

# The Production Digital Printing Market: Opportunities and Trends

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## Abstract

This paper provides an overview of the production digital printing market and includes forecast and market research data that highlights the opportunities and trends in this area, with a focus on production color.

## A Changing Marketplace

As we look at the opportunities we must observe them in the context of the changes in the printing industry as a whole. The foundations of this business are transforming. The value proposition that we offer to our customers has changed:

- Printing is no longer a manufacturing business offering “good-enough” products. It is a customer-centric service industry offering 24 by 7 global access.
- In the last century printers provided specialized services as independent suppliers. In this century, that is not possible. Only through alliances will printers be able to meet all their customers’ needs, and only through partnerships will they be able to develop the requisite infrastructure.
- Print on paper was the primary product, but printers must now offer non-print services as well as non-paper-based communication services in order to keep growing.
- Printed communications are becoming increasingly targeted and customized, requiring new skills in data mining, variable data printing, and one-to-one marketing.
- And finally, and perhaps most importantly, the printing industry is a fragmented industry, ripe for consolidation, and CAP Ventures expects to see much of that consolidation occur during the coming years.

As print providers change their approach to the evolving business they must take into consideration that past processes must change. This evolution requires that they re-assess their infrastructure and add services such as document management, web access to document repositories, electronic document distribution, data mining, variable data printing, distributed printing, fulfillment, and kitting services. This provides “one-stop shopping” for printing and related services. Print service providers must make these changes to assure their future success.

Research from organizations such as NAPL (the National Association for Printing Leadership) indicates that digital printing is one of the key service offerings that print providers intend to add. Feeding and finishing services topped the list (50.5% of interviewees). However, digital devices were the choice of a third of the respondents.

## The U.S. Printing Industry and the Print On Demand Opportunity

To put the current state of the market into perspective, it is important to understand some facts about the U.S. printing industry and the impact that digital printing technologies are having on it.

### The U.S. Printing Industry

According to government data, the printing industry is the fourth largest non-durable goods segment in the United States. CAP Ventures estimates that printing, publishing, and related industries generated approximately \$328 billion in retail value of print during 2001. Not every segment in the printing, publishing, and related industries has an affinity to digital printing. CAP Ventures has identified primary, secondary, and specialty industries within the printing, publishing, and related industries. The primary industries (i.e., the ones that have the greatest affinity to digital print) include commercial lithography, business forms, prepress services, direct mail, photocopying, in-plant print shops, and data center print departments. CAP Ventures estimates that the total revenues for this category were approximately \$117 billion in 2001. This breakdown allows us to assess the production digital print opportunity in a context that more accurately sizes it in comparison to its served markets.

### Defining Print On Demand

CAP Ventures uses the term “Print On Demand” (POD) to refer to the opportunities in production digital printing. At CAP Ventures we define Print On Demand as printing and delivering:

- What the customer needs
- When the customer wants it
- Where the customer needs it

Print On Demand is the digital automation of the graphic arts printing process. It takes advantage of

information technologies and builds on top of traditional printing and high-speed copying processes. (See Figure 1.)

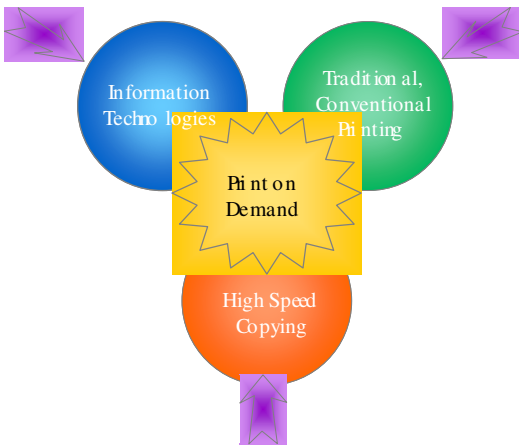


Figure 1. Print On Demand

**Production Copying and Digital Printing**

Print On Demand is related to information systems and high-speed copying. Because of these ties, CAP Ventures closely follows not only the Print On Demand market, but also the activity in Data Center/MIS Printing and High-Speed Copying. These other categories are critical for understanding the trends impacting the industry. Of course, Data Center/MIS printing is one of the earliest users of production digital printing technology. High-Speed Copying, while an analog process in the past, is moving to digital at a rapid rate.

CAP Ventures defines Production Copying and Digital Printing as the combined Print On Demand Systems, Data Center/MIS Printing, and High-Speed Copying markets. (See Figure 2.)

