AMAZON Your Industry: Extracting Value From the Value Chain

More than $2 billion in additional value lies locked inside the trade-book publishing supply network. The lessons for unleashing it apply to all.

By Timothy M. Laseter, Patrick W. Houston, Joshua L. Wright and Juliana Y. Park

"Way cool" Web sites and measures of "hits" and "eyeballs" are clearly driving revenue in the dot-com world. To date, these metrics have provided the basis for the extraordinary market valuation of the new generation of Web retailers. In the near term, most "e-tailers" must focus on surviving the incubator phase of the Internet retail industry by gaining enough market share to become a sustainable player. "Efficiency and productivity lie in our future," Amazon.com Inc.'s president, Joe Galli, has said.

Eventually, however, the basis of competition will change. In the long term, we believe that sustainable competitive advantage in the Internet Economy will result from fundamentally transforming the entire value chain — in other words, managing the physical supply web, not just the virtual computer web.

To understand how the Internet can transform an industry value chain, we explored Amazon.com's original business of book-selling and the entire supply network of

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the publishing industry. After reviewing the players in the publishing industry value chain — authors, publishers, printers, wholesalers and retailers — we analyzed industry economics: What drives profits for each player? Surprisingly, the answer is supply-chain costs — much of which represent waste in the traditional model. For example, consider the 30-plus percent return rate for adult hardcover books through traditional channels, versus the 3 percent return rate through Amazon.com.

Although many have examined Amazon.com — the icon of the Digital Age — our analysis goes beyond Amazon.com to identify a number of Internet axioms worth consideration by dot-com startups and traditional retailers alike:

- Inefficient supply networks are at risk from new players.
- First-movers gain advantage from scale.
- New delivery systems require big investments.
- Defining a new distribution structure is strategically vital.
- Companies should use customer knowledge for pull marketing.

The publishing industry story shows how almost any company can begin to Amazon its own industry.

PUBLISHING INDUSTRY OVERVIEW

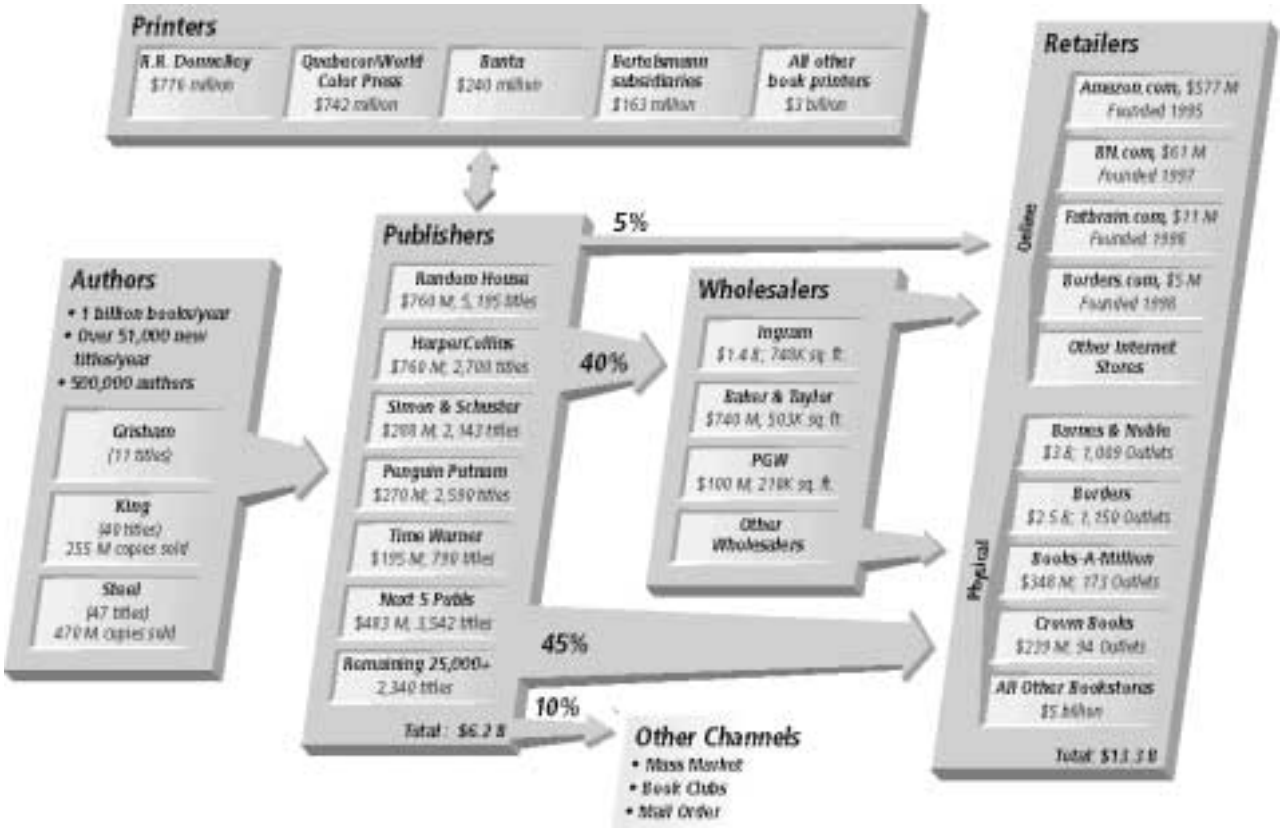
Along every step of the value chain, the $23 billion publishing industry consists of a complex collection of players. To simplify the picture, let's focus on the books

