

March 10, 2008

Analysis

HP Indigo Announces New Hardware and Software Products for Drupa 2008

Authors

Steve Adoniou

Jim Hamilton

Published by

On Demand Printing &
Publishing consulting service

Abstract

At an analyst briefing in Israel today, HP Indigo made several major announcements about new products that it will show at Drupa 2008. The introductions of the HP Indigo 7000 Digital Press, the HP Indigo W72000 Digital Press, and the HP Indigo WS6000 Digital Press will be the most visible of these announcements since they represent the next generation of Indigo technology with increased speed and productivity. HP also announced a number of improvements for the HP Indigo Press 3500 and 5500. From a software/solutions perspective HP Indigo introduced a new workflow concept called SmartStream that is HP's solution set for a variety of applications and environments. The newest SmartStream products are HP's next generation print server products: the HP SmartStream Production Pro Print Server and the HP SmartStream Production Plus Print Server, Powered by Creo. In addition to the HP Indigo news, HP announced a new product development called the Inkjet Web Press, a thermal inkjet device capable of speeds of 400 linear feet per minute on webs as wide as 30 inches. This analysis covers the new products, their key features, value propositions, target markets, and HP Indigo's strategy heading into Drupa 2008.

For More Information

If you would like to order extra copies of this report, receive permission to use any part of the report, or be informed of upcoming market updates, reports, and related projects, please email us at info@infotrends.com.

© 2008 InfoTrends, Inc.
www.infotrends.com

Headquarters:
97 Libbey Industrial Parkway
Suite 300
Weymouth, MA 02189
United States
+1 781 616 2100
info@infotrends.com

Europe:
3rd Floor, Sceptre House
7-9 Castle Street
Luton, Bedfordshire
United Kingdom, LU1 3AJ
+44 1582 400120
euro.info@infotrends.com

Asia:
Hiroo Office Building
1-3-18 Hiroo, Shibuya-ku
Tokyo 150-0012
Japan
+81 3 5475 2663
info@infotrends.co.jp

Table of Contents

Abstract	1
Introduction	2
The U.S. Production Color Market Share for High-Volume Printers	3
A Look Back at Previous Indigo Technology Announcements.....	4
New HP Indigo Press Products	4
HP Indigo 7000 Digital Press.....	5
HP Indigo WS6000 Digital Press.....	9
HP Indigo W7200 Digital Press	11
Improvements to the HP Indigo Press 3500 and 5500.....	13
Advances for the HP Indigo Press 5500	13
Advances for the HP Indigo Press 3500	14
Comparing the HP Indigo 7000 Digital Press to the HP Indigo Press 5500 and 3500	14
HP Print Servers and PrintLink.....	14
HP SmartStream.....	16
HP SmartStream Print Servers for the HP Indigo 7000 Digital Press	17
HP SmartStream Labels and Packaging Print Server, Powered by EskoArtwork	20
HP Inkjet Web Press	21
Conclusion	21

Introduction

As part of its Drupa 2008 briefing in Israel, HP has announced next-generation Indigo Digital Press products and a new workflow software solution portfolio called HP SmartStream. The new devices are the HP Indigo 7000 Digital Press, HP Indigo W7200 Digital Press, and HP Indigo WS6000 Digital Press¹.

- **HP Indigo 7000 Digital Press:** The HP Indigo 7000 will be the high-end product in the HP Indigo family of cut-sheet commercial products, joining the HP Indigo press 5500 and 3500. Its 120-page-per-minute four-color speed is nearly double the speed of the HP Indigo press 5500.
- **HP Indigo W7200 Digital Press:** The 240-ppm HP Indigo W7200 joins the w3250 as the high-end product in HP Indigo’s roll-fed duplex commercial product family. Together, the HP Indigo 7000 and the HP Indigo W7200 will be known as the 7000 Series.
- **HP Indigo WS6000 Digital Press:** The 100-foot-per-minute HP Indigo WS6000 will be the high-end product in the HP Indigo family of roll-fed simplex industrial products, joining the HP Indigo press ws4500 and ws2000. The HP Indigo WS6000 is referred to by HP Indigo as the 6000 Series.

HP SmartStream includes print server solutions for the Indigo devices, as well as other components provided by HP and a number of software partners to create a range of end-to-end workflow solutions.

¹ The branding is slightly different from earlier products. For the new products the words “Digital Press” are used as part of the product’s name. Another difference is that any letters used with the product numbering are now in capitals. For example, the branding for the new roll-fed duplex commercial product is the HP Indigo W7200 Digital Press. Its predecessor was called the HP Indigo press w3250.

This new set of digital printing hardware and software solutions further reinforces HP's commitment to the printing, publishing, and packaging industries and their various segments.

HP news also included a new product development called the Inkjet Web Press, a thermal inkjet device capable of speeds of 400 linear feet per minute on webs as wide as 30 inches. In addition, HP announced improvements to the HP Indigo press 5500 and 3500.

The U.S. Production Color Market Share for High-Volume Printers

With the introduction of the HP Indigo 7000 Digital Press, all three vendors of 1 million + cut-sheet production color printers (HP, Kodak and Xerox) will now have equipment capable of, or exceeding, 100 pages per minute (ppm). The HP Indigo 7000 Digital Press will print A4 four-color pages at 120 ppm. The first Indigo production color printing device was introduced in 1993 and had a speed of 33 ppm. Not only has the speed of these devices multiplied since then, but improvements in reliability, image quality, substrate handling, productivity, and cost of operation have also progressed significantly since the early days of digital printing.

Looking at the production color digital cut-sheet printer market, HP Indigo has taken a position of leadership in terms of annual unit placements. Consider the 1 million + duty cycle category (see Figure 1 below) in 2006 HP Indigo placed 649 units worldwide, giving them around 47% market share. Preliminary numbers available for 2007 indicate an overall growing market and an improvement in HP Indigo share. Based on these preliminary 2007 figures, HP Indigo placed 757 units of the 1,540 total, increasing their worldwide market share to 49.2%.

