

Trends and New Applications for Digital Communications

Part 2 of a Two-Part White Paper
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Abstract

Despite what you may think, digital printing by itself has not changed the face of commercial printing. Instead, it has helped print service providers better cope with a changing market for print. Systems such as the Kodak NexPress Platform allow printers to offer high-value products and applications that are generations removed from the “legacy” print applications they have been used to. This white paper, part 2 of 2, explains how new features and functions of printing systems can add value to digital printing, and to printing in general. We also include a look at one digital printer who has leveraged the new features of the Nexpress to help cultivate a growing high-end application-oriented business.

The Story So Far

In Part 1 of this white paper¹, we discussed how digital printing has changed how we think about—and thus produce—printed materials. Today, we speak more and more about “applications,” the specific products that a press, and therefore a print service provider, is capable of producing. The applications that are in demand by the market at any given time change, and for commercial printers, that change happens faster than they’re used to.

We also discussed the difference between “legacy” applications and “high-value” applications, identifying them thusly:

- *“Legacy”*—The type of work that used to comprise printers’ bread-and-butter jobs: standard four-color commercial print work, like direct mail, brochures, marketing collateral materials, etc.
- *High-Value*—Print products that are more creative, more specialized in terms of substrate, have higher quality, integrate some form of personalization or customization, and/or are something “more” than longer, mass-produced commercial print runs.

High-value applications stem from new substrates, new inks, and new finishing processes, as well as enhancements to the front ends that coordinate all these things, that have allowed today’s digital presses, in particular the Kodak NexPress, to produce a growing portfolio of these items. It’s true that in an industry as large as commercial printing, there will still be shops that profitably produce legacy applications, but the *real* action these days is in high-value applications.

Let’s now take a closer look at the NexPress.

Introduction to the NexPress

In 1997, Eastman Kodak and Heidelberg embarked on a joint venture they called NexPress Solutions, whose mission was to build a digital press. The first fruits of that venture, the NexPress 2100, debuted at DRUPA 2000 had a full-scale commercial rollout a year later. The NexPress was well-received by the industry and in 2004, Kodak bought Heidelberg’s digital business, as well as Heidelberg’s 50% interest in NexPress Solutions.

This Year’s Models

The current NexPress platform is the NexPress SX, which comes in three configurations: the SX2700, the SX3300, and the SX3900. The three models differ predominantly in speed (which we will look at below), but all three use as their imaging technology dry electrophotography, and offer a print resolution of 600 x 600 dpi x 256 exposure levels. Each also offers a five-color print engine—CMYK, plus a Fifth Color Unit that can be configured by the user to add a variety of additional colors or effects. At present, the Fifth Color Unit options are:

- Gold Dry Ink, which can add a variety of metallic effects;
- dimensional printing via specialized large-particle, clear dry ink to impart a 3D effect;
- Intelligent Color red, green, or blue dry ink to expand the color gamut;

¹ See <http://whattheythink.com/whitepapers/new-applications-digital-communications.cfm>.

- Intelligent Coating, which can apply a satin coating for durability, a watermark for copy protection, and/or flood or spot glossing;
- Red Fluorescing Dry Ink—basically a type of invisible ink for anti-counterfeiting, bar-code applications, or other such uses;
- magnetic ink character recognition (MICR) ink, for banking applications such as check printing;
- Light Black HD Dry Ink, which helps print smoother skin tones.

In 2015, Kodak will be offering pearlescent inks to add additional metallic effects and further expand the range of high-value applications.

Substrates and Speeds

The NexPress models can handle a variety of substrates, including many types of papers (uncoated, matte coated, glossy coated, cast coated and textured, wood-free and recycled, as well as standard offset papers) and others such as labels (uncoated, matte coated, and glossy coated), paper-backed transparency films, magnetic substrates, photo book paper, synthetic paper, and pre-perforated and scored specialty stocks. Essentially, there are more than 800 compatible substrates.

