



# DIGITAL PRINTING IN AN OFFSET ENVIRONMENT

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## INTRODUCTION

For many print service providers, digital printing once was a novelty and a secondary source of revenue. Today digital production is an economic mainstay of the industry as well as its fastest growing segment<sup>1</sup>.

Printing Industries of America (PIA) says that digital print currently accounts for about 22% of printers' shipments and could grow 2.5% to 3.5% through 2020.<sup>2</sup> According to NPES, the equipment manufacturers' trade group, the market for production digital presses accounted for two-thirds of the total market for printing equipment and supplies in the first half of 2015.<sup>3</sup>

What these numbers indicate is that sooner or later, most offset-only printing plants probably will be on their way to becoming hybrid (offset and digital) production environments. Fundamental changes in the demand for print are making dual-capability production a matter of business necessity for printing firms of all types and sizes. This white paper is presented as a guide to

decision-making for offset printers who do not yet have digital equipment. It will review technologies, applications, and customer considerations. Its goal is to show that offset and digital are not rival technologies, but complementary solutions that create a stronger business base for hybrid plants where each process is used to do what it does best.

Section IV (Applications) discusses the need and demand for digital printing in detail. But, the simplest way for printers to judge the urgency of "going digital" is just to listen to their own clientele. What they will hear is that the buying habits of today's print customers have finally caught up with the possibilities that digital printing solutions have offered since they first began appearing 30 years ago.

<sup>1</sup> Smithers Pira, "[Digital print market to reach \\$187.7 billion by 2018](#)"

<sup>2</sup> Printing Industries of America, "[Digital Printing and Ancillary Services](#)"

<sup>3</sup> NPES, "[Trends in Shipments for Equipment and Supplies and the Total Market](#)," October 14, 2015

Now as then, digital presses differ from conventional offset and DI (direct imaging) offset presses by being non-impact printing systems. This means that they use neither plates nor any other type of physical image carrier. Impact (litho, flexo, and gravure) printing systems reproduce fixed images by transferring them over and over again, usually in large quantities, from their plates or cylinders to the substrate. Non-impact systems replicate images by creating and re-creating them as virtual printing forms with each “click” or operating cycle of the machine.

The difference between conventional reproduction and digital replication is crucial. Conventional printing favors large runs because it spreads the fixed costs of reproduction—mainly platemaking and press makeready—across the total number of copies printed. The bigger the run is, the less expensive the prints will be on a unit-cost basis (i.e., per piece). In contrast, the smaller the run, the more costly it will be to produce.

With plateless, push-button digital printing, on the other hand, there are no conventional fixed costs to account for. As a result, every print costs the same regardless of the number produced. In small quantities, the unit cost usually is lower than it would be if the job had been run on an offset machine.

This makes digital printing economically attractive for short runs—which is exactly how printers’ customers are

ordering more and more of their printing. Something else that customers take for granted is buying print on their terms: when they want it delivered, not when the printer’s offset press booking schedule permits; and in whatever quantity they require, not in quantities dictated by offset volume price breaks. It’s called print-on-demand, and digital presses are the platforms on which it can be most effectively delivered.

Digital presses also can print variably by changing the content in the virtual form from one print to the next—something that conventional presses, with their fixed image carriers, are unable to do. This unique feature goes to the heart of what makes a digital press “digital”: its native ability to turn streams of data into printed output. The best part is that a networked, Internet-connected digital press can get its data from anywhere: a workstation in the next room, or an office halfway around the world. With digital production, the data can be distributed, and the printing can take place wherever it is needed—a reversal of the centralized print-and-distribute model that governs conventional production.

Digital printing won’t diminish the role of conventional offset in plants where offset is well established. Each process has strengths it can play to, and in a hybrid production environment, the synergy of the two processes yields a powerful competitive advantage. Chosen correctly, a digital press can be the best friend an offset press department ever made room for.