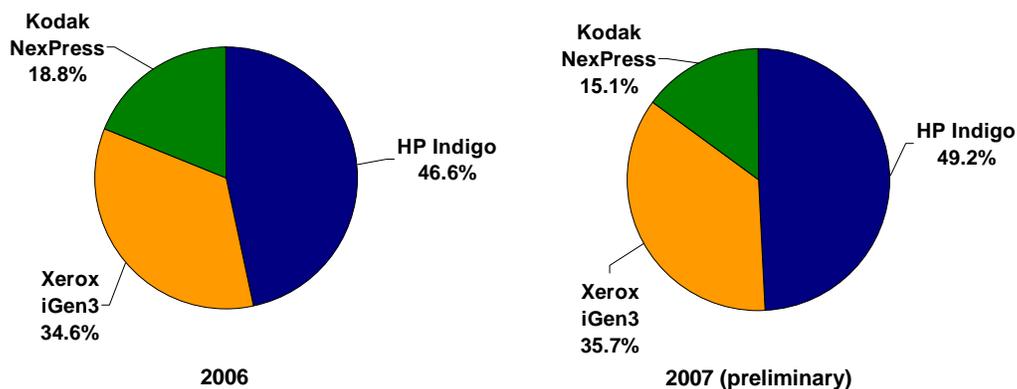


Figure 1: Worldwide Production Color 1 Million + Duty Cycle Cut-Sheet Printer – 2006 and 2007 Market Share

Source: InfoTrends Quarterly Tracking Program

HP Indigo's market share lead extends to the class of production color industrial digital printers, a new and growing area. No published figures are available to date, but HP has a clear market share lead and will likely extend it with the introduction of the HP Indigo WS6000 Digital Press.

HP's position in the web-fed commercial market is as a challenging newcomer. While the HP Indigo w3250 and w3200 have been on the market for quite some time and are in use at some very high volume HP Indigo sites, their placements numbers are not at the levels of other HP Indigo products. The speed and productivity improvements inherent in the HP Indigo W7200 Digital Press will certainly open up new opportunities for HP in this product class.

A Look Back at Previous Indigo Technology Announcements

Some historical background on Indigo's previous technology announcements will help in understanding the overall evolution of the product line.

Table 1: A Comparison of HP Indigo Technology Capabilities Over the Years

Announcement	Description	Product Examples
Mid-1990s	Process speed: 118 feet per minute Imaging method: 4-beam lasers	E-Print 1000 HP Indigo press 1000/1050
Drupa 2000	Process speed: 236 feet per minute Imaging method: 12-beam lasers	HP Indigo press 3000/3050/3500 HP Indigo press 5000/5500 HP Indigo press w3200/w3250
Drupa 2008	Process speed: 423 feet per minute Imaging method: 22-beam lasers	HP Indigo 7000 Digital Press HP Indigo W7200 Digital Press HP Indigo WS6000 Digital Press

The earliest Indigo products, such as the E-Print 1000, used 4-beam lasers and had a process speed of 118 feet per minute. The speed doubled in the next generation of products, like the HP Indigo press 3000 and 5000, in part through an imaging capability that tripled the number of laser beams. With the announcement of HP Indigo's latest products, the process speed has jumped to 423 feet per minute and the imaging capability now uses a 22-beam laser. From generation to generation there have also been ongoing increases in format size, beginning with 308 x 437 millimeters and increasing to 317 x 464 millimeters with the new cut-sheet product introductions. Over all generations of its technology HP reports that it has an installed base of more than 4,000 active HP Indigo products.

New HP Indigo Press Products

The new HP Indigo press products represent HP Indigo's next generation printing platform. The most significant improvements for these products are dramatic printing speed increases, increased image area, and other productivity improvements. The HP Indigo 7000 Digital Press will print at a color speed of 120 pages per minute (ppm) and a monochrome speed of 240 ppm. This cut-sheet device will sit above the HP Indigo 5500 in the product line and will have approximately 75% faster color printing speed. The HP Indigo WS6000 Digital Press, which is the next generation industrial, continuous feed color device, will print at 30 meters per minute – twice the current color speed of the existing HP Indigo press ws4500. The HP Indigo W7200 Digital Press is a double-engine commercial web printing device, similar to the w3250, though much faster. The W7200 can print process color at 240 ppm and monochrome pages at up to 960 ppm.

Common to all these new devices are the following enhancements:

- Significantly faster printing speeds
- Third generation print engine technology

- More aggressive click pricing plans in order to reduce total cost of ownership (TCO) – HP has re-worked its pricing plans to make printing more economical as well as to reward those customers who drive higher volumes. HP has not yet provided detail on the pricing plans but will do so as the products roll out.
- Integration with the HP SmartStream software portfolio
- A new software protocol named PrintLink, which provides fast bi-directional data transfer between the external print server and the HP Indigo. PrintLink improves HP's ability to integrate print MIS data from its print engines using this bi-directional communication.
- A touch screen operator panel
- New long-life consumables
- The improved oil recycling system that was first announced for the HP Indigo press 5500
- HP Indigo's PrintCare uptime improvement package²

One key attribute of the new HP Indigo 7000, W7200, and W6000 is that they do not have an integrated onboard print server, as was the case with earlier Indigo products. For these earlier products, users were able to add an external print server, but did not have to. For the new products users must select an external print server. The removal of the onboard print server has important workflow and productivity implications for the new products (full discussion to follow).

HP Indigo 7000 Digital Press

A key enhancement to the HP Indigo Press 7000 Digital Press is the faster printing speed of 120 ppm. This improvement has addressed the primary weakness of the Indigo 3500 and 5500 devices. In addition to being able to print up to 120 ppm in color, the HP Indigo 7000 Digital Press will also be able to print up to 240 ppm in monochrome or two-color mode, and will have a duty cycle of more than 3.5 million four-color A4/letter impressions per month. A choice of three external print servers will be available. It supports Pantone emulation with four, six, or seven colors including Pantone Goe. The HP Indigo Ink Mixing System allows users to match up to 97% of Pantone colors. A Job Definition Format (JDF) architecture simplifies integration into print management information systems (print MIS) as well as JDF-enabled workflows.

HP reports that 90% of the components of the HP Indigo 7000 Digital Press are new. These include:

- **New charging roller:** An easy-to-handle charging roller replaces coronas.
- **High-speed consumables:** Consumables, including BID, PIP,³ blanket, and ElectroInk have been adapted for higher speed operation.
- **High-speed capability:** High-speed paper handling has been facilitated in part by changing all motors to servos.
- **Larger ink cans:** The ink cans are three-times the size of previous products.

² PrintCare will be implemented for the HP Indigo press 5500 press in 2009.

³ BID stands for binary ink development. PIP stands for photo imaging plate.