you buy from your neighborhood bookstore — or, increasingly, over the Web. This subset, commonly referred to as the "trade" segment, includes hardcover books and higher quality trade paperbacks. (This excludes the cheaper paperbacks primarily sold by mass merchandisers like grocery and discount stores.)

Americans bought over one billion trade books in 1998. Though roughly half of these books consisted of backlist titles (those published in previous years), the other half — 500 million books — were of the 51,000 new titles released that same year. Consider that the average new title sold fewer than 10,000 copies, while John Grisham's 1998 release, "The Street Lawyer," sold 87,000 copies in its first week in stores. You can imagine the difficulty in describing a "typical" author; while tens of thousands of people can claim the title "author" each year, only a handful make it big. Danielle Steel, for example, has racked up sales of over 400 million copies of her 47 novels, while Stephen King's 40 books have sold over 225 million copies. Despite these enormous numbers, the top 10 best-selling authors still account for only a small percentage of total sales. At Barnes & Noble Inc.'s stores, for example, best sellers represent only 3 percent of store sales.

There are over 25,000 publishers in the trade-book supply web. These publishers seek out new authors and new ideas — constantly searching for the next best seller. Again, we find a disparity in extremes. With only 51,000 new titles a year, the average publisher releases about two new books per year. But the largest publisher in the United States, Random House Inc., released 2,500 new trade ti-

EXHIBIT I
A WHO'S WHO IN PUBLISHING'S SUPPLY CHAIN

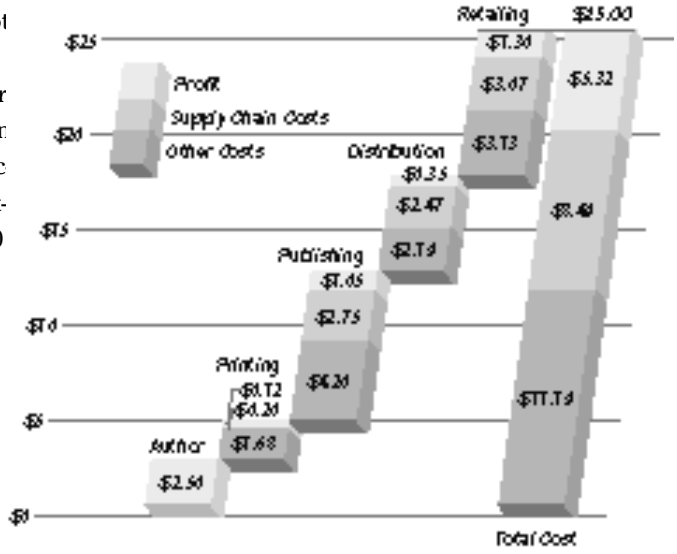


Source: Simba Information Inc. Trade Book Publishing 1999, Standard and Poor's Publishing Industry Surveys, company annual reports and BAH analysis

tles in 1998. The top-10 publishers accounted for 20 percent of the new titles. Since half of each year's sales come from backlists, the largest publishers maintain a tot library that can exceed 30,000 titles.

The $5 billion United States book-printing industr has a similar structure: Though the total industry cor tains thousands of printers, the top-five companies ac count for 40 percent of the market. Trade-book printing represents a surprisingly small portion of the $210 billion printing industry. Even for R.R. Donnelley & Sons Company, the largest independent trade-book printer in the United States, trade books account for a mere 15 percent of total revenues. Commercial printing of catalogues, retail inserts, business forms, advertising coupons, instruction manuals, annual reports and marketing brochures provide the bulk of the sales. In fact, if you add up all of the commercial printing done for the General Motors Corporation, the annual total would exceed the print spending for 99 percent of the book publishers in America. From that perspective, trade-book printing looks rather minor.