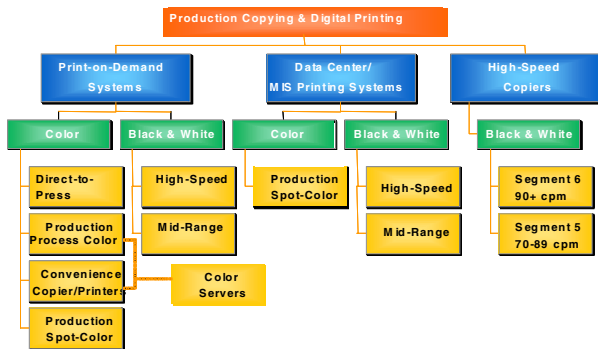


Figure 2. Production Copying and Digital Printing

**The Print On Demand Forecast**

CAP Ventures' Print On Demand forecast is divided into two sub-groups Color and Black & White. (See Figure 2.) Using primary and secondary research, CAP Ventures takes into consideration market economics, vendor information, actual placements, and analysis of service, supplies, and print volume. The end result is a market forecast that covers all aspects of production digital

printing. The forecast extends from placement of new units all the way to the projected retail value of print produced by these devices.

CAP Ventures forecasts that the Print On Demand segment will grow from \$26 Billion in the U.S. in 2001 to just over \$50 Billion in 2006, a 14% compound annual growth rate (CAGR). This rapidly growing segment should be of great interest to print service providers, particularly when they see that the overall "primary" industry, as defined by CAP Ventures, will only grow from \$117 Billion to \$129 Billion during the same period, a 2% CAGR.

CAP Ventures forecasts that the color segment within Print On Demand will grow from \$17.3 billion in 2001 to \$33.4 billion in 2006. During the same period CAP Ventures expects the black & white segment to grow from \$8.9 billion to \$17.1 billion. (See Figure 3.) Based on impressions, the black & white market would be larger, but when you consider the dramatic difference between pricing for color and black & white pages, the color market ends up being larger from a retail value of print perspective. (Keep in mind that a digital black & white page may cost only pennies while a digital color page could cost fifty cents to a dollar or more.)

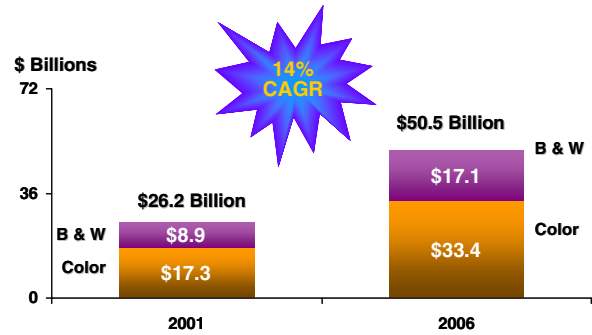


Figure 3. Retail value of print from CAP Ventures Print On Demand Market Forecast 2001-2006

**Print On Demand Growth Trends**

Looking at the forecast, several trends bode well for the Print On Demand market. These include:

- 6% growth in new unit placements
- 13% growth of the year-end installed base
- 16% growth in annual impressions
- 12% growth in supplies, service, and equipment revenues
- 14% growth in retail value of print (even though the price per impression price is declining at 2%)

**Print On Demand Global Trends**

Analog copying is becoming obsolete, as digital technologies become more affordable and provide significant improvements in print quality and workflow. As this happens, analog devices, which comprised most of the installed base in the past, are retired and are replaced by more efficient digital solutions.

In addition, increased competition on all fronts is driving change in the market.

### **High-Volume Production Black & White**

In high-volume production black & white, a number of trends are clear:

- Higher speed products that are capable of producing higher print volumes are impacting overall unit placements. This means that fewer systems can produce the required print volume.
- There is increased competition in the cut-sheet market. This stems from the influx of new mid-volume Segment 5 (70-90 page per minute) and Segment 6 (91+ page per minute) digital copier/printers.
- Increases in speed and quality, combined with decreases in cost of operation, are allowing print service providers to compete more effectively in this low-margin market segment.
- At higher volumes, high-speed inkjet technologies allow some print providers to reduce costs and increase profitability.

### **Mid-Volume Production Black & White**

In mid-volume production (under 1 million monthly impressions), the influx of mid-range black & white devices from a variety of Japanese vendors is challenging the dominance of traditional vendors. These devices are fully featured and do not require a large capital investment. Though this is clearly an opportunity, many of these vendors do not have a lot of experience serving production markets.

### **Production Color**

New production technologies are emerging that will spur growth in color printing by breaking existing quality and cost barriers. These systems will promote page volume growth and some will provide hybrid output of mixed black & white and color print jobs.

Because it is such an important growth area, a detailed discussion of trends in production color printing is included below.

## **Trends in Production Color Digital Printing**

The production color printing segment of CAP Ventures' Print On Demand forecast includes digitally connected printing systems. In addition, these production systems are used in manned environments such as commercial printers, quick printers, in-plants, and digital trade services.