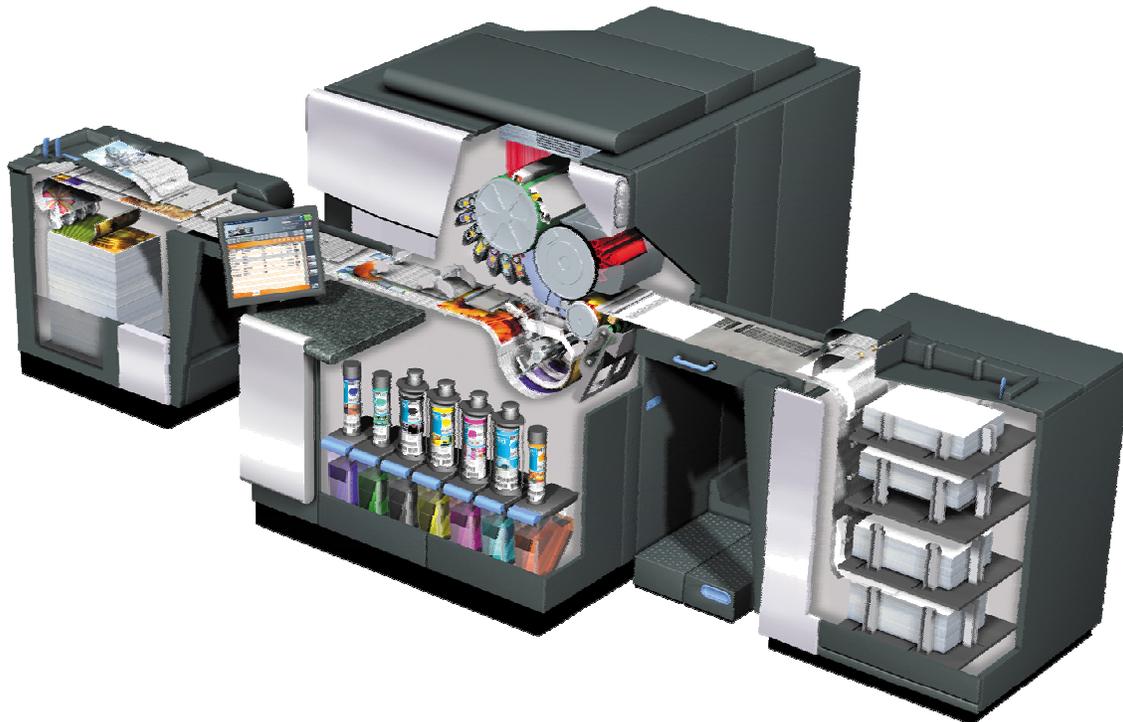
- **High-speed writing head:** The 812 dot-per-inch, 8 bit-per-pixel writing head is capable of speeds of 775 megapixels per second. HP believes this may be the fastest in the industry.
- **High-speed offsetting mechanism:** A new double-diameter blanket drum has external heating and quick mounting features. HP points out that this method is superior to the previous generation's internal blanket heating feature and will allow printing on a wider range of uncoated, lower grade papers as part of a technology that HP calls Automated Substrate Adaptive Process Parameters.

Figure 2: The HP Indigo 7000 Digital Press



Source: HP

Figure 3: Schematic of HP Indigo 7000 Digital Press



Source: HP

Another important feature of the HP Indigo 7000 Digital Press is the increased image area of 12.48” x 18.26”, up from 12.48” x 17.7”. This image area enables production of such applications as 6” x 9” postcards and books 4-up on a full-size (13” x 19”) sheet, standard business cards at up to 24-up on a full size sheet, and book covers for 8.5” x 11” perfect bound books with spine widths up to 1.135”.

Other improvements to the HP Indigo 7000 Digital Press include a new touch-screen interface, automation of many operator tasks, faster system start-up, and On-press Fast Ink Replacement (OFIR) technology. OFIR, which was announced with the 5500, allows on-the-fly replacement of special and spot colors. Previously, the device could not run process color jobs while the color was being changed on the fifth, sixth, or seventh imaging station.

Table 2: Key Specifications of the HP Indigo 7000 Digital Press

	HP Indigo 7000 Digital Press Specification
Print speed (two-up)	120 four-color letter-size images per minute 240 monochrome or two-color letter-size images per minute
Print resolution	812 and 1,219 dot per inch at 8 bits per pixel 2,438 x 2,438 addressability with High Definition Imaging (HDI)
Halftone screens	144, 175, 180, and 230 lines per inch
Maximum paper size	13” x 19”
Print size (maximum)	12.48” x 18.26” (317 x 464 mm)
Supported papers	Coated: 55 lb. text to 130 lb. cover (80 to 350 gsm) Uncoated: 40 lb. text to 120 lb. cover (60 to 320 gsm) Thickness from 70 to 400 microns (3 to 16 point)
Paper input	Four trays: Normal drawers: 3 x 1,800, 80 lb. text sheet capacity Special jobs drawer: 1 x 700, 80 lb. text sheets capacity
Paper output	Auto duplex/auto perfecting feature is standard 6,000, 80 lb. text sheets output capacity 1 stacker (600 mm stack height) Supports jog offset stacking. High capacity proof tray (60 mm height)
Feeding and stacking options	1 additional feeding module with three drawers, each capable of handling 1,800 sheets of 80 lb. text ⁴ 1 additional stacking model, capable of handling 6,000 80 lb text sheets
Power consumption	An average of 18 kilowatts during printing

The HP Indigo 7000 Digital Press will be available at Drupa 2008.

⁴ Standard paper input capacity, including all four drawers, is 6,100 sheets. With the optional three-drawer feeding module (which handles 5,400 sheets), the total capacity is 11,500 sheets using all seven drawers. These amounts are based on the assumption of an 80 lb. text stock.

Further Improvements to Productivity

Along with the significant increase in printing speed and a larger image area, the new HP Indigo 7000 Digital Press offers gains in productivity and uptime through a toolset called “HP Indigo Print Care.” This includes:

- Guided troubleshooting
- On-press and remote diagnostics
- A webcam that enables clear communication with remote support personnel
- HP Instant Support desktop sharing
- Preventive diagnostics
- A feature called CallMe@HP that submits a request to be contacted by an HP call center
- A “machine at a glance” feature that provides a status summary at the click of a mouse

Note: These features are also part of the HP Indigo W7200 Digital Press and the HP Indigo W6000 Digital Press.

Table 3: HP Indigo 7000 and 5500 Comparison Chart

	HP Indigo 7000 Digital Press	HP Indigo press 5500	Advantage
Four-color print speed	120 A4/letter, 4/0 impressions per minute	68 A4/letter, 4/0 impressions per minute	76.5% increase in color print speed, significant productivity increase
Monochrome and two-color print speed	240 A4/letter, monochrome or two-color impressions per minute	272 A4/letter, monochrome or 136 two-color impressions per minute	76.5% increase in two-color print speed
Print size (maximum)	12.48" x 18.26" (317 x 464 mm)	12.48" x 17.7" (317 x 450 mm)	Maximum print size has increased in length by 3.1%

With this improved productivity and performance, as well as the major increase in printing speed, the HP Indigo 7000 Digital Press offers print service providers with a high-volume, high-quality, high-speed digital cut-sheet printing device. HP is targeting the 7000 at customers who require high quality combined with volume capability higher than what was previously available. Key to this upgrade is the assurance that customers will not sacrifice quality to gain the higher speed and productivity.

