

Digital and Offset

Crossover Point Considerations

ANALYSIS

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INTRODUCTION

Today's print service providers (PSPs) typically use a mix of print technologies that include toner-based digital, inkjet digital, and offset lithography. Many factors determine which technology is used for a given job, but certainly run length, cost, and use of color are among the most important in determining the economic crossover point between technologies.

In 2023, Keypoint Intelligence conducted an in-depth interview-based survey of thirteen PSPs in the book market. The resulting report was entitled "The Evolution of the Book Printing Market: Meeting the Needs of Publishers in the Internet Age." During these interviews, book printers shared insight on their decision-making processes for choosing the right technology for their jobs. This document reviews the conclusions from this report and draws out factors that apply across a range of print applications.

COST FACTORS IN PRINT

When PSPs own multiple print technologies, they are faced with the ongoing question of which device to run a print job on. This often comes down to considering crossover points. In other words, at which point (typically based on run length) is one print technology at an advantage over another?

In the simplest of terms, the general technology outlook is as follows:

- ◆ **Cut-sheet, toner-based production color printers:** Generally used for on-demand and shorter run length jobs.
- ◆ **Roll-fed, production inkjet printing systems:** Frequently used for higher volume applications rather than cut-sheet toner-based systems.
- ◆ **Sheet-fed or roll-fed offset lithographic printing presses:** Well-suited for longer run applications, though automation techniques have made offset increasingly competitive for shorter runs.

There are certainly some exceptions to these categories, including cut-sheet inkjet and roll-fed toner devices, but these three categories cover many of the products on the market today. PSPs want to know where the crossover points lie between these technologies. Unfortunately, the answer is often a bit complicated.

The two biggest questions from a cost perspective are:

- ◆ Can offset lithography compete with toner-based and inkjet digital printing systems at low run lengths?
- ◆ Similarly, at what point do the most productive production color inkjet systems stop being competitive with offset?

We will look at these questions from the perspective of book printers.

CROSSOVER POINTS FOR A COLOR BOOK

Determining a crossover point involves a lot of different variables. You have to be very specific. In Keypoint Intelligence's research, the study's authors chose a book example in which factors like page count, book size, paper, binding type, and use of color were identified for the purposes of the discussions with book printers. A generic 6" by 9", 250 page, perfect-bound book with a color cover and black & white text block using standard paper stocks was chosen for comparison.

In the survey, PSPs with production color inkjet systems reported that they were unlikely to handle run lengths much higher than 3,000 to 5,000 books. Automated offset technologies (e.g., Timson Zero Makeready presses) were reported to be very competitive down to around 300 to 400 books.

For those sites offering book-of-one capabilities, average run lengths in the range of one to two copies were reported. Generally though, short runs on digital print tended to average in the range of 100 to 250 books. Keep in mind that shorter runs are becoming the norm in book printing. For example, one of the PSPs that had digital and offset technologies reported that their average run length across all technologies was approximately 1,800 books. This does not seem atypical.

It should be noted that for book printing, multiple technologies are likely to be used between the cover and the book block. Cover printing is largely the domain of cut-sheet toner or inkjet-based devices unless the quantities are high enough to consider using offset. B2 format or long-sheet-capable digital systems are often used for book covers because a typical soft-cover book cover may be too long to fit within the largest sheet format of a toner-based digital printing system.

It has become clear that the trend toward lower run lengths in the book market has strengthened the position of production color inkjet, but it also introduces the question of whether using a four-color device for monochrome book blocks is an efficient use of resources. The work mix of most PSPs that Keypoint Intelligence spoke to is heavily weighted toward black & white. Many reported that only 10% to 20% of their book blocks are color. Some were closer to 30% or 40%, but in this survey it was the rare PSP whose application mix was anywhere close to 50% color. Part of this is due to the historical paper stock limitation of production color inkjet systems. As that is resolved and additional coated stocks become available, you can expect more color books to move to inkjet. By that same token, if publishers fully realize that affordable low-coverage color can be had for prices similar to black & white only, that may drive a shift for limited color use for headings or graphics.

TWO PHILOSOPHIES

In conversations with book printers who use high-speed roll-fed inkjet systems, there was a remarkable split in implementation philosophy relating to the use of offset lithography.

- ◆ **Offset is a necessity:** On the one hand are sites that have roll-fed inkjet printing systems and one or more offset presses. These companies maintain that they need both technologies to serve their customers effectively. They can run their offset very efficiently down to low run lengths (~350 books), but they also value offset presses for their ability to be cost-effective for longer runs of 5,000 or more.
- ◆ **No use for offset:** On the other hand are roll-fed inkjet sites that have either eliminated offset entirely or plan to do so soon. They cite the production capability of inkjet, its operational simplicity, and the ease of finding and training operators (compared to offset). They see their customers' run length needs declining and believe that their inkjet systems will serve those changing needs well. They happily cede longer run work to their competitors. They want no part of the long-run market and instead are focused on book-of-one runs, short runs, just-in-time manufacturing, and efficient warehousing services. Some of these inkjet-focused sites are just waiting for their litho press operators to retire before mothballing their offset technology. Training the next generation of offset press operators is a challenge they do not wish to face. Repeatedly, the owners of these sites said that they see inkjet as the future.

