by a Wal-Mart cash register, Retail Link not only records the sale, it also automatically triggers inventory reordering, scheduling, and delivery. This process keeps shelves stocked, while keeping inventories at a minimum. An AMR report ranked Wal-Mart as having the seventh best supply chain in the country (the only other retailer in the top twenty was Tesco, at number fifteen).^[3] The firm's annual inventory turnover ratio of 8.5 means that Wal-Mart sells the equivalent of its entire inventory roughly every six weeks (by comparison, Target's turnover ratio is 6.4, Sears' is 3.4, and the average for U.S. retail is less than 2).^[4]

Back-office scanners keep track of inventory as supplier shipments come in. Suppliers are rated based on timeliness of deliveries, and you've got to be quick to work with Wal-Mart. In order to avoid a tractor-trailer traffic jam in store parking lots, deliveries are choreographed to arrive at intervals less than ten minutes apart. When Levi's joined Wal-Mart, the firm had to guarantee it could replenish shelves every two days—no prior retailer had required a shorter than five day window from Levi's.^[5]

Wal-Mart has been a catalyst for technology adoption among its suppliers. The firm is currently leading an adoption effort that requires partners to leverage RFID technology to track and coordinate inventories. While the rollout has been slow, a recent P&G trial showed RFID boosted sales nearly 20 percent by ensuring that inventory was on shelves and located where it should be.^[6]

Data Mining Prowess

Wal-Mart also mines its mother lode of data to get its product mix right under all sorts of varying environmental conditions, protecting the firm from “a retailer’s twin nightmares: too much inventory, or not enough.”^[7] For example, the firm’s data mining efforts informed buyers that customers stock up on certain products in the days leading up to predicted hurricanes. Bumping up prestorm supplies of batteries and bottled water was a no brainer, but the firm also learned that Pop-Tarts sales spike seven fold before storms hit, and that beer is the top prestorm seller. This insight has led to truckloads full of six packs and toaster pastries streaming into gulf states whenever word of a big storm surfaces.^[8]

Data mining also helps the firm tighten operational forecasts, helping to predict things like how many cashiers are needed at a given store at various times of day throughout the year. Data drives the organization, with mined reports forming the basis of weekly sales meetings, as well as executive strategy sessions.

Sharing Data, Keeping Secrets

While Wal-Mart is demanding of its suppliers, it also shares data with them, too. Data can help firms become more efficient so that Wal-Mart can keep dropping prices, and data can help firms uncover patterns that help suppliers sell more. P&G’s Gillette unit, for example, claims to have mined Wal-Mart data to develop promotions that increased sales as much as 19 percent. More than seventeen thousand suppliers are given access to their products’ Wal-Mart performance across metrics that include daily sales, shipments, returns, purchase orders, invoices, claims and forecasts. And these suppliers collectively interrogate Wal-Mart data warehouses to the tune of twenty-one million queries a year.^[9]

While Wal-Mart shares sales data with relevant suppliers, the firm otherwise fiercely guards this asset. Many retailers pool their data by sharing it with information brokers like Information Resources and ACNielsen. This sharing allows smaller firms to pool their data to provide more comprehensive insight on market behavior. But Wal-Mart stopped sharing data with these agencies years ago. The firm’s scale is so big, the additional data provided by brokers wasn’t adding much value, and it no longer made sense to allow competitors access to what was happening in its own huge chunk of retail sales.

Other aspects of the firm’s technology remain under wraps, too. Wal-Mart custom builds large portions of its information systems to keep competitors off its trail. As for infrastructure secrets, the Wal-Mart Data Center in McDonald County, Missouri, was considered so off limits that the county assessor was required to sign a nondisclosure statement before being allowed on-site to estimate property value.^[10]

Challenges Abound

But despite success, challenges continue. While Wal-Mart grew dramatically throughout the 1990s, the firm’s U.S. business has largely matured. And as a mature business it faces a problem: Wal-Mart needs to find huge markets or dramatic cost savings in order to boost profits and continue to move its stock price higher.