Three other benefits, which also apply to the HP Indigo W7200 and W6000, include:

- **My HP Indigo:** A secure on-line community portal containing training and development tools. See www.hp.com/go/myhpindigoweb.
- **The Digital Solutions Cooperative (Dscoop):** A user forum for HP Indigo owners and others for the purpose of sharing information. See www.dscoop.org.
- **HP Indigo Capture:** HP Indigo Capture provides business development tools, training, and marketing programs. See www.hp.com/go/capture.

HP Indigo WS6000 Digital Press

Like the HP Indigo 7000 Digital Press, the HP Indigo WS6000 Digital Press will also be capable of faster printing speeds than its predecessor, the HP Indigo press ws4500. The HP Indigo WS6000 Digital Press will print labels and packaging on label stock, film, and folding cartons at up to 100 feet per minute (30 meters per minute), approximately twice as fast as the ws4500. In addition to the improved productivity that the new print engine will enable, the WS6000 will also feature a significant increase in image area from the 12.1” x 17.7” of the ws4500, to the 12.5” x 38.6” of the WS6000, more than doubling the maximum length of the ws4500 image area. This is accomplished through a double-diameter blanket drum. The blanket drum was half the size of the imaging drum in previous devices; they are now the same size. This means that WS6000 users can print a seamless image 38.6 inches long. The larger repeat length of the WS6000 allows for expanded impositions accommodating more images.

Figure 4: The HP Indigo WS6000 Digital Press



Source: HP

Table 4: Key Specifications of the HP Indigo WS6000 Digital Press

	HP Indigo 7000 Digital Press Specification
Print speed	30 meters per minute (four-color) 60 meters per minute (one- or two-color)
Print resolution	812 and 1,200 dot per inch at 8 bits per pixel 2,400 x 2,400 addressability with High Definition Imaging (HDI)
Halftone screens	175 lines per inch
Print size (maximum)	12.48” x 38.58” (317 x 980 mm)
Web width	Maximum: 13.38” (340 mm) Minimum: 7.87” (200 mm)
Supported substrates	Self-adhesive label stock, films, and folding cartons 12-450 microns (0.47-17.6 mils)
Other	Supports white ElectroInk and up to seven colors

Figure 5: Schematic of HP Indigo WS 6000



Source: HP

Other important improvements made to the HP Indigo WS6000 Digital Press are the following:

- A new high-speed, low-noise, servo-driven web handling system
- A one-shot process, in which color separations accumulate on the blanket before transfer to the substrate
- An improved white ElectroInk
- A larger range of supported medias for applications requiring substrate thicknesses from 12 to 450 microns
- An EskoArtwork print server solution designed specifically for the production of labels and packaging; the version for the WS6000 implements PrintLink
- A new touch screen interface designed for industrial environments

Table 5: HP Indigo WS6000 and ws4500 Comparison Chart

	HP Indigo WS6000 Digital Press	HP Indigo press ws4500	Advantage
Four-color print speed	100 fpm 30 mpm	52.5 fpm	Nearly doubles the printing speed
Media thickness	12-450 microns (0.47-17.6 mils)	12-350 microns	Ability to run thicker card stock offers additional opportunity to produce wider range of applications
Repeat length	317 x 980 mm	308 x 450 mm	Significantly improves application flexibility to fit more images or to run larger images

The increased repeat length, while allowing larger impositions, also opens up other applications, for example, book dust jackets, which are typically printed simplex and often have format requirements beyond many cut-sheet devices. Another key value proposition for the WS6000 is the higher cross-over point with traditional label and package printing applications such as flexographic presses. HP says that the ws4500 has a cross-over point of approximately 2,000 meters with traditional processes. With the speed and productivity improvements, HP now says that the cross-over point of the WS6000 is a much higher 4,000 meters. The HP Indigo WS6000 Digital Press will not replace the ws4500. Due to its anticipated higher price and more robust features, this device will be positioned for higher volume establishments who can justify the purchase of such a device for their initial digital production device, as well as offer a migration path for current ws4500/4050/4000 users that seek to grow their volumes. HP expects that the speed, cost, and productivity improvements inherent in the WS6000 will expand the run length capability for this class of devices. Typically, the runs have been less than 1,000 meters, but HP indicates that the runs will likely shift much higher, into the 1,500-3,000 range.

The HP Indigo WS6000 Digital Press will be shown at Drupa 2008 where HP will be conducting technology demonstrations of the product. Beta sites will begin during the second half of 2008, and HP expects that the product will begin shipping in the first half of 2009.

Other HP Indigo Industrial Products

In addition to the HP Indigo WS6000 and ws4500/4050/4000, other HP Indigo industrial products include:

- **HP Indigo press ws2000:** The ws2000 is a web-fed device for label and card printing applications such as business cards, credit card covers, forms, mousepads, overlays, photo ID cards, point of sale displays, product collateral, screens, security printing, and statements.
- **HP Indigo press s2000:** The s2000 is a sheet-fed device for printing graphic attachments and overlays for applications like membrane switches, panels, keypads, and mousepads. It also handles plastic identity cards for driver's licenses and financial applications. Like the WS6000, the s2000 uses HP's one-shot imaging process. It is the only HP sheet-fed device to do so.

HP Indigo W7200 Digital Press

Similar to the HP Indigo 7000 and the WS6000, the HP Indigo W7200 Digital Press will be capable of much higher printing speeds than its predecessor, the HP Indigo press w3250/w3200. The HP Indigo W7200 Digital Press will have a top speed of 240 A4/letter images-per-minute (ipm) for 4-color duplex printing, 480 ppm for 2-color duplex, and 960 ppm for monochrome duplex. The advantage of a two-engine web-fed device is that the printing does not slow down for duplex. Compared to the HP Indigo w3250, the HP Indigo W7200 not only has faster printing speeds, but also a higher daily volume capacity of 7.5 million four-color images (or 28 million monochrome images).