## Format size.

The printing formats of digital presses generally are smaller than those of offset presses. However, many commonly produced commercial items run very efficiently within the paper dimensions that digital equipment is designed to image and print.

For sheetfed presses, the B3 format size (approximately 13" x 19") is a popular choice. Web presses feeding rolls up to about 21" wide are standard in that category, although machines with wider rolls also are available for publication work. The manufacturers offer various options for extended sheet sizes and variable web printing lengths to make the equipment even more versatile.

## Running speed and press capacity.

The rate of output of sheetfed digital presses is expressed as impressions per minute (ipm) simplex or duplex, numbers that vary according to the size of the sheet being printed. Letter-sized impressions per minute and feet per minute (fpm) are the speed metrics for web presses. Digital presses are not as fast as offset presses, but they close the performance gap by being much easier to get into production for large numbers of jobs in quick succession.

Every digital press has a duty cycle: a production capacity, expressed as a number of impressions per month, that the machine is designed to fulfill with maximum efficiency. The volume of work that a plant expects to place on a digital press should correspond to its rated duty cycle.

## Resolution.

The number dots per inch (dpi) of output resolution defines print quality in digital production. Resolutions range from 600 x 600 dpi in inkjet to as high as 2,400 x 2,400 dpi in toner. At these high resolutions, the quality of digital printing will equal the quality of offset in the eyes of most print buyers.

## Color gamut.

Digital presses may be monochrome or multicolor, depending on the kinds of work they are designed to do. Full process color is standard for multicolor digital printing, and the advanced CMYK toners and inks in high-resolution digital equipment can easily satisfy most commercial color requirements. Some presses have options for additional spot colors, expanded color gamuts, gloss optimization, and specialty inks if these features are needed.

## Variable data printing (VDP).

This specialty within digital printing does not represent a large percentage of total digital print output, but it has major applications in transactional and transpromotional printing as well as in personalized print communications such as 1:1 direct mail. Digital presses can print static (unchanging) as well as variable content; design and workflow software that support VDP are needed for the latter.

## Paper handling.

Many of the same stock weights and finishes commonly used in offset production also can be processed on digital equipment. Sheetfed presses feed paper from multiple, large-capacity drawers for non-stop production, and they can mingle different types of stock within a job. Web or continuous-feed printing can be done from roll-to-roll, roll-to-folder, roll-to-cutter, or roll-to-inline finishing.

## Inline finishing.

One of the most productive aspects of digital printing is the fact that equipment for finishing the printed pages can be connected directly to the press for uninterrupted processing. With inline finishing, there is no need for a separate postpress department—the printing cycle is blank paper in, ready-to-ship product out. Options for integrated finishing include stapling and saddle stitching; folding and trimming; bookletmaking; punching and creasing; and perfect binding. The inline attachments may come from the press manufacturers themselves or from third-party providers.

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# DIGITAL PRINTING SOLUTIONS - WORKFLOW

Digital presses are extremely capable devices, but it is not going too far to say that they are only as capable as the software that directs them.

Workflow software delivers jobs to the press and sees to it that they are correctly printed while keeping the press in synch with the overall manufacturing environment of the plant. Workflow simplifies and streamlines pressroom operations by combining quality assurance, production control, and business management functions in one cohesive process. This ensures that the progress of all jobs will be visible and manageable at all times—the key to the efficient and profitable use of digital printing equipment.

Workflow consists of many different tasks, and workflow architectures will vary from plant to plant. Among the most widely used features and capabilities of workflows for digital printing are:

- job scheduling
- RIP\* management
- press monitoring
- color management
- color collaboration
- spot color control
- job queue management
- print job routing
- load balancing
- job file editing
- datastream conversion
- VDP processing

\*RIP - Raster Image Processor



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Besides production management, workflow's other main function is manufacturing integration. This means making two kinds of data connections: between the press and other production devices; and between the press and the plant's various operating systems.

