



Océ Case Study

Lightning Source Redefines Books on Demand



Océ and Lightning Source, Inc.

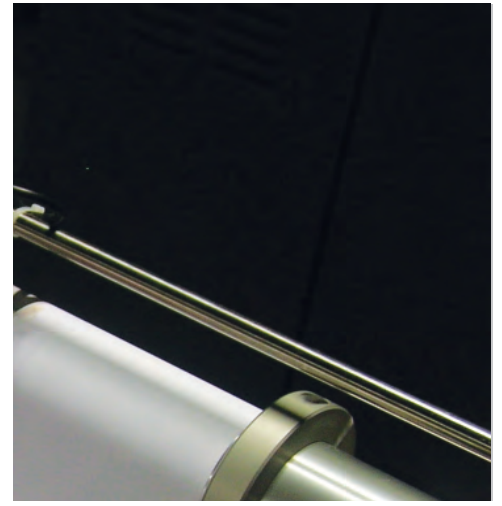
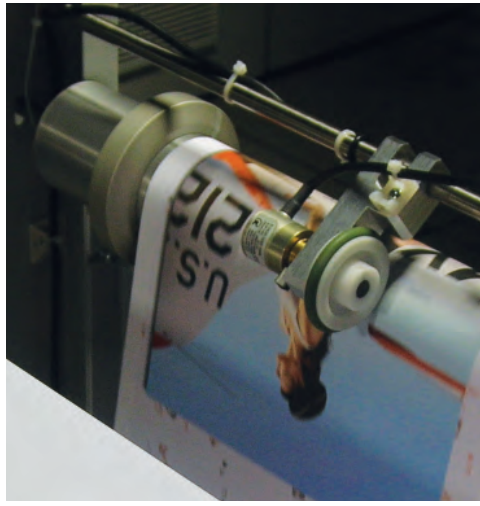
At any given moment, thousands of people order books online for next-day or two-day delivery. What they don't know is that their books aren't picked from a traditional physical inventory in a warehouse. Instead, they're printed on demand, often in quantities of one, and delivered by Lightning Source, Inc.

Headquartered in La Vergne, Tennessee just outside Nashville, Lightning Source is the innovative company recognized for making digital one-off book printing and distribution a practical reality. Since its inception in 1997, Lightning Source has successfully crossed conventional book manufacturing lines, emerging with a revolutionary on-demand production model that enables books to be purchased, printed and delivered in as little as 12 hours. Today, Lightning Source offers one of the most comprehensive packages of print-on-demand and distribution services in the world. In addition to its La Vergne location, the company supports its industry-transforming business model with production facilities in Allentown, Pennsylvania and Milton Keynes in the United Kingdom.

Lightning Source is the brainchild of John Ingram, Chairman of Lightning Source, Inc. and Chairman of the Ingram Book Group, one of the largest wholesale book distributors in the United States. With a database of over 500,000 titles and more than 5,000 publishing partners, Lightning Source has delivered more than 50 million books on demand, with an average run length of 1.8 copies. Lightning Source offers multiple service level options, with the shortest turnaround from manufacture to delivery running between 12 and 24 hours. While major trade book publishers are key customers, the company also serves university presses, large, midsize and independent book publishers and niche publishers who want to print books in small runs to minimize overprinting, returns and remaindering.

Lightning Source President, David Taylor, discusses the advances that digital book printing technology has made possible, "The supply chain in the book industry is extremely inefficient. Our vision is to collapse the supply chain as much as possible and apply the principles that have worked in other industries to get the right books out at the right time in the right quantity."

As the demand-driven print model redefines the publishing industry, Lightning Source is leading the revolution, rapidly delivering quality products at a competitive price. Not surprisingly, the company is experiencing stunning growth, and maintains its leadership position by constantly re-assessing its processes based on client needs and the latest digital production technologies.



Challenge: improving the quality of solids, halftones and graphics

For Lightning Source, the ability to meet growing demand, satisfy customers, and continue to achieve higher levels of efficiency depends on the quality, flexibility, and reliability of its print infrastructure.

In 2004, Lightning Source initiated a project to review the long-term sustainability and quality of output provided by its existing high-speed digital presses. Some of the company's publishing customers were expressing dissatisfaction with the quality of the solids, halftones, and graphics being printed for their books. Without a flexible, technologically sound platform that could improve output quality, Lightning Source risked losing major customers—an unacceptable option for the leader in demand-driven book production.

“We were at that point in our business cycle where we routinely analyze the status of our equipment. We clearly could have stepped back to sheet-fed machines to build upon the quality of our books, but we would have needed a football field to house them. We knew about Océ from previous experience, and we were interested in the Océ VarioStream 9000 technology,” says Senior Vice President and General Manager, Charles Marshall.

After investigating and evaluating the offerings of leading vendors in the industry, a team of key Lightning Source decision-makers met with Océ to develop a solution that would marry superior print quality with the speed of on-demand book printing. The Lightning Source team visited the Océ

Boca Raton Customer Experience Center to see the Océ VarioStream 9210 continuous feed printer running Lightning Source's applications first-hand. Lightning Source decided to purchase the systems once they became available with the new Océ Graphic Arts controller.

Lightning Source chose the Océ VarioStream 9000 system because it was a continuous feed system that could produce quality that approximated the look and feel of offset continuous tone. “Over time, publishers have told us they want a digitally manufactured book with offset-like quality,” says Marshall. “First they wanted offset-comparable covers and we delivered. Then, publishers were looking for the same binding quality for the spine. We delivered. Then, publishers requested the same quality for black & white interior text and images. I'm delighted to say that we are delivering on that as well. The ultimate goal of our publisher partners is that when a consumer pulls a book out of a carton or walks up to a shelf in a bookstore, the digitally printed book is indistinguishable from any other book on the shelf.”