Figure 6: The HP Indigo W7200 Digital Press (from left to right: rewinder, second print engine, buffer & turnbar, first print engine, in-line priming unit, unwinder)



Source: HP

Also along the lines of the HP Indigo 7000 and the HP Indigo WS6000, the HP Indigo W7200 will offer improvements in productivity, while maintaining the image quality of all the HP Indigo products. The HP Indigo W7200 Digital Press will join the HP Indigo press w3250 in the product line when it enters the market towards the end of 2009.

Figure 7: Schematic of the HP Indigo W7200 Digital Press



Source: HP

Indigo first demonstrated a multiple-engine design at Drupa 2000. This design developed into the HP Indigo press w3250, which HP reports is in use at six of HP Indigo's top ten customers printing applications like books, flight manuals, direct mail, and credit card statements. HP is positioning the W7200 as an application-focused, high-volume device with offset quality for applications such as on-demand and short-run books, journals, manuals, magazines, personalized direct mail campaigns, and trans-promotional statements.

New features and enhancements to the HP Indigo W7200 print server include:

- Load balancing in multi-engine environments – A single variable data print stream is automatically balanced across raster image processors (RIPs) and print engines
- Scalable – RIPPING power and storage can be added
- 24/7 reliability to improve redundancy

HP is planning to add support for AFP/IPDS, but it will not be available in 2008.

Table 6: HP Indigo W7200 and w3250 Comparison Chart

	HP Indigo W7200 Digital Press	HP Indigo press w3250	Advantage
Print Speed	240 ppm four-color 960 ppm monochrome	136 ppm four-color 272 ppm monochrome	80% increase in four-color print speed 260% increase in monochrome print speed
Substrate Range	40-350 gsm Coated and uncoated	40-300 gsm Coated and uncoated	Ability to run thicker card stock offers additional opportunity to produce a wider range of applications
Image Area	11.9" x 37.4"	11.9" x 17.7"	Increased length in image area enables broader range of applications as well as imposition capabilities

One of the key enhancements of the HP Indigo w3250 from the HP Indigo w3200 was its inline paper conditioning module. This was a significant improvement which increased the range of substrates that the HP Indigo w3250 could handle. The W7200 will also have this module. The current list price for the HP Indigo press w3250 is approximately \$850,000. HP has not released pricing but InfoTrends estimates that the list price for the HP Indigo W7200 Digital Press will be over \$1 million.

Improvements to the HP Indigo Press 3500 and 5500

HP also announced a number of improvements for the HP Indigo Press 3500 and 5500.

Advances for the HP Indigo Press 5500

Improvements for the HP Indigo Press 5500 include:

- An additional paper feeding unit that supports up to seven substrate types
- Extended thick substrate support up to 18 point stock (450 microns), which will allow broader capability of producing applications such as tags and folding cartons, which could be done cost-effectively in short runs and with variable data personalization
- Extended selection of eco-friendly substrates including FSC⁵ and recycled substrates from HP Indigo's media partners (these are available to the full range of HP Indigo Digital Press products)
- The addition of an in-line connection to a UV coater that will allow simplex coating for such high-volume applications as photo merchandise, direct mail, business cards, book covers & jackets, and folding cartons
- New EskoArtwork-enabled prepress and finishing options for folding carton applications that provide support for 3D packaging design and simulation, step-and-repeat, and die cut finishing table features
- Extendable HP SmartStream workflow capabilities that enable press status and control and also allow workflow integration to HP SmartStream products and partners

All of the new capabilities for the HP Indigo Press 5500 will be backwards compatible and will be offered as upgradeable options to the HP Indigo 5500 installed base. The enhanced HP Indigo 5500 will be commercially available during the fourth quarter of 2008.

⁵ FSC stands for the Forest Stewardship Council. The FSC helps users of forest products such as paper to identify whether those products have been harvested in an ecologically responsible manner.

Advances for the HP Indigo Press 3500

The HP Indigo 3500 will have connectivity to HP Indigo Production Manager and the next generation of HP SmartStream print servers. Additional enhancements to the HP Indigo 3500 will be offset-jogging capability in the high capacity stacker and the ability to load and unload media in the drawers while the device is running. These features will be available as upgradeable options to the HP Indigo 3500 installed base. Like the 5500, the 3500 will benefit from HP SmartStream workflow products and partners as well as the extended range of eco-friendly substrates.

Comparing the HP Indigo 7000 Digital Press to the HP Indigo Press 5500 and 3500

With the addition of the HP Indigo 7000 Digital Press, the product line now includes the 3500, the 5500, and the 7000. These are differentiated by speed and format as shown in the table below

Table 7: Speed and Format Comparison for the HP Indigo 7000/5500/3500

	HP Indigo 7000 Digital Press	HP Indigo press 5500	HP Indigo press 3500
Color print speed	120 A4/letter ipm	68 A4/letter ipm	68 A4/letter ipm
Two-color print speed	240 A4/letter ipm	136 A4/letter ipm	136 A4/letter ipm
Monochrome print speed	240 A4/letter ipm	272 A4/letter ipm	136 A4/letter ipm
Print size (maximum)	12.48" x 18.26" (317 x 464 mm)	12.48" x 17.7" (317 x 450 mm)	12.1" x 17.1"
Print volume range (A4/letter pages per month)	More than one million	300,000 to one million	Up to 300,000

Another differentiator of the HP Indigo 7000 Digital Press is that it requires 25% less electricity per printed page than the HP Indigo press 5500.

HP Print Servers and PrintLink

There are four print servers for the new HP Indigo devices:

- HP SmartStream Production Pro Print Server
- HP SmartStream Production Plus Print Server, Powered by Creo
- HP SmartStream Ultra Print Server
- HP SmartStream Labels and Packaging Print Server, Powered by EskoArtwork

Not all of these print servers support all of the new devices. The specific device support is shown below.

Table 8: HP Indigo Print Servers and the Products Supported

	HP Indigo 7000 Digital Press	HP Indigo W7200 Digital Press	HP Indigo W6000 Digital Press
HP SmartStream Production Pro Print Server	Supported	Supported	
HP SmartStream Production Plus Print Server, Powered by Creo	Supported		
HP SmartStream Ultra Print Server	Supported	Supported	
HP SmartStream Labels and Packaging Print Server, Powered by EskoArtwork			Supported

For the new 7000 and 6000 Series devices, each of these servers uses (or will use) a new HP software protocol called PrintLink. PrintLink is the bi-directional protocol between the HP Indigo device and the print server. The two most significant advantages of PrintLink are that it supports higher speed data transfer and it provides an open interface for other digital front end system vendors to connect to Indigo devices. It also provides a bi-directional JDF-enabled link for transfer of data to and from print MIS systems. The most immediate advantage for HP Indigo customers is the facilitation of high-volume data transfer through the network. Once a job is RIPPed, it becomes available to the device. Print jobs are no longer stored on the HP Indigo; the data is streamed in real-time.