A digital press needs to be in two-way data communication with its inline finishing equipment and with other digital presses sharing its workload. It also must be able to feed job and running data to the plant's management information system (MIS), enterprise resource planning (ERP) database, and e-commerce setup as applicable. Workflow is the bridge to all of these operations.

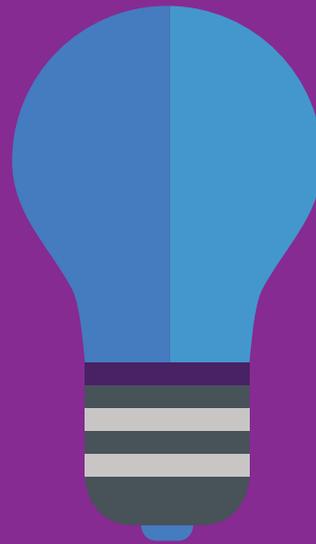
The digital front end (DFE) that is installed along with the press acts both as a control console for the device and as an administrative portal for the workflow driving it. The DFE may be provided by the manufacturer of the press, or it may come from a third-party source the manufacturer recommends. Depending on its processing power and the number of RIPs built into it, a DFE could be assigned to control just a single digital press or multiple devices in a fleet.

A DFE can do many things, but how much work it does is the user's decision, not the system's. As the task list above indicates, a DFE can be configured as a multi-capable prepress workstation where color management and similar tasks are carried out. This type of downstream workflow is ideal for plants that prefer to have their press operators retain some control of key functions. It also provides flexibility for late-stage job changes. On the other hand, in plants where prepress takes place upstream of the press, the DFE's role will be to channel print-ready jobs to the press and monitor the progress of the run.

Common to both scenarios is an automated workflow that ensures the press is being put to its highest and best use and that jobs are getting into production as efficiently as possible. This is why supporting a digital press with the right combination of workflow and DFE is frequently a high-priority aspect of the purchasing decision.

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## APPLICATIONS

Where does a digital press fit into an offset printing business model? In terms of product applications, almost anywhere. There's little that can be produced on an offset press that can't also be run on a digital device. The rationale for digital printing isn't about the items a digital press can print—it's about how the press can deliver them in ways that serve customers better.

Print is a medium—one of a number of media that printers' customers are buying in support of their multichannel marketing efforts. Today, media buyers expect flexibility, rapid response, and targetable distribution in all of the channels they use. These qualities are precisely what digital production brings to print-based communications.

Digital printing is flexible because of its versatility—whatever the job consists of, a digital press probably can run it. With no plates to hang, blankets to wash, or ink fountains to adjust, a digital press is a rapid-response manufacturing system that can get into production almost as soon as the job file is in hand. The ability to produce in small quantities for selected groups of recipients, with or without 1:1 personalization, makes digital printing highly targetable. Each of these facts is a key selling point to include in conversations with customers.

Another is the cost-saving potential of short-run production. By making short runs faster and less expensive to produce than they would be with offset, digital printing lets customers order exactly the quantities they need at whatever point the need arises. Eliminating offset minimums for these jobs means the customer will not have to tie up cash in excess inventory that may or may not be fully used. Because job files can be stored for quick output at any later time, re-running work for additional copies or for updated content becomes cost-efficient as well.

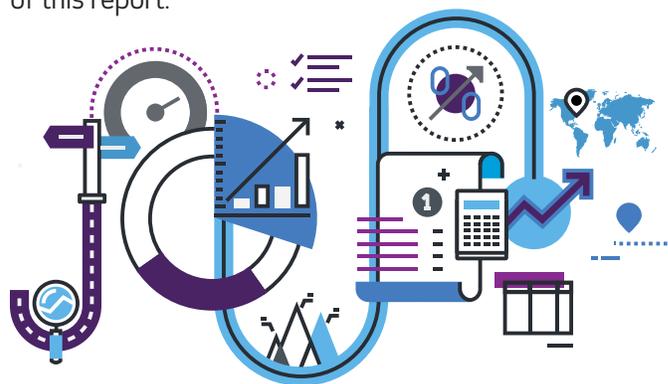
Digital printing's benefits for small-volume production are its strong suit—but the usefulness of a digital press isn't limited to very short runs. Some digital presses can retain their unit-cost advantage in quantities that also would be high enough to run economically on offset equipment. This

is because gains in digital press performance have changed the unit-cost breakeven between the two processes, enabling newer digital presses to be more cost-efficient in larger quantities than older digital devices.