EXHIBIT II
WHO GETS WHAT FROM A $25 BOOK



Source: Simba Information Inc. Trade Book Publishing 1999, Standard and Poor's Publishing Industry Surveys, Brill's Content Magazine, October 1998, and BAH analysis

For some in the publishing industry, wholesalers provide the next link of the chain. Though most large retailers maintain an integrated distribution network, independent booksellers depend on large wholesalers. Wholesalers buy in bulk from publishers and then ship smaller quantities to independent booksellers and sometimes to chain stores. Publishers ship about 40 percent of their volume to wholesalers versus about 45 percent direct to bookstores. The Ingram Book Group, the largest American wholesaler, processes 115 million books through 11 fulfillment centers each year, to serve 32,000 retail outlets — accounting for about one-third of the total units shipped through wholesalers.

Bookstores both large and small provide the final link in the chain from authors to the 270 million American consumers. But small independent bookstores have been pounded by two waves of change over the past decade, reducing their numbers from 6,500 in 1991 to 3,500 in 1998. First, the major chains introduced the category-killer superstores with up to 60,000 square feet of retail space and 175,000 titles in stock. With the addition of coffee shops, they changed book-buying from a traditional retail activity to something akin to an intellectual social outing. In July 1995, Amazon.com launched the second wave, by allowing consumers to browse 4.5 million titles from the comfort of their own computers. Today, Amazon.com, plus the two largest bookstore chains, Barnes & Noble and Borders Inc., account for 45 percent of total trade sales.

Exhibit I summarizes the industry overview described above. The model suggests a simple flow of the one billion trade books from the authors on the left to the retailers on the right, but it misses one key detail required to truly understand the complexity of this fascinating industry. The missing fact exists as a relic from the Great Depression, and establishes the publisher as the linchpin in the value chain: Publishers guarantee the sale of every book printed. In most cases, wholesalers and retailers can simply return any unsold book to the publisher for full credit — paying only a transportation and handling fee. In 1998, returns for adult trade hardcover books ran 32 percent and softcover returns ran 27 percent.

Despite the magnitude of the return rate, a recent report on the trade-book publishing industry by Simba Information Inc. noted that "the returns crisis became

merely the returns problem" because returns were down in all but one trade category. Yet we maintain that the returns problem serves as a catalyst for the transformation of the publishing industry.

PUBLISHING ECONOMICS

Imagine purchasing an average $25 hardcover book from a Barnes & Noble store. How much does each member of the publishing supply network take, and what drives the economics of each? (See Exhibit II.)

On average, an author receives a 10-to-15 percent royalty based on retail revenues from the book. Publishers generally pay an advance once the author completes the manuscript, which occurs well before the book's release date. Assuming our average book sells 10,000 copies at full retail prices, the author would earn $25,000 to $37,500 per book — about the value of the typical advance. Given these slender margins, few authors ever see a true royalty check. But a book that makes the New York Times best-seller list may sell several hundred thousand copies. Suddenly, the $2.50 to $3.75 per copy starts adding up for the author. For a well-known author, like John Grisham, the royalties and advances can be enormous. Mr. Grisham receives advance payments of $3 million to $5 million, because his books are virtually guaranteed to sell several million copies. Sales volume clearly drives profits for an author.

Publishers bear substantial fixed costs: a slew of editors must review each book, whether it sells 10,000 or one million copies. The costs of a publisher's sales force, distribution centers, corporate staff and marketing budgets (which are sometimes huge) typically run around $5.50 per book. As a result, on average the publisher makes less profit than the author — typically between $1.75 and $3.00 per book. A single unexpected hit, however, can cover up for a lot of misses. For example, "Tuesdays With Morrie" by Mitch Ablom provided big profits for Random House in 1998 and 1999. A grass-roots groundswell emerged for this lesser-known author, keeping it on the New York Times best-seller list for 107 weeks. Scale allows a publisher to create a portfolio of titles to hedge its bets and cover fixed costs — with a few hits ultimately driving profitability.

Printing operates with simpler economics. The manufacturing cost of the average hardcover totals about $1.50 to $2.00 per book, and the typical printer makes a net profit of only 2-to-3 percent — literally pennies per book. Despite these relatively small numbers, the economics of printing have a big effect on the publishing industry as a whole. Printers use gigantic presses capable of printing 10,000 copies of a 250-page book in a mere two hours — once the press reaches full-speed output. But because it can take up to an hour to change the book on press and return it to full production, the economics of printing favor large press runs that minimize the lost time from changeovers. Printer pricing reflects this batch economics and encourages the publisher to buy in larger batches — lowering the variable cost per book and theoretically improving the profit margin.