### **Defining Production Color Digital Printing**

Production color devices can output 24 or more unique 8.5" x 11" four-color pages per minute. All current products in this class support paper sizes up to 12" x 18", which enables printing of full bleed 11"x17" images. These devices also offer duplexing capability (if not standard, then as an option).

### **Selected Product Vendors:**

Vendors who have production color printing solutions include:

- Canon: CLC 2400, CLC 1000, CLC 3100, CLC 5000
- Heidelberg/NexPress: NexPress 2100

- Hewlett Packard/Indigo: 1000, 3000, 3200, w3200, w3400
- IBM Printing Systems: Infoprint Color 130 Plus
- Océ: CPS 700
- Scitex Digital Printing: VersaMark BCP, VersaMark Vantage
- Sharp: AR 250c
- Toshiba: CF25
- Xeikon: DCP 500D, DCP 320D
- Xerox: DocuColor iGen3, DocuColor 2000 Series (2045 and 2060), DocuColor 6060

This group of products can be divided between single-function printers and multifunction copier/printers. Each of these groups has attracted different users in the past, but as in the black & white market for production multifunction systems, with time these systems evolved into single-function systems that were supported by an integrated workflow. In these systems, functions such as scanning and printing were separated in order to maximize throughput and optimize work processes.

### **Key Technology Trends**

Trends in this area are best viewed in two categories: single-function (i.e. print-only) devices and copier/printers.

### **Single-Function Production Color Printing Systems**

Key trends in this area include:

- Quality: Vendors have improved print quality; enabling print providers to offer expanded print services. This includes 600 dot-per-inch (or higher) and multi-bit resolution, and enhanced laser imaging units. Automated features are being implemented to enhance the quality control features of print engines.
- Substrates: Vendors have improved substrate handling, including support for higher speed printing on heavier substrates. They have also expanded paper capacity.
- Service: Vendors have improved productivity and uptime as well as prolonged the life of high frequency maintenance items. Many vendors have increased the number of user-replaceable service components.
- Print speeds: Print speeds continue to rise.
- Workflow: Digital front-end tools for job make-ready and workflow are also helping productivity. The front-end systems are being designed to enable novice users to take advantage of the system's capabilities while still providing the high-end tools for more skilled users.
- Supplies: Vendors have adapted their supplies to enable high quality imaging at competitive costs. Developments in regard to new toners and inks have the potential to drop costs even further.

### **Production Color Copier/Printers**

Key trends in this area include:

- Reduced product price: A variety of faster color copier/printers are available at appealing prices. These lower priced offerings also benefit from embedded controllers and printer-only versions of existing copier/printers.

- Operating cost: New products have compelling black & white cost metrics. In addition, the impact of chemical toners has the potential to decrease color consumable costs.
- Resolution: All new products are at least 600 dot-per-inch resolution.
- Service: Service plans are being matched to user's monthly volume requirements.
- Competition from printers: Devices in the production class have typically had a copier heritage. Now, competition from low-end production digital color printers (that are truly printers) has users looking across product categories when purchasing.

### Production Color Digital Printing Forecast

Ongoing reductions in equipment price and operating costs are expected to help this product class grow its placements at 14% CAGR from 2001 to 2006. These systems continue to attract print service providers who had previously doubted the quality and reliability of these systems. For the same period, impressions will grow 38% CAGR, which will generate 25% CAGR growth in equipment, supplies, and service revenue for vendors. End users will benefit from a 22% CAGR growth in retail value of print.

The distribution of new unit placements shows overall growth in both the single-function printer and the multifunction copier/printer categories. Both product categories benefit from new product introductions during the latter part of the forecast period. The single-function category also benefits from new products that are targeted at the commercial printing industry and are configured and priced in a way that print-for-pay environments find attractive.

The multifunction systems are becoming faster and less expensive to manufacture. These inexpensive high-speed systems enable the use of color in many environments. Towards the latter part of the forecast, CAP Ventures expects that some of these systems will cross over into workgroup environments.

Product usage, particularly as reflected by monthly print volume, is a key differentiator between single-function and multifunction products. These single-function products include some very high-volume systems such as the Scitex Digital Printing VersaMark BCP (Business Color Press). This device is capable of 2,180 pages-per-minute and is targeted at volumes of a million or more impressions per month. In general, the single-function devices are not printing such lofty volumes. They average about 125,000 color, single-sided, letter impressions per month. On the other hand, multifunction systems maintain a relatively smaller monthly print volume of around 35,000 impressions.

As the installed base of system grows, CAP Ventures expects to see the bulk of the impressions printed on single-function devices. By 2006, CAP Ventures forecasts that 36.6 billion impressions will be printed on single-function devices, while about 17.8 billion impressions will be printed on multifunction devices.

