Offset to Inkjet: The Bridge to Digital for Book Manufacturers

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Welcome to your future

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This white paper is written for the management team in businesses that manufacture books. It describes existing and emerging opportunities in the book marketplace, which is changing as a result of trends related to textbooks, consumer purchase patterns, electronic books, self-publishing and digital print on-demand technologies. Savvy book manufacturers are re-evaluating their methods of book printing and investigating new sources of revenue to keep their businesses vital and profitable. They are ushering in a new generation of book manufacturing that must be accompanied by a fresh approach to marketing.

Books have become commoditized. Print runs are low and trending toward one-offs in some segments of the market. The number of titles is increasing. Each title increases offset make-ready work and complicates workflow. This signals only one thing: lower margins.

With the right strategy and digital web platform, you can capture a larger share of the $24 billion U.S. book market, simplify book production, lower staffing requirements, lower costs, pursue new sources of revenue and increase profitability on current sources of revenue. You can thrive by evolving from traditional book printer to a value-added publishing services provider.

Not sure if our roadmap for transforming your business is fact or fiction? Read on.

From offset to digital

Many book manufacturers are asking, “Should we incorporate inkjet into our manufacturing process?” Doing nothing is not an option or the book business will get away from you, along with the business-building opportunities that digital inkjet technology offers: college textbooks, K-12 books and commercial print applications.

Some may consider the move from offset to inkjet a big leap. After all, digital electro-photographic (EP) technology, which some book manufacturers have implemented, may have room to grow in the book business. We don't think so, with trends what they are. Digital inkjet is the right technology for book manufacturers precisely because it positions you as a leader in the industry. You can satisfy the requirements of the publishers who already are familiar with inkjet, and you can confidently educate those who aren't familiar with it. In the process, you are helping both groups achieve the benefits of on-demand book printing:

- Faster time to market
- Low or no inventory, inventory management costs and warehouse pick-and-pack operations
- Fast turnaround of jobs

These are the top reasons to give the offset-to-inkjet transition serious consideration:

Quality

In past years, the quality of inkjet printers was perceived as unsuitable for commercial print work, but inkjet output resolution and screening algorithms have advanced significantly. At the current level, inkjet is comparable to litho for specific applications. In addition, as support increases for more substrates, including non-inkjet-coated paper, inkjet systems can handle more diverse jobs and applications.

Inventory

Inventory facilities and management have been very costly for publishers. Their need to eliminate or greatly reduce inventories is critical. Inkjet plays a key role in lowering inventory costs and moving to a just-in-time/on-demand scenario.

Speed

Speed of inkjet web printers has increased steadily, along with quality. As a result, you can meet extremely short deadlines.

Turnaround time

Publishers used to give you 3 to 4 weeks. Now many are asking for books in 2 to 3 days. This timing is difficult to near impossible with offset, but it is easily achievable with digital inkjet.

Run lengths

A few years ago, the average run length of a book order was 2,500 to 5,000. Now, one-offs up to 2,000 are typical.

Variability/versioning

Variable data printing is used for certain applications, such as personalized title pages. Versioning can create new revenue sources, such as trade journals that include geographic-specific advertising.

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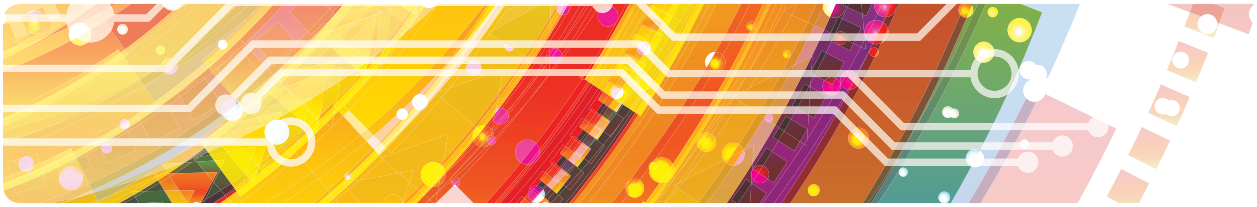

Digital inkjet or digital EP?

