A New Cost-Effective Solution for Office, Graphics, and Production Printing Environments

Sponsored by: HP

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Overview

A new technology breakthrough shows promise in expanding the role that ink-based printing systems play in office, graphics, and production printing environments as well as uncovering new applications. HP PageWide Technology offers a compelling value proposition with a combination of fast print speeds and low operating costs that can be leveraged across a number of print environments.

Unlike conventional ink-based devices, HP PageWide Technology uses a fixed print bar, thousands more print nozzles, and new ink formulations to deliver a whole new level of printing price/performance capabilities. HP PageWide Technology has already impacted several mainstream printing market segments and promises to stimulate the development of emerging opportunities.

The sections that follow examine HP PageWide Technology's potential role in each of these markets.

HP PageWide Technology and Office Printing

Until now, ink-based devices have rarely been considered an appropriate networked printing resource across office workgroups and departments. Common shortcomings cited by office printer buyers such as slow print speed, low print quality, and high costs of ink cartridges have made it difficult to consider ink-based devices an appropriate option versus conventional laser printing. As such, these devices are often relegated to low-volume, personal printer environments.

HP PageWide Technology addresses many of the traditional inherent shortcomings of ink-based devices, making HP PageWide Technology an appealing consideration for office printing for a number of reasons:

- **Speed.** HP PageWide Technology Officejet printers can achieve print speeds of up to 70 pages per minute. This is faster than many comparably priced color laser printers.

- **Quality.** HP PageWide Technology printers use pigment-based ink to ensure high-quality output. The use of pigment-based ink limits bleeding (to maintain sharp text), and the output is virtually dry once the ink is placed on the page.

- **Cost per page.** The cost per page of HP PageWide Technology printers undercuts that of laser printers. Depending on page coverage, black output is as low as 1 cent per page, while color pages can be as low as 5-7 cents per page.

- **Robust performance.** Paper input capacities start at 550 sheets and can be upgraded to exponentially higher levels with options. The duty cycle is rated similarly to comparable laser-based equipment.

- **Lower service requirements.** The absence of moving parts (e.g., drum, fuser, belts) and lower energy requirements are a result of the HP PageWide Technology printhead remaining stationary while paper moves under the printhead while printing. This limits service interventions around jamming, part replacement, and service costs. On the other hand, laser-based equipment requires multiple touch points and moving parts to create a page as well as more frequent service interventions for consumables, parts, and service calls.

- **Scalable solutions.** HP offers a range of HP PageWide Technology products to address the specific needs of SMBs as well as enterprises. Enterprise solutions provide an enhanced collection of support for capabilities required in larger companies such as HP OXP solutions, HP Web Jetadmin device management, and security and mobile printing.

Most customers that IDC has interviewed have lauded the performance of and the costs associated with using this new type of technology for the office. While IT departments still want to know the specifics of the printer's technology, users rarely have any interest in these details. Instead, users are most concerned about fast, high-quality printing. HP PageWide Technology delivers on these basic office printing needs. In the past, a shared office printer typically required a laser device, but now, HP has an appealing alternative for office color printing that warrants attention from potential buyers.

HP PageWide Technology and Graphic Arts

IDC believes that HP PageWide Technology has the potential to be the final nail in the coffin for large format toner-based printing systems. These systems have been the primary printing technology serving the technical and reprographics industries because of their combination of speed and low running costs. Color has always been the limitation of large format toner-based solutions, so as color adoption has increased in technical environments, ink-based systems have had a huge impact on the large format toner-based printing business.

One exception to the rapid decline of large format LED printers has been in the production market, where there is a high sensitivity to running costs and speed. In these environments, large format ink-based printers have typically been placed next to large format toner-based printers and are reserved only for prints requiring color, while toner-based devices would produce higher volumes of monochrome prints.

The presence of HP PageWide Technology has the potential to change this model. Toner-based systems produce billions of square feet of large format print annually, largely because ink-based printers either have been too slow or have had running costs that are too high for production environments. HP PageWide Technology can offer dramatically higher speed and lower running costs than existing ink-based solutions and even better speed and lower running costs than toner-based solutions. With a rated speed of up to 30 D/A1 size pages per minute, the HP PageWide Technology large format printer is faster than the fastest monochrome large format LED printer on the market.

Part of the new HP PageWide Technology large format ink-based solutions will have to be workflow based because it will take faster image processing on the front end and improved media handling through the production side to keep up with the print speed that PageWide systems are capable of. Indeed, new tools such as RIP solutions and new media handling options are being employed to suit the needs of production

environments, and they can offer substantial benefits. On the front end, the HP PageWide Technology large format printer is designed for easier printer management with built-in automatic closed-loop alignment and color calibration. On the finishing side, the HP PageWide Technology large format printer is available with high-capacity output devices such as a high-capacity stacker and folder. This combination of speed and output handling promises to offer labor savings in many environments where both large format toner-based and large format ink-based printers are used because now it is necessary to collate monochrome LED prints and ink color prints within a document set.

HP PageWide Technology printers that have the ability to print cost effectively in both color and monochrome, reduce running costs, and offer significant labor savings over toner-based printers will accelerate the print volume shift away from large format toner-based printing.

HP PageWide Technology and Web Presses

HP PageWide Technology has its roots in proven production-class inkjet printing at high productivity. HP's T400-series Color Web Press can print up to 800 feet per minute. That is very fast. High print speed is necessary if digital production wants to make inroads on grabbing pages from offset devices that produce over 95% of the pages printed today. HP is leveraging its R&D to make really big productivity gains that will continue to push that crossover point in digital ink's favor.