The NexPress systems offer both four standard feeders and an optional feeder, the latter of which boosts speed and can handle slightly larger paper sizes. For example, the standard feeder handles a maximum sheet size of 14 x 20.47 inches, whilst the optional feeder can go a bit larger to 14 x 36 inches. Substrate thickness can range from 16-lb. bond up to 130-lb. cover.

The three models differ predominantly in speed and, therefore, productivity. The differences are:

Table 1: NexPress Model Speed Comparisons

	top speed—8.5x11/A4/legal pages per minute (ppm) (standard feeder)	top speed—8.5x11/A4/legal pages per minute (ppm) (optional feeder)
SX2700	83 ppm	91 ppm
SX3300	100 ppm	109 ppm
SX3900	120 ppm	131 ppm

Those are the highest rated speeds, but you get the general idea of the productivity of each of the machines.

Front-End Features

The NexPress Platform uses as its front end a highly integrated Kodak controller designed to exploit the unique capabilities of the NexPress, such as the Fifth Color Unit applications, as well as control the press and operator maintenance routines. It's based on the Adobe PDF Print Engine, and supports a number of variable-data printing workflows. Kodak also offers Unified Workflow Solutions that can not only simplify the workflow, but also add complex features like variable-data printing, Web-to-print, and photographic editing services.

Recognizing that many shops have their own workflows already in place, the NexPress systems are compatible, and can be integrated, with many third-party workflows environments.

Print Genius

The NexPress Platform incorporates what Kodak calls Print Genius Technology, which comprises a combination of hardware and software to control quality and consistency throughout a pressrun. Print Genius serves color management functions, features closed-loop calibration, and can match Pantone Plus PMS and Goe colors. It also comprises the Intelligent Calibration System (ICS) to automatically analyze and ensure print uniformity across all five printing units. The NexPress platform also supports JDF, and enhances variable-data printing performance via "enhanced object caching" and the ISO standard PDF/VT.

The Kodak digital front end also utilizes System 15.0, which we will look at in more detail below.

Postpress Features

If you produce direct mail or other types of marketing materials, you know that the challenge is to create printed products that “stand out.” Even though print and mail volumes have been declining for almost two decades now, there is still strong competition in mailboxes. Adding special finishes, coatings, or other types of special effects is a great way to make a piece “pop.” To that end, the NexPress system can offer:

- an ultra-smooth high gloss finish attained via the Kodak NexPress Glossing Unit;
- a textured finish that can be applied as a flood coat or to certain portions of an image (like a spot varnish)—and this can be variable from sheet to sheet;
- a satin coat applied inline to add durability or to add watermarks or other copy-protection;
- a matte finish;
- a spot gloss via clear dry ink.

The NexPress is also compatible with a variety of third-party inline and nearline finishing equipment.

Upgrades and Enhancements

For nearly 15 years, the NexPress has been continuously refined and upgraded, and new solutions and features are constantly being introduced to the market. However, new features are not just limited to new presses and installations; all new features and upgrade options are available for any NexPress system installed since 2006.

Continued Innovation for the NexPress—Enabling High-Value Applications

Some of the top high-value applications that the NexPress supports.

- 6- and 8-page brochures, now digitally produced with the Long Sheet Option
- booklets
- calendars
- greeting cards
- magnets
- MICR
- photo books
- plastic ID cards
- yearbooks

What enables these applications is not just the physical printing capabilities of the press, but the software controlling it. Ask any press operator who has been working with digital equipment for any length of time and he or she will tell you that, unlike offset, it is less about gears and rollers and cylinders and more about software. Much, if not most, of the functionality of digital printing lies in the software that controls the system, and upgrades to and new features of that software can dramatically expand the range of what printers can print, and how well they can print it.