## The Market Perspective

As digital production color systems make their way into the market place it is important to assess their present success and potential future by understanding their acceptance by both print providers and print buyers. In a recent CAP Ventures market research study entitled "The Next Generation Digital Color On Demand Printing Opportunity" print providers and print buyers were asked about digital color.

### What is the Biggest Perceived Strength of Digital Color?

In response to the question "What is the Biggest Perceived Strength of Digital Color?" print buyers mentioned the following in ranked order:

- Fast turnaround time
- Cost is affordable for short runs
- Can print as needed with little to no waste (vs. long run and inventory)
- Can print variable information or personalized documents
- Can send a job to a location for printing that is closer to the point of need
- Can create versions of a document

### What is the Biggest Perceived Limitation of Digital Color?

In response to the question "What is the Biggest Perceived Limitation of Digital Color?" print buyers mentioned the following in ranked order:

- Cost is too high for long runs (over 1,000 sets)
- Print quality is not good enough
- Can't print specific Pantone colors
- Can't print on the types of paper I use

It is interesting to note that some of the digital production color printing systems in the marketplace actually provide print quality comparable to offset as well as Pantone support (in some cases) on a wide range of substrates. However, as a general rule although the print quality and cost effectiveness of these devices have continued to improve, there is still some resistance to digital color among print service providers.

### Print Applications

The range of applications spans the gamut. (See Figure 4.)

A look at print buyers and their print spending (see Figure 5) shows that digital color printing spending adds up to approximately 29% of their budget. This is a clear sign that digital technology is becoming acceptable and part of the arsenal of solutions available to print buyers.

## What Do They Print - High Speed Digital Color Print Volume by Applications

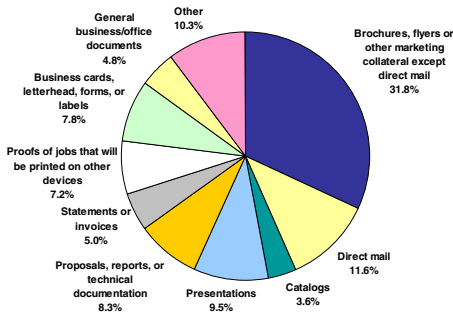


Figure 4. What Do They Print: High-Speed Digital Color Print Volume by Applications. Source: CAP Ventures market research study, "The Next Generation Digital Color On Demand Printing Opportunity"

## What Print Dollars Are Spent On?

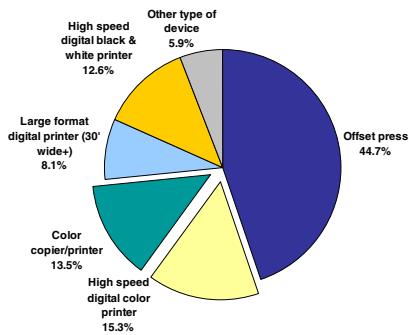


Figure 5. What Print Dollars Are Spent On? Source: CAP Ventures market research study, "The Next Generation Digital Color On Demand Printing Opportunity"

### Variable Data

These applications include variable data (i.e., one-to-one personalization) in which targeting the printed

document to an audience of one is the ultimate goal. CAP Ventures believes that the Print On Demand market for full color variable printing will grow at a 40% CAGR by 2005 (from 3 billion to 12 billion impressions). In a nutshell, personalized printing strives to deliver final documents that enable the document originator to get to the point faster and be relevant to the individual reader.

### Conclusion

In summary, the production digital color printing opportunity is tied closely to the business processes of print providers and print buyers alike. This is fueled by technology and innovation. The following trends are driving the production color market:

- Color printing comprises the lion share of print spending by print buyers
- Print On Demand digital color solutions are being adopted at a rapid rate by print providers
- Digital color print volumes are increasing
- Digital color cost per page is declining
- Cost per impression is dropping
- Quality is no longer a major inhibitor

Based on these trends, one must be optimistic about the future.

### Biography

Mr. Gilboa has over 15 years experience in graphic arts and electronic imaging as related to prepress systems, marketing, product line planning, and business strategies. Before joining CAP Ventures, Ron was a product manager at Scitex America Corp. Mr. Gilboa has a strong technology background in digital photography and scanners, business experience in product development and marketing, and user experience in digital prepress and job workflow. Prior to this position, Ron worked at Scitex Corporation headquarters as a research and development engineer at the Scanning and Imaging division contributing to Scitex's success in scanners and image processing technologies. Mr. Gilboa was also involved in the market development for Scitex digital photography solutions and the latest introduction of Scitex multimedia and Internet technologies. Mr. Gilboa is a graduate of Kiryat Ono College of Photography and the I.A.F Academy.