

The Hidden Costs of Clicks

by Tim Laseter, Elliot Rabinovich, and Angela Huang

02/28/06

a strategy+business exclusive

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Internet retailers are finally learning why books and luggage make money online — while shoes and toys don't.

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EBags.com ranks as one of the more notable successes among Internet retailers. The leading online purveyor of luggage, eBags generates more than \$38 million in revenue a year and has been consistently profitable since its founding in 1998, in the heyday of the Internet bubble. Operating with minimal inventory thanks to direct “drop shipments” from manufacturers to end customers, eBags could be the model for the future of commerce.

But that model is still developing. EBags continues to expand and adapt its business. In 2004, the online retailer, which is based in Greenwood Village, Colo., acquired Shoedini.com, a seller of dress shoes for men and women, and renamed it 6pm.com. Having expanded from its original focus on luggage into backpacks, handbags, and other accessories, eBags considered shoes the next logical category for marketing synergies. Yet, despite the clear marketing logic, selling shoes online turned out to be more complicated than selling the other product lines.

The issue, as eBags discovered

and as many online vendors have yet to understand, highlights the fundamental operational challenges of Internet retailing. It centers on a concept common in the business-to-business realm but rarely employed in a business-to-consumer context: cost-to-serve. Defined as the total supply chain cost from origin to destination, cost-to-serve incorporates such factors as inventory stocking, packaging, shipping, and returns processing. This metric also helps to explain why some of the early high-flying “e-tailers,” such as eToys and Webvan, failed miserably.

In the eBags example, the cost of serving shoe customers is far higher than the cost of serving luggage customers. The Shoedini acquisition more than doubled the number of SKUs that eBags handled, and the complexity of managing the inventory exploded. Most bags come in two variations — usually different colors. But a shoe style comes in several colors and many sizes; there can be 30 or more variations of a single model.

Bags, furthermore, come in boxes that manufacturers use for shipping via small-package delivery



to a fragmented base of mostly mom-and-pop retail customers. But shoes ship to retailers in bulk packaging rather than in individual boxes. When 6pm.com sells a pair of dress loafers direct to a consumer, the manufacturer thus has to incur extra shipping and handling costs to repack and ship the shoes.

Most important, shoes have a short product life cycle — typically three to six months — and suffer from a high return rate. (Some customers order two pairs at a time, planning to return the pair that doesn't fit.) Luggage life cycles can last six years, and return rates are minimal. For eBags, this means that although shoes and luggage command similar gross margins, shoes carry a much higher cost-to-serve, and selling them online thus requires a different business model.

Understanding the cost-to-serve dynamics is more important than ever as online retailing continues its growth spurt. More than a third of U.S. households now shop online, according to a September 2005 report from Forrester Research, and annual sales of physical goods are expected to hit \$100 billion for the year.

Over the second decade of online retailing, the companies that truly grasp the drivers of cost-to-serve at the level of individual items and individual customers will unlock the full value-creating potential of online retailing as an alternative to — and complement of — traditional retailing.

Trial and Error

Back at the dawn of online retailing, highfliers like Value America (an online “department store”) and Webvan (an Internet-based delivery service that focused its offerings on

grocery items) did not comprehend the operational cost implications of their business models. Value America started with a virtual inventory model supposedly applicable to any branded product. Although its initial offering, computer hardware, sold well, shipping and handling costs for lower-value goods proved prohibitive, and an unmanageable flood of returns ultimately sank the company in August 2000. Less than a year later, in July 2001, Webvan declared bankruptcy after concluding that it would never turn a profit, despite its state-of-the-art supply chain with a hub-and-spoke network of delivery cross-docks and highly automated distribution centers. (The flaws in its economic model were highlighted in a Booz Allen Hamilton study more than a year before its collapse. See “The Last Mile to Nowhere: Flaws & Fallacies in Internet Home-Delivery Schemes,” by Tim Laseter, Pat Houston, Anne Chung, Silas Byrne, Martha Turner, and Anand Devendran, *s+b*, Third Quarter 2000.)

Even Amazon.com did not fully appreciate all the factors driving its cost-to-serve. When Jeff Bezos opened his Internet store in 1995, he started with books, reasoning that it would be easier to offer the millions of titles in print online than through a traditional mail-order catalog. Although Mr. Bezos may not have fully grasped all of the inefficiencies inherent in the book industry, he saw that his model could minimize inventory risk — a significant problem in book retailing. Unlike other manufacturers, publishers take back all unsold copies of their product. Up to 30 percent of trade books ship back to the publisher at enormous cost to

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everyone: to the publisher, who refunds the payment to the retailer; to the retailer, who pays for shipping and restocking; and indirectly to the consumer. Amazon's online model minimizes the inherent inefficiency of placing potentially unsellable titles on thousands of retail bookshelves by relying instead on a relatively small inventory to support a "virtual bookshelf." If Amazon returns fewer books than a bricks-and-mortar retailer, it should be able to negotiate lower prices from the publishers (reflecting its lower

goods. Without any toy merchandising expertise, Amazon guessed wrong for the 1999 holiday season and wrote off \$39 million in excess toy inventory in early 2000, having sold only \$95 million worth of toys.