The latest version of the NexPress platform software—System 15.0—offers a number of new features and functionality to help users produce those high-value applications. These are:

Economy Mode

Well-suited for transactional documents and other applications that have less stringent image quality requirements, Economy Mode uses a unique halftone screen designed to let the NexPress use significantly less ink. It offers less color gamut, lower color saturation, and lower dMax, and doesn't offer some of the extra colors available for the Fifth Color Unit, but it does support MICR, Gold, Clear, DMCL, and Red Fluorescing inks. An added bonus of Economy Mode is its ability to match inkjet quality for shorter runs, or for reworking documents that may have been damaged during the original inkjet pressrun. It is also an option for transactional jobs with less than critical color requirements.

Ink Optimization

Well-suited for all types of NexPress jobs, the Ink Optimization function of System 15 functions much like under color removal (UCR) or black replacement, familiar to prepress operators and color retouchers, in that it substitutes black for CMY inks, replacing rich black with true black. While this results in a slightly smaller color gamut, it saves on overall ink usage and cost. And, like most System 15 features is selectable on a job-by-job basis. Ink Optimization is also well-suited for direct mail applications, where maintaining consistency in mastheads, brand colors, standard images, and other elements, from NexPress-to-NexPress and/or run-to-run, is imperative. (See Figure 2 on the next page.)

SmartRGB

Well-suited for photographic applications such as headshots, SmartRGB mode is designed to improve skin tones by removing graininess while at the same time retaining image detail in photos. Essentially, the software uses multiple passes through the image to analyze and apply the appropriate algorithms. This is performed via a simple selection from the operator, and no external file preparation is needed. The drawback, however, is that pages with high photo content can take as much as three times longer to RIP than in regular mode, but the quality tradeoff may make the extra time worth it. Kodak offers a NexPress VII Front End, Ultra Performance with 64 GB of RAM so the press is never waiting for a file. SmartRGB only works on RGB images, not CMYK (hence the name), and doesn't work in Economy Mode, but can be used with all inks and in four and five color modes. (See Figure 3 on the next page.)

Operator Speed Control

The NexPress System 15 allows operators to manually adjust the press speed in those cases where a demanding job may need to be run at a somewhat slower speed—say, 83 pages per minute (ppm) vs. 120 ppm—in order to yield a desired level of quality with difficult substrates such as synthetics.

Other features of the NexPress' System 15 include improved job reporting, counters, and data export options; support for a new Multigraf stacker that can handle 36-inch sheets, and other enhancements.

