

Zara: Doing it by the numbers

Math team fashions new model for retailer

By Donna Goodison | Sunday, October 14, 2007 | <http://www.bostonherald.com> | Business & Markets

Customers of Spanish fast-fashion retailer Zara can thank an MIT professor if finding the right outfit and size is now easier at its stores.

Sloan School of Management professor Jeremie Gallien and his colleagues developed a mathematical optimization model that the chain has incorporated into its software system to more efficiently replenish inventories at Zara's 1,000-plus stores in 68 countries.

Zara, which has quickly become an international retail phenomenon, is known for refreshing its stores with the latest fashions every two weeks.

The retail industry is experiencing something akin to the "rocket-science" revolution that shook up Wall Street 10 to 15 years ago, when trading firms started bringing in Ph.D.s, math scholars and software developers to implement sophisticated math models for trading and option pricing, according to Gallien, an associate professor of operations management

"Because of the volatile demand trends they face, large fashion retail companies were, until recently, driven more by a culture of human judgment, intuition and other 'left brain' activities," he said.



Photo by John Wilcox

A more systematic approach to inventory distribution is particularly important for Zara. Each item of its clothing is produced in limited quantities and has a very short life-cycle at its stores, which are refreshed with new merchandise every two weeks. Zara, which opened its first Massachusetts store at the Natick Collection last month, also has a policy of removing clothing items from displays whenever key sizes run out.

Under Zara's prior distribution system, store managers would receive weekly lists of items available to be shipped to their stores. Based on their store inventories, they would request quantities in the needed sizes. Warehouse employees would then manually adjust and input the requests for each store based on what was available at the warehouse.

But management felt that approach, which relied on the intuition and experience of employees without formal guidelines, wasn't one that would maximize sales for a company growing at a fast clip. The internationally popular Zara has been adding some 200 new stores a year, according to Gallien.

Store managers would frequently request quantities that exceeded their needs, knowing that they were rewarded for achieving certain sales levels. And the warehouse might not have enough of a given item to satisfy all stores.

Warehouse employees, meanwhile, were challenged by allocating so many clothing items in many sizes in a consistent way to each store. "Given the size of the team and the amount of the decisions that had to be made, they only had 1.6 seconds per person to make that decision," Gallien said. "It was a resource issue."

Now, those shipment decisions are recommended by the software tool developed by Gallien and his collaborators: UCLA Anderson School of Management professor Felipe Caro, Juan Correa and Jose Antonio Ramos, all Sloan grads.

While the new system considers input from store managers, it also uses historical store sales to build demand forecasts of what items are likely to appeal to each store's customers. Those forecasts, store inventories and the constraints of what's in the warehouse, are used to compute the optimal number of items and sizes that should be shipped to each store.

That frees warehouse employees to deal with decisions that warrant human experience and judgment. "They're able to focus their time on exceptions and the overriding of some decisions in cases where the model doesn't have relevant data," Gallien said.

Those situations might include how a national holiday in Thailand or a hurricane about to hit Mexico will affect store sales, or what to ship to a new store that lacks historical sales data.

Zara's sales - which last year hit \$7.6 billion - are expected to increase 3 to 4 percent as a result of the new software tool, which did not require significant cost to implement, Gallien said.

The new system also is expected to result in better shopping experiences for Zara customers, who should be more likely to find the types of items that they like in a given store and their sizes.

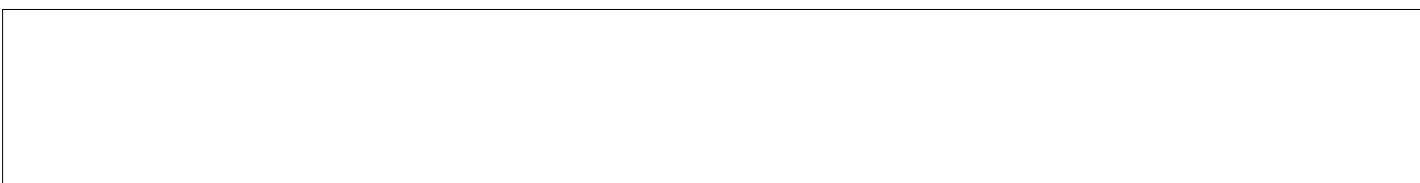
Zara's parent company, Inditex Group, is pleased enough with the new system that it's planning to use it at its other retail concepts, including the chain of more than 400 Massimo Dutti stores.

Gallien and Caro also are working on a second project for Zara. They're developing similar mathematical optimization models to improve pricing decisions during Zara's bi-annual clearance sales.

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