HP first unveiled its high-speed ink-based device aimed at the production print market in 2008 with the T300 Color Web Press, a 30in.-wide continuous feed platform. Since that time, HP has brought a 20in.-wide platform (T200) and a 40in.-wide platform (T400) to market, along with numerous hardware upgrades and technology improvements to the entire family of products.

The production market demands a high level of output quality at a high rate of speed. Since the introduction of the T-series, HP has continued to develop new printhead technology for the T-series to ensure delivery of both output quality and speed. The current T-series presses run on second-generation heads — the HP A51 Printhead — and HP recently announced its latest innovation: the High Definition Nozzle Architecture (HDNA) that prints with two different drop weights: a low drop weight and a high drop weight. The HDNA and current HP A51 Printhead have the same high drop weight, and the low drop weight of the HDNA is a fraction of the low drop weight of the HP A51 Printhead. HDNA doubles the number of nozzles on a printhead to 2,400 per inch over the same size form factor. Dual drop weights allow printing with smoother tone transitions and finer grain in highlights and midtones. Printheads used in HP's Web Presses have built-in nozzle redundancy for reliable print quality. This redundancy is very important because it eliminates visible streaking from jetouts, which can be an issue with piezo ink technology and continuous inkjets.

Continual improvements in HP PageWide Technology will help drive more volume to a greater collection of applications, including publishing, direct mail, and general commercial print. The combination of image quality and productivity gains will open up more applications for HP's Web Press customers. HP has been very savvy in the design of its Web Presses, all of which have been built for upgradability. As HP PageWide Technology progresses, all HP Web Press customers have the ability to upgrade their presses in order to take advantage of the image quality and productivity improvements of HDNA.

HP PageWide Technology and 3D Printing

While office, graphics, and production represent current implementations of HP PageWide Technology, we also anticipate future expansion into new markets. A good example of this is in 3D printing. HP has already announced its Multi Jet Fusion 3D printer, slated for a 2016 debut, which incorporates wide HP printheads to produce parts, shapes, and objects. Its implementation is slightly different from what we have observed in other markets. Instead of a single nozzle head moving around the platen (the work area), an array of nozzles scans the entire platen and deposits drops of fluids in the appropriate places.

Speed is clearly the number 1 improvement that HP brings to the market. In fact, HP claims Multi Jet Fusion is 10x faster than like products from competitors. For comparison sake, HP says that, when printing the same gear 1,000 times, it would take 83 hours with extrusion methods, 38 hours with laser sintering, and just 3 hours with Multi Jet Fusion.

HP is not targeting the consumer market or even the rapid prototyping market. The growth area is the commercial space, and compelling economics mean that HP is targeting central production for enterprises as well as for service bureaus. Speed matters for production. Cost does, too, and it becomes an even greater issue as the size of the part increases. If HP can address the issues of price and volume, Multi Jet Fusion has the potential to be truly disruptive.

Strength of the part also matters, especially if it is going to be used in end-use parts manufacturing. HP has shown an example of a chain link printed with Multi Jet Fusion technology that was able to successfully lift a 10,000lb car without breaking. While there are already people in the 3D printer market who wag their fingers at the powder-based process that HP is employing, we do liken this to the digital versus offset debate in the production print business. Do people really care how their models are created or how their parts are produced? If you can address the speed, accuracy/quality, and cost conundrums, the answer of "how" becomes less important.

The potential 10x speed improvement is a game changer on its own. Making both the printer and the output produced more affordable is a huge deal as well because economics are one of the biggest barriers to greater 3D print consideration and adoption. HP says the Multi Jet Fusion printer will be less expensive than other printers in its class in terms of the cost of the device and the cost of the part produced, but specific pricing won't be known until the 2016 launch.

Future plans for Multi Jet Fusion include color printing and the ability to change the elasticity of the material and the texture of the part. We do expect HP to eventually broaden its line to be inclusive of desktop 3D, as well as production 3D with a bigger platen than the current prototype.

Challenge

The major challenge HP faces in introducing its HP PageWide Technology solutions is in addressing well-entrenched perceptions of conventional ink imaging technology. Traditional weaknesses of ink-based devices are firmly established, and many potential buyers have a strong bias against this technology as a result of previous experiences. While many potential buyers will claim no bias in their printer decision making, their buying actions often translate into making the safe decision by staying with conventional and established technologies. IDC's qualitative customer research has even pointed

out decision makers' attempts to avoid highlighting the technology with users in an effort to stave off any prejudices against it and put the device through its paces.

HP is attempting to get customers to try something new and different, which goes against making the easy, traditional printing technology choice. The proposed value proposition needs to be strong, and the company will need to use its substantive sales and marketing resources to persuade customers that this new implementation of ink-based printing is proven and works reliably. There are certainly proof points from the HP inkjet technology underlying HP PageWide Technology: HP Inkjet Web Presses print 4 billion pages a month as of 2014. If HP can effectively counter any existing market negativity associated with HP PageWide Technology, it will be positioned to do well as an appropriate printing solution for all of the opportunities discussed in this document.

Conclusion

HP has advanced ink-based printing to new heights with HP PageWide Technology. We anticipate that the company will maximize this technology to the fullest in order to capitalize on opportunities already apparent in the established office, production, and large format printing markets. In addition, it is clear that HP will bring these same attractive value propositions to new and emerging print markets.
3D printing is one example of many new possibilities where HP anticipates utilizing HP PageWide Technology to deliver productivity and cost benefits to its customers, and we expect more to come in the near future.

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