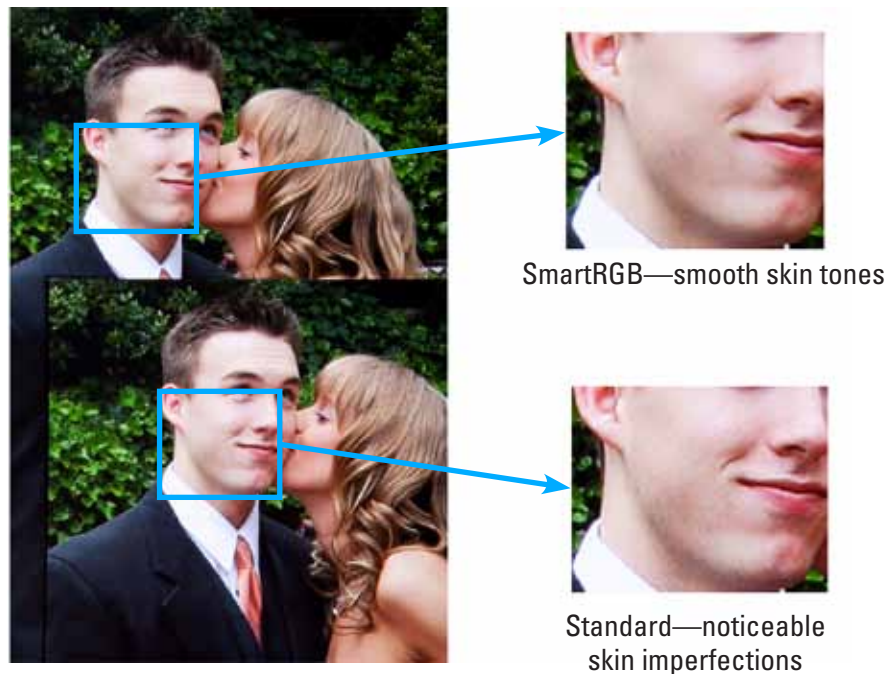
Figure 1: CMYK Mode vs. Economy Mode



Figure 2: System 15 Mode Comparison



Figure 3: Smart RGB Mode



Case Study: Direct Response Imaging



Founded 2005, San Francisco's Direct Response Imaging is a digital printer whose clients include hospitals, schools and other educational institutions, as well as San Francisco's extensive and venerable graphic design community. The company bought its first NexPress in 2005, and today's equipment roster includes the latest version.

"Back in '05, the NexPress was the best answer for our variable-data printing needs," said company president Ian Flynn. At the time, Digital Response Imaging was primarily a direct mail and envelope printer, producing a high volume of four-color variable-print jobs. "A lot of that direct mail business has fallen by the wayside, and we evolved into a short-run premium high-speed printer."

What has replaced that direct mail work is on-demand specialty work of the "high-value application" type. "Stuff that we never even thought we'd do before," said Flynn. "The market probably never even existed for this stuff because it couldn't be done before." Postcards with embedded magnets, "mega-thick" cards and stationery, dimensional printed materials, and more. Their geographic location also gave them access to a new, unique product category for the company.

"We're four blocks from the Moscone Convention Center, so we have developed a niche printing business for badges," said Flynn. One of the badge projects the company worked on recently was for a large consumer products company exhibiting at the convention center. The badges used variable data, while the reverse also featured dimensional printing not only as a design flourish, but also as an anti-counterfeiting agent.

Digital Response Imaging has found that their dimensional printing capabilities have been very popular among its customers. The company recently added the Gold Dry Ink option and the applications it has enabled have taken off like gangbusters. They've been using the gold ink to print invitations, brochures, and a self-promotional postcard campaign created in conjunction with Neenah Paper.

Flynn found that a challenge, and an opportunity, has been in showing customers what can be done. "It's taken some effort to educate customers about what the potential is and what they can do with it," he said, "but once they get samples in their hands they get the hang of it." So Direct Response Imaging does a lot of outreach and self-promotion. To complement the postcard campaign, they are doing an event with Neenah in July at a new San Francisco microbrewery "to showcase the design, the paper, and the gold printing."



The efforts thus far have paid off. "We've definitely picked up some new customers from the gold ink," said Flynn. "Some are designers, and we got a new end-user customer who likes it."

"All these special effects make us different from other printers," he added.

Even more prosaic features of the NexPress, like the support for larger sheet sizes, has given them the ability to take on other types of work, "like oversized pieces that would be very difficult on a competitor's press," said Flynn. And not just larger sheets, but even plastic substrates, such as polyester tags for a client that was dissatisfied with the lack of durability of paper tags. "They've been very happy with that."

So thanks to the capabilities of the NexPress, Direct Response Imaging has been able to build up a sizable, satisfied customer base eager to develop these high-end applications.

Conclusion

The value of digital printing today lies not in replicating offset work on a smaller scale or at a shorter run length. Instead, it lies in developing unique, high-value products and applications. And not just any high-value products and applications, but those that are in demand in a constantly and rapidly changing marketplace. New substrates, new inks, new finishing options, and new ways of ensuring high-quality imagery are having an impact on what is being demanded by the market. At the same time, being able to profitably produce these applications is of paramount importance. The advantage to digital printing—and indeed the advantage to the NexPress—is that it gives print service providers the ability to nimbly handle new and different applications. This allows them to better respond to changes in the market, and thus better serve the needs of customers, be they past, present, or prospective.



This white paper was sponsored by Kodak. For more information about Kodak's NexPress digital press solutions, please visit the Kodak NexPress site at http://graphics.kodak.com/GB/en/Product/Printers_Presses/Comm_sheet/Digital_Color/default.htm.