This technology was developed by HP to accommodate for its new higher speed 7000 and 6000 Series devices, which require high-speed data transfer. For earlier devices, there will still be an onboard print server and optional external print server. However, all 7000 and 6000 Series devices will not have the onboard print server. Instead, they will come equipped with a required external print server as part of a standard configuration. PrintLink will be available initially for the HP Indigo 7000 Digital Press, but will eventually be rolled out for the other new devices.

This technological change separates the role of the press operator and the print server operator. The print server controls prepress functions. Press operation is the job of the press operator. PrintLink offers the option to have prepress functionality at the device, or moved further upstream to a prepress department. Especially in a multiple device environment, this becomes particularly important. This scenario mirrors what commonly takes place in a traditional commercial offset printing environment, where the prepress department is generally separated from the press room, and the press operators are focused primarily on press operation and do not usually perform prepress duties. Considering that many Indigo devices are installed in such environments, this workflow is very appropriate. For those customers that wish to maintain their current workflow, they may continue in that mode.

HP SmartStream

HP SmartStream is the new brand of workflow solutions for the HP Indigo family of products. This portfolio of digital printing workflow solutions was created in order to meet the requirements of the wide range of market segments and application needs of HP Indigo customers. Included in the SmartStream portfolio are print servers, variable data software, imposition tools, and web-to-print components. Future additions to HP SmartStream will offer workflow components for other HP Graphic Arts businesses, including HP Scitex, HP Designjet, and the new HP Inkjet High-Speed Production division.

HP SmartStream is designed to be scaleable in the sense that it will offer HP Graphic Arts customers the ability to enter into new markets including general commercial printing, direct marketing, publications printing, photo merchandise, labels, and packaging. The HP SmartStream portfolio is made up of HP and partner components that together, provide workflow management from job creation to fulfillment. Table 9 below shows a brief description of each of the HP SmartStream Components.

Table 9: Description of HP SmartStream Components⁶

SmartStream Component	Function
<i>Print Server Family (print servers)</i>	
HP SmartStream Onboard Print Server	An on-press integrated RIP ⁷
HP SmartStream Production Pro Print Server	An automated, production-oriented, scaleable print server solution for managing high print volumes as well as complex variable data jobs
HP SmartStream Production Plus Print Server, Powered by Creo	A high-performance, high-end print server with a Creo Color Server feature set and a scaleable architecture.
HP SmartStream Ultra Print Server ⁸	A high-performance automated workflow and RIP solution for high-volume, image-rich production for the photo merchandise and book market segments
HP SmartStream Labels and Packaging Print Server, Powered By EskoArtwork ⁹	A RIP and hardware solution for automated production of short runs and high performance color management for label and packaging workflows
<i>Other Portfolio Components</i>	
HP SmartStream Designer	Plug-ins for Adobe InDesign and QuarkXPress that allow creation of full-color personalized applications
HP SmartStream Photo Enhancement Server	A scaleable solution for image sharpening, smoothing, contrast improvement, red-eye removal, and shadow enhancement
HP SmartStream Labels and Packaging Security Manager	A secure variable data job creation, prepress, and database management tool providing regulatory compliance (for example, for the pharmaceutical market) for supply chain management and brand value protection for the label and packaging market

⁶ See Figure 8 for HP partners providing SmartStream components.

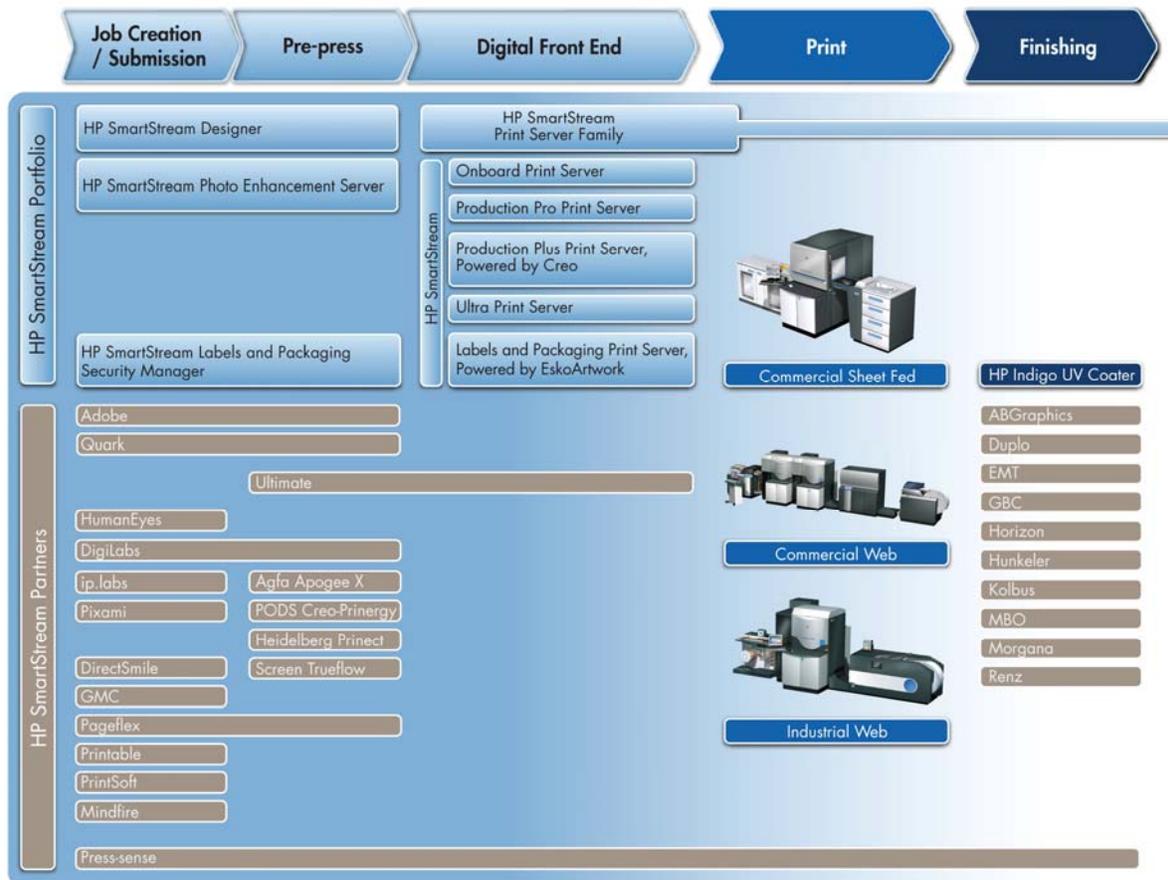
⁷ The Onboard Print Server is built into HP Indigo's commercial sheet-fed products prior to the 7000 Series

⁸ The HP SmartStream Ultra Print Server was formerly known as SRS or Scaleable RIP Solution.