Distribution, physically moving the book from printer to retail outlet, typically involves a wholesaler, but can be managed directly by the publisher and retailer. The process works like this: A wholesaler buys books in bulk from a publisher — preferably in a full truckload to minimize shipping costs. At the fulfillment center, the wholesaler breaks down the bulk purchases and combines titles from many different publishers for shipment to retailers in the largest batch possible in order to further minimize transportation costs. In total, the distribution process accounts for about $2.75 per book and yields a 2 percent profit margin for the wholesaler. (Large retailers like Barnes & Noble maintain in-house distribution operations and can potentially achieve slightly lower distribution costs.)

The retailer has the potential to take the largest slice from the book-sales dollar because it typically pays the publisher only 50 percent of the suggested retail price. Retailers' costs — store space, sales clerks and inventory — quickly eat into this margin, however, and because most trade books sell at a discount, the bookseller typically makes only about $1.50 per book. Bookstores, like most retailers, monitor their economics using revenue per square foot of retail space as a measure. Driving up that metric in a traditional retail outlet requires a lot of customer traffic and the right product selection.

Titles that don't sell take up valuable space — but not for long, considering the astounding number of books returned to publishers in 1998. And 1998 was a good year,

with lower returns than normal.

INDUSTRY TRANSFORMATION

Online book retailing turns the traditional model on its head: With virtual shelf space replacing physical retail space, sales per square foot becomes a mathematical infinity. Just as critically, online retailing eliminates the need for buyers to forecast consumer interests and select books for shelf display. Instead, virtual bookshelves put every book on display and allow true demand to drive the supply network. As a result, Amazon.com returns only about 3 percent of its orders — around one-tenth of the traditional return rate.

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Online book retailing is the first step in the transformation of the publishing industry. A tenfold reduction in return rates will eliminate 90 percent of the $100 million spent industry-wide on shipping and handling returned books. But that captures only the incremental cost of processing returns, and excludes a book's original printing and distribution costs. A truly efficient supply network, which processed only saleable books, could save over $2 billion — quite an opportunity given that industry profits from the one billion trade books total about $4 billion today.

The publishing industry is poised to respond to this transformation with technological advances ranging from more efficient methods of distributing traditional books to electronic books (e-books) and other methods of delivering content. Surprisingly, among the most important factors behind these advances is the industry's recent consolidations, which encourage greater efficiency and economies of scale.

In the past few years, publishers have consummated numerous mergers and acquisitions. In 1998, the German media conglomerate Bertelsmann A.G. acquired the largest publisher in the United States, Random House, and merged it with Bertelsmann's Bantam Doubleday Dell Publishing Group unit to create the world's largest English-language publisher, with estimated revenue over $2 billion. Pearson P.L.C., another European firm, recently acquired the Putnam Berkley Group Inc. for $336 million to create Penguin Putnam Inc. Not to be outdone, News Corporation entered the consolidation fray by merging its HarperCollins Publishers unit with the Hearst Book Group, a $180 million acquisition that made HarperCollins the largest publisher after Random House, and pushed Pearson down to third. These three publishing giants together now account for 31 percent of the trade-book market.

Merger activity for printers is also on the rise. Quebecor Printing Inc. recently acquired World Color Press Inc. for $1.4 billion in cash and stock plus the assumption of $1.3 billion of World Color's debt, creating the largest book printer in North America, with approximately $800 million in sales. Both R.R. Donnelley and the Banta Corporation also announced plans for new acquisitions as part of their growth strategies.

These combinations all share a common objective: to build economies of scale in anticipation of a technology-driven transformation of the industry. The bigger players can better leverage new technologies — and gain the scale to resist threats to their positions.

PUBLISHING'S TECHNOLOGICAL INNOVATIONS

The electronic book offers the ultimate opportunity to transform the publishing supply web by eliminating many steps of the traditional model. But a number of obstacles hinder the development of this technology. First, publishers worry about piracy of their content; with access to a digital version of the book, a pirate could distribute thousands of copies without the publisher or author accruing any revenue. Given the extremely high fixed cost of creating an e-book's content, many publishers are

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FOCUS: DELL'S SUPPLY DEMANDS

by Victoria Griffith

One summer day in 1998, engineers at SCI Systems Inc., a Huntsville, Ala. circuit board manufacturer, logged onto the Internet and saw that the Dell Computer Corporation, the Austin, Tex. PC manufacturer and SCI's biggest customer, was selling a certain type of motherboard faster than others. Without receiving a single telephone call or paper from Dell, SCI swiftly switched two assembly lines over to the higher-demand model.