For those few sites that had only offset technology, their complaint about inkjet systems was the cost of the consumables. These sites did not see a place for inkjet and were happy to let other providers handle shorter runs. That being said, automated offset processes enable them to be quite efficient. Depending on the book's specifications, they can sometimes be cost-effective for runs as low as a few hundred books.

One of the respondents with offset and digital print capabilities said that although they use offset for other parts of the business, their book work is 100% digital. This shows how the decision about the use of any print technology is dependent on the needs of the specific print application.

FACTORS UNRELATED TO COST

PSPs with multiple printing technologies make decisions about which device to run a job on based on a range of factors separate from cost, including:

- ◆ **System availability:** Digital printing systems may be used for longer run jobs if the PSP's offset presses are occupied with other work. By the same token, offset presses may be used for shorter run jobs when the digital print systems are in use or if a customer requires it for reasons that may involve paper type or matching output with other job components.
- ◆ **Area coverage:** Due to the price of the ink for production color inkjet systems, the amount of area coverage on a page may come into play. Jobs with high coverage may be shifted to offset even if run length or other factors might have been seen to favor the production color inkjet system.
- ◆ **Paper type:** If a customer requires a given paper type but that paper is only available on one system, then that system wins—unless the cost penalty is so high that it requires delaying the job until a new paper order arrives.
- ◆ **Getting parts for offset presses:** Book PSPs in this study were concerned about their inability to get parts for their Timsons offset presses. This concern was heightened for book printers because of the financial issues faced by the company that produces Timsons presses.
- ◆ **Operator accessibility:** Respondents in this study felt that training new operators was an issue for offset, while digital operators could be trained relatively easily. Those shops currently doing a small amount of offset printing were expecting to drop offset entirely when their current press operators retired.
- ◆ **A business model based on service rather than price:** Book printers who did not have offset chose to focus on just-in-time manufacturing, print-on-demand, and highly automated warehousing and fulfillment processes. They were happy not to have offset anymore, even knowing that they would lose longer run jobs to price-based competitors. This also underscores that much of the book market has moved to lower run lengths and print on demand, and that there is only room for a smaller number of long-run book printers.

HOW DOES THIS RELATE TO OTHER PRINT APPLICATIONS?

As one considers how the results of Keypoint Intelligence's book study apply to other print applications, a few factors stand out:

- ◆ **Multiple job components:** Books are not entirely unique in the fact that they are made up of at least two major print components. Direct mail and transactional documents include letters, inserts, and envelopes. Comparing cost levels and crossover points requires an understanding of each of these components.
- ◆ **Page count and binding type:** Cost calculations must be tied to the nature of the application. For example, books are not the only print application that uses multiple pages or binding types. These also come into play with booklets, brochures, calendars, and other applications.
- ◆ **Color:** Use of color and the amount of color in a document are important factors in determining cost crossover points. Giving clients the opportunity to use color cost-effectively is a big potential advantage, particularly through the use of production color inkjet systems.
- ◆ **Creative imposition techniques:** Page and job imposition have had an extensive impact on the ability to automate both offset and digital print workflows. For offset, the ability to merge multiple jobs effectively on a press sheet is a key factor allowing shorter run jobs to be printed economically. In the same way, book of one and on-demand printing methods become more attractive when jobs are imposed in new and innovative ways.
- ◆ **Promoting the use of color:** Increasing the amount of color print, as well as better leveraging of production digital print resources, were also on the minds of the respondents that Keypoint Intelligence surveyed. It should be noted that for some of these sites, particularly those with offset presses, digital print represents a relatively small portion of their overall output. Over time, they wish to increase the amount of volume on their digital print systems.

OPINION

From this study, it's clear that book printers see digital print as the only solution for short runs, on-demand printing, and books of one. For the most part, digital print reigns supreme in runs from one to about two hundred and fifty books. Roll-feed inkjet digital printing systems extend this reach in the book market to as high as 5,000 books, though at the higher end this tends to be in cases where the PSP does not have the option to use offset. Automated offset press technologies are efficient enough to handle lower run lengths (into the hundreds of books), though this depends—as all cost calculations do—on color, area coverage, page count, paper type, and system availability.

Perhaps the most striking result of this research is how greatly the mindset of book printers with no offset is different from those that offer both offset and inkjet technologies. Digital printers who have production inkjet systems but no offset believe that inkjet is the future. Book printers with offset presses see the technology as essential to their businesses. They do not believe that they could adequately serve their customers' needs without offset. Meanwhile, virtually all PSPs serving the book market are working on automating their workflows and providing warehousing and distribution services.

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Comments or Questions?

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