⁹ There are two versions of the HP SmartStream Labels and Packaging Print Server. One is for the ws4000, ws4070, and ws4500, and one is for the new WS6000.

HP sees SmartStream as the key to providing solutions for a variety of areas, including general commercial printers using digital print; hybrid environments using a combination of digital and conventional printing; photo merchandise environments; book, manual, and journal printers; and direct mailers and marketers.

Figure 8: HP SmartStream Workflow Portfolio



Source: HP

HP SmartStream Print Servers for the HP Indigo 7000 Digital Press

The HP Indigo 7000 Digital Press has three print servers that can drive it: the HP SmartStream Production Pro Print Server, the HP SmartStream Production Plus Print Server, Powered by Creo, and the HP SmartStream Ultra Print Server. The print server is an essential component of the new HP Indigo 7000 Digital Press, since the 7000 does not include an on-board controller as previous generations did. The HP SmartStream Production Pro Print Server and the HP SmartStream Production Plus Print Server, Powered by Creo are described below.

HP SmartStream Production Pro Print Server

The HP SmartStream Production Pro Print Server is an entirely new product that HP has engineered with high performance, automation, flexibility, and high color quality as design targets. It is the next generation print server and IT solution for high-volume environments, including those with multiple HP Indigo Digital Presses. HP highlights Production Pro’s strengths including production management and

job queuing, a highly automated workflow via load balancing of RIPping and printing, a scaleable architecture, and a variable data framework designed for high productivity.

The HP SmartStream Production Pro Print Server will replace the HP Indigo Production Manager. The HP SmartStream Production Pro Print Server can be used with the HP Indigo 7000 Digital Press, HP Indigo press 5500/5000/3500, HP Indigo press W7200/w3250/w3200, HP Indigo press 3000/3050, and UltraStream.¹⁰ The Production Pro server can support up to twelve previous generation products or up to six of the new 7000 Series devices.

One key feature of the HP SmartStream Production Pro Server is that it provides prepress functionality that is separate from the print engine. This is enabled through PrintLink, which offers HP Indigo workflows the option to either have prepress functionality at the device or moved further upstream in a prepress department. The HP SmartStream Production Pro also provides management abilities such as centralized resource management (for jobs, fonts, imposition templates, and other assets) for better control of production. To further automate production in high volume environments, Production Pro provides auto load balancing abilities, which balances jobs between RIPs and HP Indigo Presses to achieve the highest utilization rates. The Production Pro's architecture is modular, allowing customers to start with a base configuration, and add control for multiple devices, RIPping power, or storage as needed. Three different HP SmartStream Production Pro Print Server configurations will be offered: IN050, IN100, and IN200. IN050 is targeted at existing HP Indigo devices and smaller production sites. The IN100 and IN200 are targeted at larger sites with higher scalability requirements.

Listed below are four critical modular components of the HP SmartStream Production Pro Print Server that enable it to work efficiently in high-volume complex production environments:

- **Incoming Storage Unit:** Where pre-RIPped files are copied onto hot folders in the storage area.
- **System Manager:** Where jobs are routed to RIPs and printing devices. Jobs can also be split and sent to multiple RIPs.
- **RIP Machine:** Where jobs are RIPped and sent to the press controller or directly to the HP Indigo Digital Press.
- **Press Controller:** Where jobs are stored. The press controller is part of the print server. This component also communicates directly to the printing device and prints jobs as well as managing variable data job processing. It is important to note that this new technology significantly speeds up the flow of files for 7000 Series devices in that it provides files to the press in real time (sheet by sheet) and removes the need to transfer large files to the device's on-board print queue.

Table 10 shows the workflow for the 7000 and 6000 Series and compares it to the workflow possibilities for previous HP Indigo products.

¹⁰ UltraStream was the Indigo predecessor of the product that is now known as the HP Indigo press 3000.

Table 10: Comparing HP Indigo Workflow Types

Product Generation	Workflow Description
Previous products	Two workflow possibilities: <ol style="list-style-type: none"> 1. Onboard print server: The operator controls the device using the onboard print server 2. External print server
7000 and 6000 Series	No Onboard Print Server Customer must select from a choice of external print servers PrintLink, as implemented in the print server, provides bi-directional communication The HP Indigo operator retains control of print functions via a touch screen, but prepress functions are handled at the print server, which can reside in the room with the HP Indigo or elsewhere, if so desired

With a substantial HP Indigo user base of Production Manager, HP will provide customers the ability to migrate currently installed sites to the Production Pro's new software functionality. It is important to note, however, that the migration will not allow these existing customers to connect Production Manager to the HP Indigo 7000 Digital Press.

HP SmartStream Production Plus Print Server, Powered by Creo

The next generation of the Creo print server for HP Indigo will be called HP SmartStream Production Plus Print Server, Powered by Creo. It is a scaleable RIP system solution providing a single point of control in commercial printing environments. It replaces the Production Stream server. The Production Plus Print Server can be used with the HP Indigo 7000 Digital Press, HP Indigo presses 5500, 5000, 3500, 3050, 3000, 1050, 1000, and UltraStream. It is a scaleable solution that is targeted at the workflow needs of commercial printers and allows HP Indigo users to handle a range of applications, large digital production volumes, integration with hybrid workflows, variable data printing, and photo merchandise.

The HP SmartStream Production Plus Print Server is similar to the Production Pro in that it will be able to support multiple devices¹¹ and will be delivered in a rack-mount system. The rack-mount option allows users to add additional print servers as needed. It will be available in the August 2008 timeframe. The base version for operation of one device comes as a tower configuration. This configuration is similar to the Production Pro in that it handles prepress functionality away from the printing device and allows the operator to focus on running the device. Three different HP SmartStream Production Plus Print Server versions will be offered:

- **IN100:** Supports the HP Indigo 7000 Digital Press. It will be available in August 2008.
- **IN040:** Supports previous generation HP Indigo devices and will be available in May 2008. It will support one previous generation device.
- **IN080:** Supports previous generation HP Indigo devices and will be available in May 2008. It will support up to two previous generation devices simultaneously.