Historically, one-color books were produced on sheet-fed devices. Printers moved to digital EP or toner-based web presses to increase the volume of impressions they could produce. As a result, EP printers produce the majority of books produced digitally today. But EP has limitations that make it unable to satisfy current and emerging requirements of publishers and book buyers:

- Quality has maxed out at 600 dpi due to particle size, which cannot be made smaller to increase quality
- Speed, which must be set at a level that can melt toner, has reached its ceiling
- Loose web limits registration capabilities
- Process variation doesn't lend itself to stochastic screening

Inkjet technology eliminates EP restrictions because it offers:

- Smaller dot size than EP particle size, which permits higher resolution
- Support for stochastic screening, which results in higher quality and smoother halftones, which are similar to offset print quality
- Improvements in density that bring the quality closer to offset and toner
- Offset-equivalent registration capabilities
- Consistency throughout each run and from one engine to another

In addition, inkjet systems are simpler than EP, with fewer moving parts to manage, maintain and replace. The inkjet paper path is more direct than EP printers, creating fewer opportunities for glitches. Inkjet print heads are extremely durable. As a result, inkjet systems are far more productive and reliable than EP systems.

How does inkjet stack up, operationally?

The commercial print use of continuous feed (web) inkjet printers started in the one-color arena. As data processing capabilities improved, monochrome printing became easier and color printing became possible. During recent years, improvements in inkjet technology have led to operational benefits.

The technology improvements have occurred in the following areas:

- Screening algorithms
- Pixel size
- Print heads
- Ink delivery systems
- Tight web paper transport
- Speed

According to a study by industry analyst I.T. Strategies, the actual volume of e-books versus all printed books was closer to 20 to 30 percent e-books in 2012[2].

With respect to operational benefits, consider quality. Inkjet systems monitor quality levels continually, resulting in minimal variation. Offset printing involves a human element, mechanical factors and paper factors—any one of which can influence the outcome of a job.

Further, offset printing requires more people than inkjet printing to produce the finished book block. Offset involves more setups and more touches of the printing web, along with handling related to conveyors, collators and bindery. These labor-intensive steps add time and cost to produce the short runs of multiple titles that are now commonly requested by publishers.

Many books, but not all books, qualify

Inkjet is not the solution for every book you currently print offset. The cost of ink is the determining factor. While offset ink is approximately two percent of a job, inkjet ink can be 30 to 40 percent of a job, depending on coverage.

The profitable use of inkjet technology depends on careful calculation of breakpoints. And, because inkjet technology continues to improve and change, be aware that amortization is typically three years compared to 10 years for offset equipment.

From a cost/revenue standpoint, current breakpoints that favor inkjet over offset are:

- Monochrome books: 1,000 to 1,200 copies
- Two-color journals: 1,500 to 1,750 copies
- Four-color books: 200 to 2,500 copies

A new chapter for book manufacturing

The book manufacturers who have a mix of offset and digital equipment typically have one- and two-color offset presses for longer runs and sheetfed and web EP equipment for shorter runs. EP printers work well for monochrome books but are not viable for two- and four-color work. And, with publishers requiring shorter run lengths, higher quality, faster turnaround times and lower costs, these printers may not be able to continue to meet delivery requirements for monochrome books.

Run length is the primary impetus for you to change technology. Historically, a one-to-two year supply of books involved a run length of 2,000 to 5,000. Large publishers like Pearson, McGraw-Hill and Cengage, however, have moved to digital build-a-book solutions. Under this arrangement, they contract with a professor to write a book, for example, which is sold to students in the classes of the professor. Because information changes so quickly, a book may be outdated in six months. Professors can pull chapters from existing books and/or write new chapters and create a book for each semester.

What does this mean for the book market? The students are a captive market. The used book market is eliminated. Inventory is eliminated. It's no surprise that custom publishers like these outcomes, and they are driving the market in the direction of custom-built books.

A similar transformation is underway in K-12, although it is not as far along as college textbooks. Historically, run lengths in the K-12 segment were in the hundreds of thousands, and these jobs were often outsourced to China. The long run lengths were common because a book was adopted by a state, which placed the book in all schools in the state. Now that states have less money for education, school districts and charter schools are writing their own books. The result is that the K-12 segment trends align with publisher trends: lower run lengths, more titles and shorter turnaround times.

E-readers are influencing the book market, too, in that they push digitized content and support digital book production—a trend that complements digital print devices. Initially, a book is downloaded and read electronically. Many readers, however, are inclined to purchase hard copies of books they like. As a result, the short-run trend favored by publishers who want to reduce inventory and eliminate obsolescence is matched by a book-of-one trend favored by providers like Amazon.

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Workflow or workflaw?

It's one thing to manage one order involving one digital file and a thousand copies of a book. It's another thing entirely to manage 100 files and orders of varying run lengths—one copy or 20 copies or 500 copies. To manage orders now, you may use a home-grown software application or a well-worn clipboard. Business growth, however, is dependent upon a comprehensive workflow solution that automates every step from order receipt through shipping.

Publishers and consumers want and expect the entire customer experience to be easy, fast and accurate. The more efficient you can make production and turnaround, the more "sticky" you can become to your customers. Getting to this point, however, involves careful planning and implementation, along with aggressive employee and customer education. A worst case scenario is that you build it and no one uses it.