The firm’s aggressiveness and sheer size also increasingly make Wal-Mart a target for criticism. Those low prices come at a price, and the firm has faced accusations of subpar

wages and remains a magnet for union activists. Others had identified poor labor conditions at some of the firm's contract manufacturers. Suppliers that compete for Wal-Mart's business are often faced with a catch-22. If they bypass Wal-Mart they miss out on the largest single chunk of world retail sales. But if they sell to Wal-Mart, the firm may demand prices so aggressively low that suppliers end up cannibalizing their own sales at other retailers. Still more criticism comes from local citizen groups that have accused Wal-Mart of ruining the market for mom-and-pop stores.^[11]

While some might see Wal-Mart as invincibly standing at the summit of world retail, it's important to note that other megaretailers have fallen from grace. In the 1920s and 1930s, the A&P grocery chain once controlled 80 percent of U.S. grocery sales, at its peak operating five times the number of stores that Wal-Mart has today. But market conditions changed, and the government stepped in to draft antipredatory pricing laws when it felt A&P's parent was too aggressive.

For all of Wal-Mart's data brilliance, historical data offers little insight on how to adapt to more radical changes in the retail landscape. The firm's data warehouse wasn't able to foretell the rise of Target and other up-market discounters. And yet another major battle is brewing, as Tesco methodically attempts to take its globally honed expertise to U.S. shores. Savvy managers recognize that data use is a vital tool, but not the only tool in management's strategic arsenal.

Key Takeaways

- Wal-Mart demonstrates how a physical product retailer can create and leverage a data asset to achieve world-class value chain efficiencies.
- Wal-Mart uses data mining in numerous ways, from demand forecasting to predicting the number of cashiers needed at a store at a particular time.
- To help suppliers become more efficient, and as a result lower prices, Wal-Mart shares data with them.
- Despite its success, Wal-Mart is a mature business that needs to find huge markets or dramatic cost savings in order to boost profits and continue to move its stock price higher. The firm's success also makes it a high impact target for criticism and activism. And the firm's data assets could not predict impactful industry trends such as the rise of Target and other upscale discounters.

Exercise:

Make a presentation addressing that:

- Summarizes the contents of this document
- Identifies data sources internal to the institution that can be used for data mining
- Identifies problems/business opportunities that could be fully or partially addressed using data mining techniques
- Proposes possible external data sources that may complement internal data sources
- Describes what kind of knowledge/patterns would be interesting to try to discover
- Proposes (as far as possible) data mining techniques that could be adequate to solve discover this type of knowledge/patterns

Note: this case study was extracted from the book Information Systems: A Manager's Guide to Harnessing Technology, by John M. Gallaugher, Ph.D. For more info see: <http://www.gallaugher.com/chapters>

References

^[1] From 2006 through 2009, Wal-Mart has appeared as either number one or number two in the *Fortune* 100 rankings.

^[2] C. Fishman, "The Wal-Mart You Don't Know," *Fast Company*, December 19, 2007.

^[3] T. Friscia, K. O'Marah, D. Hofman, and J. Souza, "The AMR Research Supply Chain Top 25 for 2009," *AMR Research*, May 28, 2009, <http://www.amrresearch.com/Content/View.aspx?compURI=tcm:7-43469>.

^[4] Twelve-month figures from midyear 2009, via *Forbes* and Reuters.

^[5] C. Fishman, "The Wal-Mart You Don't Know," *Fast Company*, December 19, 2007.

^[6] D. Joseph, "Supermarket Strategies: What's New at the Grocer," *BusinessWeek*, June 8, 2009.

^[7] C. Hays, "What Wal-Mart Knows about Customer Habits," *New York Times*, November 14, 2004.

^[8] C. Hays, "What Wal-Mart Knows about Customer Habits," *New York Times*, November 14, 2004.

^[9] K. Evans-Correia, "Dillman Replaced as Wal-Mart CIO," *SearchCIO*, April 6, 2006.

^[10] M. McCoy, "Wal-Mart's Data Center Remains Mystery," *Joplin Globe*, May 28, 2006.

^[11] C. Fishman, "The Wal-Mart You Don't Know," *Fast Company*, December 19, 2007.