In hybrid production environments, the offset-supplementing capability of digital presses is good news. Shifting offset jobs with relatively low volumes to digital equipment frees time on the conventional presses for longer-run work. When there is a digital press to turn to, jobs requiring offset-quality printing on tighter turnarounds than the offset press department can handle have a way to get done. Full-size offset presses no longer have to be used for small-format work that does not fully utilize their capacity: those jobs now can go to the digital pressroom instead.

Digital presses expand the production repertoire in other ways. With inline finishing, a digital press is more than a printing device—it is an integrated print factory that adds value and profit margin to the job at every stage of the process. As an expansion of service to customers, jobs can be prototyped and produced in small quantities for market testing. Plants that learn to leverage the variable-data potential of digital printing can position themselves as expert marketing service providers by greatly increasing response rates of digitally printed direct mail and other VDP-enhanced products.

Printers who install digital equipment usually do not need much time to fully appreciate what the technology can do for them. Then the task becomes communicating the benefits to customers—the subject of the next section of this report.



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## CUSTOMERS

The new digital press is up and running—but how is it going to be received by the people who are expected to buy what it produces? That depends on which category of understanding they belong to:

- customers who know little or nothing about digital print technology
- process-agnostic customers who aren't particular about what printing method is used as long as jobs are completed to their satisfaction
- customers who are well-versed in digital printing and understand the benefits and applications

- customers who are somewhat familiar with digital printing but have reservations about its quality or value.

This white paper describes a number of benefits that printers can cite in order to educate members of the first group: speed, convenience, product flexibility, and production economy in small quantities.

These pluses should be equally convincing to the second group, but a useful tactic here might be to do a “comparison test” that shows the customer samples of a given job run on both offset and digital equipment.



This will help the customer to start thinking in terms of planning to print digitally—conceptualizing jobs as digital projects from the ground up so that they can take full advantage of everything that digital production has to offer.

A printer's most technologically savvy customers probably won't need much cheerleading when it comes to digital printing. As sophisticated print buyers, they are well acquainted with everything it is capable of and may even be evangelists for it themselves.

Print buyers with this high level of expertise, however, are exceptions to the rule. More frequently encountered are customers who have reservations—not necessarily arising from personal experience—about the reputation of digital printing. While there may have been valid concerns about the process in its early days, steady advances in digital press design have swept them away.

Apart from simply showing hesitant customers how good digital printing looks and how well it performs, the best way to win their confidence is to remind them of how much quality-enhancing technology is built into a digital press. The Canon imagePRESS C10000VP Series digital color production presses, for example, use color-stabilizing toners, inline spectrophotometric measure-

ment, and automatic color correction to deliver consistent, top-notch results. Thanks to ongoing R&D by the digital press manufacturers, digital printing has the ability to please even the most demanding customers.

Nevertheless, getting customers to embrace digital printing calls for a different selling strategy than most offset shops are used to. With its inherent economies of scale, offset shines in high-volume applications. It's primarily for delivering the kinds of messages that are most effective when mass-produced. Digital is different. Here, the persuasion should focus on problem-solving on a more intimate scale: using digital's unique capabilities to help customers forge new kinds of connections with their clients in ways that would be difficult to achieve with conventional print.

To be successful at this, printers must thoroughly understand the businesses their customers are in. The good news is that digital printing naturally drives the business model in this direction. A shop that puts in a digital press is and always will be a printing establishment, but it is also something else: a service provider that thrives on the special kinds of creative partnerships that digital printing makes possible.