"We didn't have to wait for a firm order to come in," says SCI component engineer Ralph Grahek. "We could see where the demand was going to be and filled it."

In a bid to streamline production, companies are pushing information up the value chain — the production sequence that creates and delivers something of worth to the consumer. If suppliers make too little of a certain part, or if it's stored in the wrong plant, companies will be unable to meet customers' orders on a timely basis. If suppliers make too much, they will incur inventory costs that will eventually be passed on to their corporate customers. Information sharing, it is hoped, will insure the availability of components and raw materials at the right price, at the right place and at the right time.

The business world is hurtling toward the day when customer purchases at the end of the value chain will be acknowledged at the start of the chain within hours, or even minutes. The purchase of an espresso by a tourist in Italy, for example, will trigger a sequence of signals that will ultimately be seen on the PC of a coffee farmer in Colombia.

Some of the world's largest manufacturers are leading the way. Detroit's Big Three automakers had been using private electronic networks to pass data to important suppliers even before the invention of the Web. Yet the Internet makes such information-sharing affordable for almost any enterprise. Accordingly, in November 1999, the Ford Motor Corporation and the General Motors Corporation said they would form Internet exchanges to extend demand information to suppliers. Perfecting information flow becomes even more vital as companies move to customized production. G.M. and Ford are looking to follow the Toyota Motor Corporation's lead by allowing consumers to select exactly the options they want — a blue model with a sunroof and all-wheel drive, for instance — and provide precisely that car within 15 days. To do that, they need to pass information on to their suppliers.

"Unless the electronic curtain is pulled back to include suppliers, this sort of tailored manufacturing can't work," says Anand Sharma, C.E.O. of TBM Consulting Group, a Durham, N.C. consulting company.

Dell Computer's inventory controls provide an example of how Internet supplier exchanges function. Even before the Internet took off, Dell was building its success on inventory reduction. The results have been tremendous: Dell has lowered its average inventory holdings from 35 days in 1993 to six days today. The company says it has been able to garner substantial profits from selling low-priced computers because of those savings.

A key element of this model is Dell's "hubs" — special storage facilities near its factories. The computer maker forces its suppli-

ers to leave materials in these hubs; Dell pays for the goods as it uses them, and expects the bins to be constantly replenished by suppliers.

All this has been accomplished at a price to the company's suppliers. Because their parts are sitting at a Dell site, suppliers can't sell them off to competitors like Hewlett-Packard or Compaq. While Dell foots the bill for storage, suppliers must put up with longer intervals between the time they make a piece and the time they sell it. This, traditionally, is the main cost of carrying inventory. "It's been easy for the suppliers to feel like victims," says John Fontanella, director of supply-chain research at AMR Research Inc. in Boston, Mass. "It costs them money, and they're always being battered on margins."

Dell's new system, which has been in place for nearly a year, uses the Internet for information exchange. A special site on the Web allows managers at each of SCI's four plants to "see" the bins at a Dell hub. Workers at Dell update the site hourly with the latest inventory information. SCI's employees can then decide when to speed up or slow down production.

"Before, we had no real-time idea of consumption," says SCI's Grahek. "Every now and then we got a phone call saying 'Hey, we need more!' or 'Hey, we've got tons of those!' A few times, we came very close to running out, down to just one day's supply, and had the added cost of air-shipping boards."

The Web site doesn't give SCI, one of Dell's largest suppliers, complete control. Dell may decide, for instance, to buy from an SCI competitor, leaving the inventory with the supplier. Yet the Web site also provides SCI with information on the likelihood of such a switch by allowing the supplier to compare average product price and quality data with that of its competitors. If SCI is providing a good quality product at a good price, the company can rest assured it will probably continue to get orders.

The system is working so well that SCI says it is setting up a similar site for its own suppliers. "That will take far longer, though," says Grahek. "It's like a pyramid. Dell has dozens of suppliers, but we've got hundreds."

How far can companies take the concept? Michael Dell, Dell Computer's chairman and C.E.O., says the new system will help his corporation bring inventories so low that it will measure availability in hours rather than days. Fine-tuning product flow to that level of precision, however, will probably be difficult. Even if the flow of information becomes seamless, the physical world will eventually impose its limits. Weather and traffic, for example, can still delay deliveries, which can throw entire production lines off kilter. There are some things the Internet, as powerful as it is, cannot resolve.