Furthermore, conventional toy retailers enjoy advantages that traditional booksellers don't. Unlike Barnes & Noble, Wal-Mart and Toys "R" Us ship multiple truckloads of goods to each store weekly, which puts their transportation costs far below the cost of shipping individual toys to consumers. Rec-

available), 44 percent of retail sales of computer hardware and software took place via the Internet. Certainly tech-savvy computer buyers are more likely than the general population to shop online. But equally important, the high value-to-weight ratio of computers — especially as laptops become more popular — minimizes the importance of transportation cost and makes the category a low-cost-to-serve option over the Internet.

Cost-to-serve factors like inventory, packaging, shipping, and returns help explain why online sales of books outstrip online sales of other kinds of merchandise. E-commerce accounts for nearly 13 percent of the total bookstore and newsstand sales in the United States — \$15 billion in 2002 (the latest year available from the U.S. Census Bureau) — and the same portion of the \$21 billion market for office equipment and supplies. By contrast, the Internet accounted for just 2.7 percent of the \$92 billion in U.S. sales of furniture and home furnishings. Or consider the largest retail category, food and beverages. Online sales accounted for only two-tenths of 1 percent of the \$450 billion U.S. food and beverage retail sales total in 2002. As Webvan (and many investors) learned, targeting a huge market does not guarantee success if the cost-to-serve economics don't work.

Future growth in e-commerce will likely come from continued modification of existing supply chains rather than wholesale replacement. For example, despite the generally low level of Internet sales in furniture and housewares, Williams-Sonoma has achieved great success online. The company, which operates a mix of retail, cata-

For each combination of customer and merchandise, there is an optimal cost-to-serve strategy.

cost-to-serve as a customer of the publisher). Amazon can then pass along those savings through lower prices to the consumer.

Although books worked for Amazon, toys were a different matter. As Jeff Bezos learned, the toy supply chain comes with a much higher cost-to-serve. Toys are more seasonal than books and demand for them is far less predictable. Magnifying those challenges, most toys are made in Asia, and the replenishment cycle can easily outlast the actual selling season. That means merchandisers must accurately predict which toys will be hits and then buy enough inventory for the whole season; Amazon therefore gained no benefit from its "virtual shelves." Guessing too conservatively results in missed sales, and guessing too optimistically leads to write-offs because toy manufacturers do not typically accept returns of unsold

ognizing these differences, Amazon gladly partnered with Toys "R" Us in 2000, shifting the inventory risk to the experts but leveraging the additional product lines to lower its own shipping cost for multi-item orders.

Nonetheless, the two partners had a falling-out in 2004, with dueling lawsuits in the New Jersey court system. This denouement suggests that the cost-to-serve for online toy retailing produced a financial model that would not support the two parties' aspirations adequately.

Channels and Brands

Although successful online retailing depends on a variety of factors, the cost-to-serve of a particular product category can explain much of the variance in the penetration rates of Internet sales. For example, according to the United States Census Bureau, in 2002 (the latest data

log, and Internet channels under its eponymous store brand as well as the Pottery Barn and Hold Everything brands (among others), sold \$3.1 billion in fiscal 2005 — 52 percent through its traditional retail stores and 48 percent through its two direct-to-consumer channels. At \$3.3 million in annual sales for its average kitchenware store, Williams-Sonoma doesn't gain any significant transportation economies in shipping to its stores rather than directly to its customers. Ultimately, the company can maximize profits by assigning items to channels and brands to reach consumers at the lowest cost-to-serve.

Circuit City's Opportunity

Rather than minimizing the cost-to-serve across channels, traditional retailers often put their most popular items on their Web site. Although such an approach sounds logical, the reverse would typically work better. Traditional store-based retailing requires turning inventory quickly to justify expensive floor space. Slow-moving inventory — especially products with a high risk of obsolescence — can benefit from the centralized inventory pooling of online retailing. And if the product commands a high value-to-weight ratio, the cost penalty from direct-to-consumer shipping is minimal.

Circuit City, the “big box” consumer electronics and small appliances retailer, has an opportunity to minimize its cost-to-serve by making smart use of its many service options: in-store shopping, in-store or online ordering with delivery from the store, online ordering with store pickup, and online ordering with direct home delivery. Consumer electronics is a category currently underexploited by e-com-

merce. In 2002, only 2.5 percent of electronics and appliances sales went through online channels despite the fact that many electronic goods share the high value-to-weight ratio of computer hardware and software. Finding the optimal cost-to-serve for each product and customer category would give Circuit City a competitive advantage over pure-play online retailers or less aggressive traditional competitors.

Circuit City operates a network of nine regional distribution centers to serve its 621 domestic stores. With average weekly sales of more than \$300,000 per store, Circuit City generates overall cost savings from its transportation network scale. But the relative importance of this bulk shipping network varies by product.