The solution: a fleet of Océ VarioStream 9000 printers

In November of 2005, Lightning Source installed two Océ VarioStream 9210 continuous feed systems on a trial basis to determine their reliability and durability under heavy loads, 24 hours a day. The systems passed muster and in March of 2006, Lightning Source installed the two Océ VarioStream 9210 systems with Graphic Arts Controllers in its La Vergne facility, along with Océ PRISMAproduction POD software,

Unity RIPs, master servers and a failover server. The new technology integrated seamlessly with the existing front end, which puts the documents together, and hands them off to Océ PRISMA® software to create print data streams ready for printing. Since the initial installation, Lightning Source has installed 18 more Océ VarioStream 9210 systems at its three locations in La Vergne, Tennessee; Allentown, Pennsylvania and Milton Keynes, United Kingdom; along with an Océ VarioPrint 6160 digital duplex cutsheet printer for end-sheet and remake printing. The installation was smooth and uneventful. “Switching from one technology to another is like doing a heart transplant,” notes Marshall. “When you have a shop like ours, you can't miss service levels. We wanted to pull the prior technology out and put the Océ systems in without missing a beat. And that's exactly what happened thanks to a great partnership between our IT and engineering staffs and the Océ support team.”

The Océ VarioStream 9210 is a member of the Océ VarioPrint 9000 family, the industry's first platform to deliver cost-effective black & white, spot color, and full-color printing in a single device. Created specifically for high-volume, speed and/or color-intensive single-pass duplex applications, Océ VarioStream 9000 systems print black & white jobs at black & white costs, with flexibility to add one, two, three colors or more as requirements change. The unique color-on-demand concept leverages the Océ Job Appropriate Color® strategy, enabling customers to use just the right amount of color to achieve the business objective of each job. The Océ VarioStream



9210, which prints 852 monochrome images per minute, can be equipped with an Océ Graphic Arts option. With this feature, the dimensions of each individual dot can be automatically modulated to create as many gray scales as the human eye can detect.

The Print Operation Today

Today, the demand-driven print operation runs three shifts a day (24 hours), seven days a week, with an average run length of 1.8 books and an average book length of 250 pages. A typical run comprises three different 6 x 9 books printing side by side. The print operation runs IPDS, PDF, and TIFF as standard output, so Lightning Source not only runs different books side by side, it runs different PDLs side by side. HP Indigo color presses produce paperback and case-bound color book covers and books are near-line finished as book blocks exit the Océ digital presses.

Today, the company that started with two digital book lines in 2000 has grown exponentially. Lightning Source has 20 black & white book manufacturing lines and continues to experience phenomenal growth. “Many companies advertise that they can print books in a quantity of one,” says Marshall. “The trick is doing it to scale, printing tens of thousands of runs of just one book and getting

the book block and the cover matched up, trimmed down to correct size, inspected, packed in a carton and out the door or alternately injected into the book channel to a wholesaler like Ingram or Baker and Taylor or a retailer like Amazon or Barnes & Noble. It’s the distribution channel that really sets us apart. With Ingram Book, we have direct access to 30,000 bookstores around the world. It makes an extraordinary difference.”

“What truly makes Lightning Source unique is the fact that we are able to continually take in orders from 5,000 different publishers and slice and dice all that data, drop it on the production floor, and produce single unit books all the way up to orders of thousands of books going out to distributors. It’s a highly intelligent, highly systematized, really amazing process,” says Marshall.

That highly systematized process generates an average of more than 50,000 books a day, 250,000 books a week and between all three locations, 1.2 million books a month. Of the diverse mix of titles 70 percent are printed for traditional publishers and 30 percent to support author services organizations. “This entire business is built on the business proposition of printing one book on demand. Printing five is easy and printing ten is like

A Day in the Life of Lightning Source

On an average day Lightning Source:

- Manufactures more than 50,000 individual books
- Fills 27,000 orders
- Performs a minimum of 10 quality control checks per book
- Adds 500 new titles to a digital library
- Prints roughly 15 million pages
- Adds 10 new publishers



falling off a log,” says Marshall. “But runs we’re doing right this red-hot second and the runs we will do all day are lots and lots of runs of one or two books. Without digital technology, this business model would not exist.”

The result—improved halftone quality and customer satisfaction

Partnering with Océ has offered Lightning Source, Inc. numerous benefits. By providing graphic arts print quality on the Océ VarioStream 9000, Océ helped Lightning Source achieve industry-leading quality with halftones and solids. Today, Lightning Source is the first digital book printer in the world to provide the highest level of print-on-demand quality.

New process efficiencies enable Lightning Source to mix any content at any time, so there’s no need to segregate text- and graphics-intensive books—the printers can run any mix of anything at any time. “We’ve seen a jump in quality, and in customer satisfaction based on what I’m hearing from customers and book readers. The reliability is very good as well. We have Océ technicians on-site all the time and we have enough

redundancy that we can pull a printer out for preventive maintenance cycles without impacting service levels,” Marshall observes. “The most important benefit is the enhanced appearance of continuous tones,” says Marshall. “Subjectively we are now producing as close to offset quality as is possible from a web-fed digital press. We have put these images down next to books produced on offset presses, and like the ‘Pepsi Challenge’ people simply cannot detect the difference. Because the Océ systems are single-engine printers, the print heads are very close together so we do not have registration issues. We still have inspectors constantly checking to make sure registration is dead-on, but so far it always is.”

The combination of quality, reliability, speed and service is helping Lightning Source continue to build its reputation as the leader in creating a never-out-of-stock, inventory-free, print-on-demand model that is reinventing the book printing and publishing supply chain.

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For information and services, call us at: 1.800.523.5444 or visit: www.oceusa.com

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