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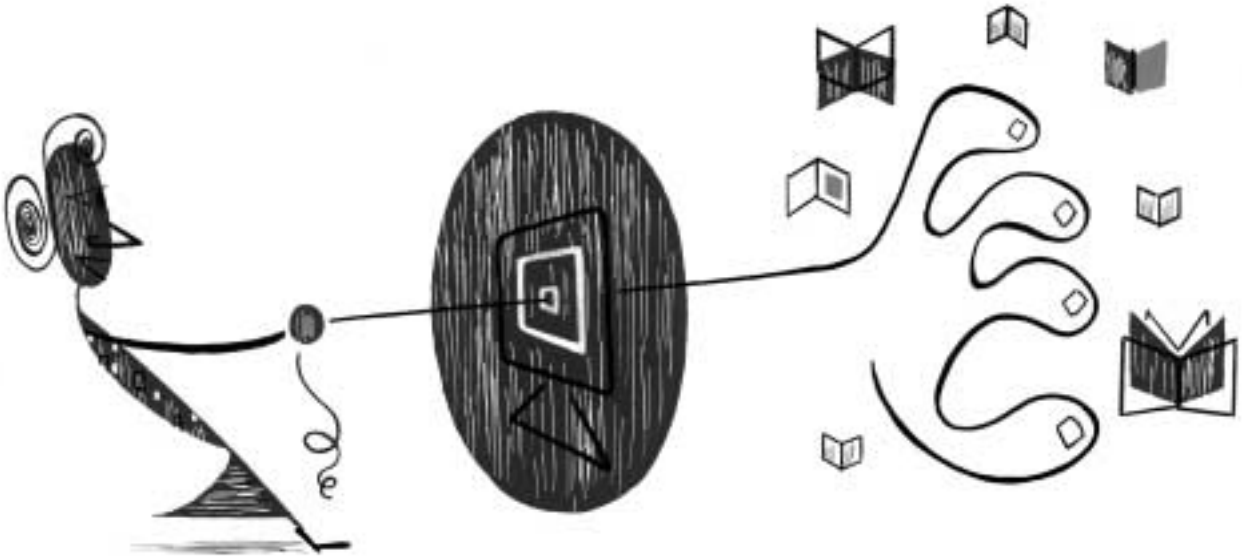
hesitant to push the technology. Furthermore, most backlist titles remain in traditional film format, so publishers face large investments if they want to digitize those books for electronic transmission. Simply eliminating the paper-and-ink version of a book does not offer a lot of savings on its own, because printing costs are only about $2 per copy. The biggest savings promised by e-books come from the elimination of the $8 in distribution costs.

Consumer acceptance also poses challenges, because reading an e-book requires the purchase of an electronic reader. The Rocket eBook from NuvoMedia Inc. currently sells for several hundred dollars, and the consumer still must pay around $20 more for each downloaded title. Although Softbook Press Inc.'s Softbook can be purchased for slightly less than the Rocket eBook, a buyer must commit to purchasing several hundred dollars' worth of content in two years. And since an e-book can hold only a limited number of titles, the consumer sacrifices the opportunity to return to the original book, or appreciate the aesthetic beauty of a fully stocked bookshelf. As a result of these limitations, e-books' popularity may be limited to textbooks and to the low-cost, mass-market paperbacks that consumers typically read once and discard.

Although no one doubts the e-book will eventually make a dent in publishing, the paper-and-ink version will continue to exist for a long time. Accordingly, another Web-enabled technology, print-on-demand, has potential for rapid growth. Print-on-demand equipment produces small batches of books using high-quality digital-copier technology. Presently, the cost, capability and quality of today's P.O.D. systems limit the scope of its applicability. For the most part, P.O.D.'s near-term advantage lies in the ability to keep lower-volume books in print much longer than before. Ultimately, however, print-on-demand supporters envision a virtual make-to-order system with printing operations at the wholesaler or even the retailer. Ingram has already launched its Lightning Press operation, which enables a publisher to send a digital copy over the Web to Ingram's warehouse in order to produce a small batch of books "on demand" using a P.O.D. system.

In order to become more efficient and to survive in the Internet era, book publishers must shift their inventory models from a "push" system, in which buyers try to forecast consumer interests, to a "pull" system, in which true demand drives the network. Print-on-demand and online retailing allow the industry to respond to actual customer demand — eliminating the age-old returns problem and dramatically transforming the industry's economics. A print-on-demand system will also provide consumers much greater access to backlisted titles that cannot be maintained economically with traditional printing.