GETTING CUSTOMERS TO EMBRACE DIGITAL PRINTING  
CALLS FOR A **DIFFERENT SELLING STRATEGY** THAN  
MOST OFFSET SHOPS ARE USED TO.



## SUMMARY

Selecting a digital press is one of the most significant investments a printing business can make. The investment must be made not only with care, but with vision: a clear conception of how the business can grow and change with digital print as its premier value-adding, loyalty-building production service.

The purchasing decision should start from the premise that the purchaser's needs are unique because of its client base, the type of work it handles, and the way it manages customer relationships. These attributes define the capabilities the device should have and the features it should be equipped with. The press vendor's appreciation of this uniqueness and its implications for planning the investment should be as genuine as the printer's.

For the purchaser, there is no substitute for due diligence. Volumes of good information about digital printing and digital presses are available in the print industry trade media, at equipment exhibitions like Graph Expo, at association-sponsored technical conferences, and in online forums. The press vendors publish worthwhile content of their own in the form of product literature, videos, webinars, and white papers. Studying this material will pay off in a better informed, more confident investment.

Purchasing a digital press isn't a snap decision, nor should it be. It can involve multiple visits to vendors' demo rooms, inspection tours at plants where the equipment is installed, and many hours of fact-finding and negotiation with sales and technical representatives. It should always include test runs of the prospective purchaser's files on the device being considered—actual jobs selected to push the limit of what the press is claimed to be able to do.

Buying a digital press is about acquiring more than just a machine. With the hardware will come operator training, a service agreement, a software upgrade path, a consumables contract, and a relationship with a technology provider that wants the connection to be a permanent one. Vendors earn the privilege through the quality of their products and the reliability of their support. Purchasers should set the bar equally high for both.

As was stated at the beginning of this report, a digital press probably is waiting in the near future for most offset plants that do not already have one. That's something to look forward to with optimism then—and to plan for with enthusiasm now. Canon Solutions America welcomes the opportunity to help offset printing businesses chart their own courses to productive, profitable digital printing.

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## ADDITIONAL RESOURCES

### [Industry Center: Digital Printing](#)

(articles, blogs, videos, webinars, books) (Printing Impressions)

### [PODi Institute: Blogs, Case Studies, Sales & Production Resources](#)

(PODi, the Digital Printing Initiative)

### [drupa 2016 Expert Article: The Future of Print \(Messe Düsseldorf\)](#)

### [Software Solutions \(Canon Solutions America\)](#)

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## ABOUT PRINTING IMPRESSIONS

Printing Impressions publishes authoritative coverage of industry trends, emerging technologies and the news in the graphic arts industry with a specific focus on the commercial print segment. Its core audiences include commercial printers, package printers and in-plant printers. Printing Impressions provides C-level managers, production managers, and operations and sales/marketing managers with critical information and news, cutting-edge technology features, case studies and company profiles. ([www.piworld.com](http://www.piworld.com))

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Patrick Henry is a journalist, an editor, and an educator who has covered the graphic communications industry for more than 30 years. He has written for most of the industry's principal trade media and has been chief editor of several of its leading publications. Henry holds numerous awards for editorial excellence and has been recognized for exceptional service to the industry, particularly in education.

This analysis was commissioned by Canon Solutions America and NAPCO Media to help printers better understand how today's technology can optimize their production and how they can benefit by adopting these solutions.

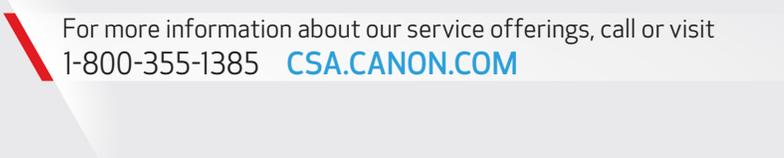
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