Think about workflow in three stages: (1) the order, which includes pre-production steps like order submission, ticketing and preflight; (2) production, which includes moving tickets to the floor, impositioning, and tracking orders through finishing and marrying covers with book blocks; and (3) closing the loop by capturing production costs, shipping information, etc., and sending this information upstream for operational use and reports.

The objective is to eliminate as many manual touch points as possible to streamline the entire process from order entry through shipping, including the appropriate employee and customer communications. With automation, you know at every moment the status of each job, down to "off press and in slot A ready to bind."

Let's consider a couple of examples in the workflow process. One example involves the way you receive the book files or PDFs and create job tickets. Some customers may expect you to go to their FTP sites and fetch the files and create the orders, which is not efficient. Manual ticketing consumes a lot of customer service and scheduling time, and you may not know that you are writing up the same job 100 or more times. Other customers may be more knowledgeable and send a purchase order with a URL that links to the PDF file location. This is better because, with automation, the purchase order can go directly

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to MIS and the PDF file can go directly into the print system for dynamic job ticket creation. Even better is web-to-print workflow, which allows customers to submit orders on your website, which feeds into dynamic job ticketing and the other steps in an automated chain of events. With dynamic job ticketing, a customer service representative simply reviews the job, confirms the ticket and pushes it to production.

Another example is impositioning. When it is automated as a step in workflow, you can achieve substantial benefits:

- Automates the production of cut-and-stack books by creating queues using any number of ups
- Eliminates paper waste by grouping similar length books together
- Automates multiple hundred page books by printing a single book in multiple stacks
- Sends books to print as they are processed, meaning continuous feed to the RIP
- Saves template information and preferences to a hot folder, which you can place on an FTP site for customer use
- Saves time with dynamic templates that automatically adjust page size and marks for different sizes of books within an order

Automating your workflow is the path to efficiency and profitability. One book manufacturer-specific solution is RICOH TotalFlow Cadence for Publishing. It automates and tracks each copy of a book, as well as direct mail, marketing collateral and other print projects, should you want to expand beyond books. With this solution, processing starts when the hot folder receives a job ticket, such as XML or JDF. Book blocks and covers are produced separately and come together at the bindery. The software makes sure that all copies of all books in a job ticket are complete before considering the job ticket complete. And, the solution supports overage calculations. Key capabilities include:

- Reprinting and finishing damaged books automatically
- Ganging books from multiple job tickets to enable production efficiencies
- Enabling operators to manage jobs through the production process using barcode scanning instead of keyboard and mouse
- Making predictions about which printers to use, based on the job and printer speeds
- Reporting on job tracking and other functions
- Managing service level agreements by setting job checkpoints that let you track the progress of jobs as they flow through the system

Run length is the primary impetus for you to change technology.

Leading edge or trailing edge?

The size of the book market is approximately $24 billion in the U.S. What is the most direct route to capturing a larger share of it?

One strategy is to move qualified jobs from offset to inkjet to accommodate shorter run lengths and shorter turnaround times and to enable new capabilities, such as versioning. Another strategy is to move monochrome pages from EP systems to inkjet to reduce cost, expand capacity, increase efficiency and create a bridge to two-color and four-color projects. It's likely that you can amortize the cost of the inkjet equipment based on your current volumes.

A move to inkjet technology, however, calls for a change in your business development and marketing practices. You must educate your customers because many are not familiar with inkjet technology, and they may not have accurate expectations of quality or substrates.

We recommend the following roadmap, which requires proactive education of and promotion to your customers and prospects:

- Two-color journals with geographic-specific advertising. Academic and commercial associations in many industries publish journals, and you can offer them a method of printing that provides new, ongoing revenue.
- Four-color books. Publishers may not think about four color as an option for their books, and printers don't typically inquire about four-color work.
- Commercial projects, such as election ballots, Precision Marketing, and applications from publishers and other customers that can be produced using your digital output solution. These applications include targeted direct mail, critical communications and other high-value documents that depend on customer data analytics.

Closing thoughts

Several trends are affecting the book publishing industry, and they support the transition of qualified pages from offset to digital inkjet. Further, we believe that leading-edge book manufacturers will see the value of transitioning monochrome digital EP pages to digital inkjet as a bridge to color.

When your business is equipped with digital inkjet capabilities, you can pursue new sources of revenue in the book publishing arena as well as the commercial print arena. And, you can improve profitability on your current book projects because inkjet technology can improve reliability and productivity and lower costs.

ENDNOTES

[1&2] Research commissioned by Ricoh and conducted by I.T. Strategies in 2013.

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IPRW03021-USEN-01