For a variety of reasons, publishing is at the forefront of the Internet revolution. First, the product can be easily digitized, which opens up a wide range of options for delivering it to the consumer. Second, the most recognized name in Web retailing, Amazon.com, first made its mark with books. Finally, and possibly most importantly, the publishing industry suffers huge inefficiencies, and is



therefore ripe for a supply-network transformation.

The experiences of publishing, as well as other industries, suggest a number of Internet axioms applicable across a range of supply networks.

AXIOM NO. 1: INEFFICIENT SUPPLY NETWORKS ARE AT RISK

The story of the publishing industry demonstrates the degree of inefficiency that has accrued over decades, such as the practice of returning over-ordered books. The Web book retailing model eliminates the need for display inventory and improves forecasting of real demand. As a result, Amazon.com can deliver a book with inventory investments at 15 percent to 20 percent of a traditional player's, while lowering returns to 3 percent from around 30 percent. But to date, Amazon.com has only tapped part of the power of the model.

Although displaced in time, Sam Walton's story provides an interesting parallel. Starting from a handful of discount stores serving the rural consumer in Arkansas, Mr. Walton started his Wal-Mart Stores Inc. empire by displacing inefficient mom-and-pop stores, as well as slow-moving corporate behemoths such as Sears, Roebuck & Company. Ultimately, he and his successors built the largest, most efficient supply network in the world.

Had Sam Walton been a contemporary Silicon Valley entrepreneur, he would not have needed decades to build a chain of stores to reach consumers. Instead, he could have gained access to the world in the time it takes to build a Web site. Just as Mr. Walton did, new Web retailers will attack weak, inefficient supply networks. And this time, the transition will take place at Internet speed.

AXIOM NO. 2: FIRST-MOVERS GAIN ADVANTAGE FROM SCALE

By attacking inefficient supply networks, the e-tailer has room to make mistakes in the early phases of startup. As Amazon.com showed, by tapping the pent-up demand for online buying, first-movers can gain market share and economies of scale. During this phase, the biggest challenge comes from other Internet startups targeting the same inefficient network, rather than from traditional retailers. High on-time delivery represents a top priority during this phase. (For evidence, note that on-time delivery is one of three key metrics used to judge e-tailers by BizRate.com, the self-appointed e-business rating service. The other two metrics are an overall rating and the BizRate.com rebate percentage.)

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Ultimately, the online consumer won't need a dozen different Web retail sites each focused on a single category, such as pet food. Each product category will inevitably go through a shakeout when marginal players disappear. For some players, the initial investment may have only included Web-site development and a rented warehouse — fully funded by venture capital. Because the Internet entrepreneur has low exit costs, the same team can quickly re-form around a new idea with new funding — but this time with the kind of experience that can Amazon a new industry. As one venture capitalist recently commented, "In Silicon Valley, the question isn't whether you go over the cliff. It's how far out the skid marks start."

AXIOM NO. 3: NEW DELIVERY SYSTEMS REQUIRE BIG INVESTMENTS

Scale and first-mover advantages help companies survive the shakeout phase. But eventually, the Web retailers must compete head-on with the well-established traditional retail model. For long-term survival, the e-tailer needs to deliver goods in a cost-effective and timely way. Although the Web model avoids the need for physical retail space, backroom operations don't just go away. Amazon.com, which now sells much more than books, oper-

ates over two million square feet of warehouse space — over 2.5 times the amount operated by Ingram, the largest book distributor in the United States — and more space is coming.

The investment in distribution doesn't stop with bricks and mortar; in particular, the information systems that monitor customer demand and product flow require huge investments. The legal battle between Amazon.com and Wal-Mart demonstrates the size of the stakes. In the fall of 1998, Wal-Mart sued Amazon.com, claiming that the e-tailer had stolen valuable trade secrets by poaching critical employees from Wal-Mart's information technology group. According to The Wall Street Journal, Wal-Mart's information system "is second in size only to the U.S. government's," and is crucial to every aspect of Wal-Mart's distribution network.

Like Amazon.com, many Web retailers have discovered that the competition for Web-based programmers pales in comparison to the struggle for distribution expertise. Leading-edge distribution technologies, like bar-code scanners or automated storage and retrieval systems, can be purchased from a variety of vendors — but making them work properly is difficult even for those who can afford such high-tech tools. And expertise is hard to find. Although Silicon Valley may contain a plurality of America's Web experts, distribution experts tend to be spread throughout the country, in transportation hub sites like Reno, Chicago and Memphis.