Consider the Hitachi 65" HDTV Display recently offered at \$1,299. It weighs 324 pounds and measures 5-foot-by-5-foot with a 28-inch depth. Shipment of such a bulky item through the company's full-truckload distribution network offers significant savings over a small-package shipment directly to a consumer's home via UPS. But, with relatively low unit sales and a short product life cycle, inventory held at the store represents a high cost and big risk. Circuit City might benefit from keeping a minimum inventory of this item at the store — even just a display model — and having customers order it online for in-store pickup after the next delivery from the regional distribution network.

A pure online offering might work best for the Sony HDV camcorder. Priced at around \$1,999, it is the most expensive model among the 60-plus camcorders that Circuit City sells, and it costs three to five

times the price of the most popular models. As with the Hitachi HDTV, low unit sales of the Sony HDV camcorder may not justify stocking the item at the store because of the high inventory-carrying cost and risk of obsolescence. But unlike the Hitachi HDTV, the camcorder weighs very little — less than two pounds — and, accordingly, Circuit City's distribution network provides little transportation cost savings. Rather than stocking it at each of the nine regional distribution centers, Circuit City could gain further savings by pooling the inventory in a single national distribution center and shipping directly to customers' homes, minimizing the cost-to-serve for Circuit City as well as for the customer.

For each combination of customer and merchandise, there is an optimal cost-to-serve option among the different delivery choices: store inventory, store delivery, in-store pickup, and direct delivery. For customers living far from a store, for example, even for bulky products like the HDTV, the benefits of routing the goods through a regional distribution center (such as that maintained by Circuit City) may be offset by the extra costs of a two-step distribution cycle, compared to the simplicity of direct home delivery. Finding the optimal cost-to-serve at the levels of customer and item may be challenging, but it will be rewarding.

Even pure-play online retailers should consider the cost-to-serve in their pricing. Despite having the ability to customize Web pages to each individual, few companies fully leverage the potential to price products to reflect the different underlying costs. For example, eBags offers special pricing for bulk pur-

chases for corporate sales, but it does not attempt to adjust shipping costs on the basis of a customer's geographic location. Such fine-tuned pricing could potentially increase the company's profitability. That's the kind of detail that retailers will have to consider as they grow their online businesses.

Accounting for Intangibles

Cost-to-serve in online retailing includes such factors as the expenses associated with inventory, transportation, and replication of the

failed Web retailers, focused on the "consumer experience" by investing in technology to allow shoppers to visualize the furniture in virtual mockups of their home. These companies' supply chains — which, like Amazon's, depended on outside delivery services — proved untenable. The challenge of scheduling precisely timed home deliveries, something Amazon's products typically do not demand, proved to be beyond the ability of these nascent furniture retailers. Moreover, products often arrived damaged or unac-

model, and the retailer would then locate the desired inventory at another store or at a centralized stock pool with delivery in days, not weeks. Such a business model would leverage the Internet's information-sharing power to lower the "cost" of long lead times without incurring an undue level of inventory investment.

In the end, future success for retailers of furniture, electronics, luggage — any sort of retailers — won't be a matter of expanding standard offerings to the burgeoning Internet channel or replicating existing online models. Despite the obvious marketing synergies, toys present different challenges from books, and shoes different challenges from luggage. Smart retailers will take a closer look at the costs of bringing each item to each consumer — the cost-to-serve — to decide how to merchandise their offerings and ultimately grow their business by applying the right retail model at the right time. +

Reprint No. 06103

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existing offerings of traditional retailers. But to get a truer sense of cost-to-serve, it should also take into account intangible costs to the customer. Consider the current approach to furniture retailing, one of the least customer-friendly supply chains in retailing.

Because there are so many manufacturers offering so many styles in so many woods, finishes, and fabrics, most furniture retailers display a limited selection of goods. Customers place their orders and then wait for the couch, table, or chair to be manufactured, shipped to the retailer, and finally delivered to their homes. The whole process regularly takes 12 or more weeks — a cost in "pain and suffering" that falls squarely on the customers.

Early attempts to improve on the furniture retailing process via the Internet proved daunting. Living.com and Furniture.com, two

acceptable for some other reason, resulting in return rates of up to 35 percent of sales. Despite good efforts, the "virtual" model failed in the furniture category.

The Amazon online model doesn't work for furniture sellers. It would be better for them to emulate the automotive industry. The big opportunity online for furniture retailers may lie not in eliminating storefronts, but in dramatically reducing the lead times in the order-to-delivery cycle. Car dealers resolve the choice challenge by sharing inventory information among dealerships and exchanging vehicles to better meet a particular customer's desires. Roughly half of the vehicles sold by a typical dealership come from such an exchange; the other half come from the dealer's own inventory on the lot. Similarly, with furniture, customers could check the "look and feel" of a display

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is published by Booz Allen Hamilton.
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