The IN040, IN080, and IN100 share the same computing platform, HP's ProLiant ML350 server. This allows them to be assembled into a separately-purchased pre-wired rack-mount configuration. Using the rack-mount, customers can add production capability as needed.

¹¹ It will support up to twelve previous generation products or up to six of the new 7000 Series devices.

HP SmartStream Ultra Print Server

The HP SmartStream Ultra Print Server is built for extremely high job volumes and very large multiple device HP Indigo environments that operate using highly automated workflows. HP highlights Ultra's strengths including extreme scalability, high performance, and automated workflows via load balancing of RIPping and printing. The HP SmartStream Ultra Print Server is based on HP Indigo Scaleable RIP Solution technology, and replaces it. The Ultra Print Server can be used with the HP Indigo 7000 Digital Press, the HP Indigo press 5500/5000, the HP Indigo W7200 Digital Press, the HP Indigo press w3250/w3200, and the HP Indigo press 3000/3050.

HP SmartStream Labels and Packaging Print Server, Powered by EskoArtwork

For the label and packaging markets, HP offers the SmartStream Labels and Packaging Print Server, Powered by EskoArtwork. There are two print servers supporting HP's industrial label and packaging product family. One is for the ws4xx0 Series and one is for the new WS6000. Both of these print servers offer the dedicated production printing tools described below:

- **HP SmartStream Labels and Packaging Print Server, powered by EskoArtwork:** This is a print server that supports PDF 1.6 workflows, reduces the time needed to prepare files for raster image processing (RIPping), and enables on-screen soft proofing, ICC color management, and Pantone certified conversion tables for four-, six-, and seven-color printing. The server also gives operators the ability to reduce waste by creating repeat-length settings in prepress. It also allows "double-hit" separations for more effective use of white ink and has options for high-definition or standard screening. The print server for the WS6000 adds bi-directional connectivity that enables web-to-print and MIS connectivity and also offers more press control from the prepress area. It is also suited to the higher volume requirements of the WS6000. The servers for the ws4xx0 Series and the WS6000 connect to workflow systems offered by EskoArtwork.
- **HP SmartStream Labels and Packaging Color Kit:** This is a high-end color management solution that gives users the ability to match Pantone colors for flexography, offset, or other print methods. This tool, which incorporates EskoArtwork's Kaleidoscope software, also enables spectral profiling of special colors and individually stores them in a database for consistent quality and repeatability.
- **HP SmartStream Labels and Packaging VDP Tools:** This is a set of Adobe Illustrator plug-ins that are offered as a package or as stand-alone modules that enable variable data, barcode, and step & repeat work in digital printing environments.

HP Inkjet Web Press

Another HP announcement has implications regarding the high-volume color printing market. When HP acquired Exstream in January of 2008, one immediate question was “How would HP products meet the needs of the type of high-volume print customers that use Exstream’s enterprise document automation software?” The increased speed and productivity of the HP Indigo 7000 and W7200 provide one answer to that, but with an announcement today from a new HP division called IHPS (Inkjet High-Speed Production Solutions) it is clear that HP will have additional offerings beyond HP Indigo to target high volume color printing.

IHPS will show a new product development called the Inkjet Web Press at Drupa 2008. The Inkjet Web Press is a thermal inkjet printer capable of speeds of 400 linear feet per minute on webs as wide as 30 inches (29-inch print width). Based on a three-up duplex imposition, the Inkjet Web Press can print up to 2,600 letter-sized four-color images per minute at 600 x 600 dpi resolution. Using HP’s scaleable print technology, the device takes advantage of the 4.25-inch inkjet heads used in multiple HP products, including HP’s CM8050 and CM8060 Edgeline products (which began shipping in 2007), and the PhotoSmart Express Photo Kiosk, which is an unattended retail photo kiosk that entered the market in 2006. HP’s ability to effectively stitch multiple inkjet heads together is one advantage that it sees of the scaleable print technology used for the Inkjet Web Press. HP intends to leverage its scaleable print technology across a broad product portfolio.

The thermal inkjet head not only lays down the colors, but also lays down a substance that acts as a bonding agent to provide high quality, image permanence, and more efficient ink usage. The inks are pigment-based and suitable for printing on uncoated stocks and newsprint. HP’s intent with the Inkjet Web Press is to provide full color quality at the best digital print economics. Application areas targeted for the HP Inkjet Web Press include books, direct mail, transaction documents, and newsprint applications. The device will use the SmartStream Ultra Print Server as part of a unified approach to print servers and workflow across the IHPS and Indigo product offerings. HP will demonstrate the Inkjet Web Press at Drupa 2008 and will offer it as a product sometime in 2009. InfoTrends has been fully briefed on this product and will produce a separate analysis on this new development in the coming weeks.

Conclusion

These product announcements represent a very significant step forward in many ways. The speed improvements alone are remarkable and will be a key factor in continuing the growth of HP Indigo shipments. This now positions the HP Indigo Press 7000 at speed levels faster than the Kodak NexPress S3000 and the Xerox iGen3 110. What is remarkable is that HP was able to achieve nearly 50% share and a significant market share lead with products that were slower than the competition. With this speed increase HP has the potential to capture even more market share.

Speed will also improve the competitive positioning of the new WS6000 and W7200. Speed, however, is just one factor. Productivity and workflow tools have also made a quantum leap forward with the introduction of the SmartStream workflow portfolio. PrintLink, as a central component in the new HP SmartStream Production Pro Print Server, will improve productivity and has important workflow implications for all HP Indigo sites, but particularly those driving high print volumes. In addition, HP’s improvements in JDF-enablement and SmartStream partnerships will open up new opportunities across a

range of markets. At the same time, HP continues to improve existing product platforms, such as the HP Indigo press 5500 and 3500.

HP's announcement of a high-speed inkjet division, and an upcoming product demonstration, provide a unique view into HP's overall production print market strategy. HP is broadening its reach in the digital production color arena beyond cut-sheet production color. HP will have a greater impact moving forward in continuous feed. It will be able to solidify its position in industrial markets. With the speed improvements it may even tempt some customers who focus primarily on high-quality and high-speed digital monochrome printing (either cut-sheet or continuous-feed). With these new hardware and software announcements, HP has adopted a strategy that allows it to address broader segments of the printing, publishing and packaging markets. It's a powerful combination that holds much promise for future HP market success.

This material is prepared specifically for clients of InfoTrends, Inc. The opinions expressed represent our interpretation and analysis of information generally available to the public or released by responsible individuals in the subject companies. We believe that the sources of information on which our material is based are reliable and we have applied our best professional judgment to the data obtained.