AXIOM NO. 4: DEFINING NEW DISTRIBUTION STRUCTURES IS VITAL

Because the Internet advantage manifests in distribution economics, the decision to build new capacity or buy existing distributors requires a rigorous strategic assessment. Initially, startups may need only a single national distribution center, but as an operation grows, successful Web retailers will need regional distribution centers to optimize supply economics. For example, in 1999, Amazon.com built its sixth fulfillment operation in the United States, an 800,000-square-foot facility in McDonough, Ga. — a long way from its original 93,000-square-foot facility in Seattle, Wash.

Given the expense of building a new network, and the difficulty of hiring distribution experts, broad-based national e-tailers like ValueAmerica Inc. have employed existing distributors to manage their fulfillment process. Although this strategy may save money by shifting the cost of investing in distribution, it may also sacrifice a company's competitive advantage by relying on inefficient distributors. As Andrew N. Westlund, Amazon.com's vice president for warehouse, transportation and engineering, notes, "We would be the teacher and then they would offer those services to our competitors."

Getting a product from national distribution centers to consumers may be the biggest challenge of all.

Getting a product from national distribution centers to consumers is a big challenge. A Wal-Mart executive describes "the last 100 yards" — the distance from a store's receiving dock to a customer's car — as the greatest part of that challenge. But delivering the goods to a customer's home presents an even bigger challenge.

A narrowly focused, category-killer e-tailer like Pets.com Inc. uses a single distribution center, and then delivers its products through companies like the United Parcel Service of America Inc. Other new companies, like the Webvan Group, will compete against these e-tailers by combining the convenience of Web ordering with the immediate fulfillment that approximates a bricks-and-mortar operation. But having a physical inventory severely limits an e-tailer's product range. If online retailing leads to an exponential growth in home delivery, an entirely new local-delivery model could evolve to meet this need. A savvy company could become the local dot-com aggregator — providing delivery services for a broad ar-

ray of products, as well as offering installation service for products such as television sets. This aggregator would be a partner, not a competitor, of national Web retailers. It would focus on select markets and perhaps even provide a warehouse service for quick deliveries by any Web retailer.

As with other aspects of the Digital Age, the permutations are limitless — but only a few will offer sustainable competitive advantage.

AXIOM NO. 5: USE CUSTOMER KNOWLEDGE FOR PULL MARKETING

Information capture represents the most dramatic — but still largely untapped — power of the Internet. While traditional retailers offer discounts to encourage customers to join affinity programs, the e-tailer seamlessly gathers information from its customers in the course of everyday business. By tracking and analyzing ordering patterns and even "click paths," the e-tailer can develop deep insight into its customers.

The Dell Computer Corporation offers the best example. Dell created a highly responsive supply network that pulls inventory based upon real customer orders rather than pushing product based upon forecasts. Accordingly, Dell captures more accurate demand information than any competitor: Each custom-designed order shows exactly what the consumer desired, unpolluted by data on consumers who have been forced to accept a substitute system because the desired product was out of stock. With this superior information, Dell can get its suppliers to respond to customer trends faster than the competition. (See "Focus: Dell's Supply Demands," page 100.)

Ultimately, an e-tailer with a large market share and deep customer insight should become the key link in the supply network by providing the information necessary to drive product development. This is the intention of Brandwise.com, which was founded by the Whirlpool Corporation and others in the fall of 1999. The company plans to extract critical design insights by tracking how consumers make product comparisons between major home appliances. The possibility of Amazon.com contracting directly with an author to produce a new title targeted at a specific Amazon.com consumer segment seems simple in comparison.

Timothy Koogle, chairman and C.E.O. of Yahoo Inc., argued at a recent conference at the University of Virginia that new companies will crop up and challenge inefficient supply networks: "Every step in the 'food chain' is at risk if it isn't adding value in the Internet world." Unfortunately for many traditional companies, the distribution networks contain loads of low-added-value operations — as the publishing industry demonstrates. And as Mr. Koogle also noted, dot-com startups have the advantage of building a clean-slate network that harnesses the information management power of the Web.

Fortunately for traditional companies, most dot-coms lack the time and the skills to build truly optimal networks. Most dot-coms focus exclusively on surviving the shakeout period. Eventually, however, the survivors will need to address the relative economics of the Web and the traditional retail model. At that point, the basis of competition will shift to the efficiency of the supply network. Whether you are a traditional company or a dot-com startup, the same question applies: Will you be ready?

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