



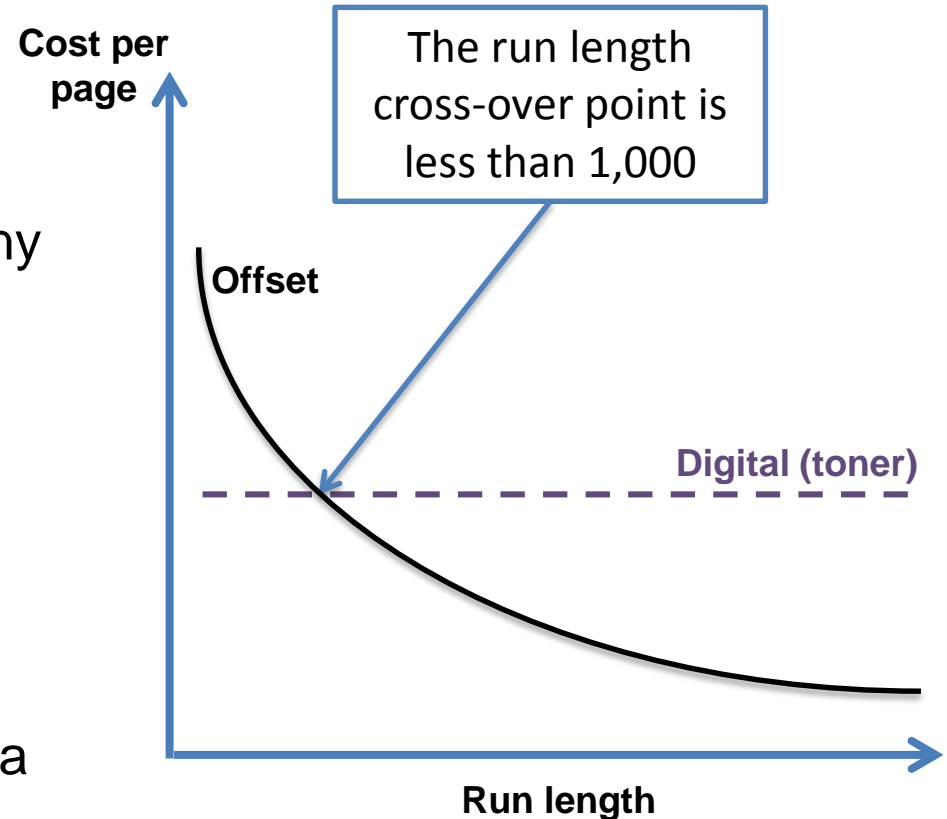
- **Offset versus Inkjet**
  - Run lengths, cross-over points, and the traditional model of offset versus digital
- **Inkjet into the Equation**
  - High-speed inkjet has enhanced digital print's competitiveness
- **Book Printing Workflow**
  - Cost, workflow, and finishing advantages
- **Cost Factors for Inkjet**
  - Calculating how inkjet can make a difference in your business
- **The Bottom Line**
- **Why Canon Solutions America?**

# Offset versus Inkjet

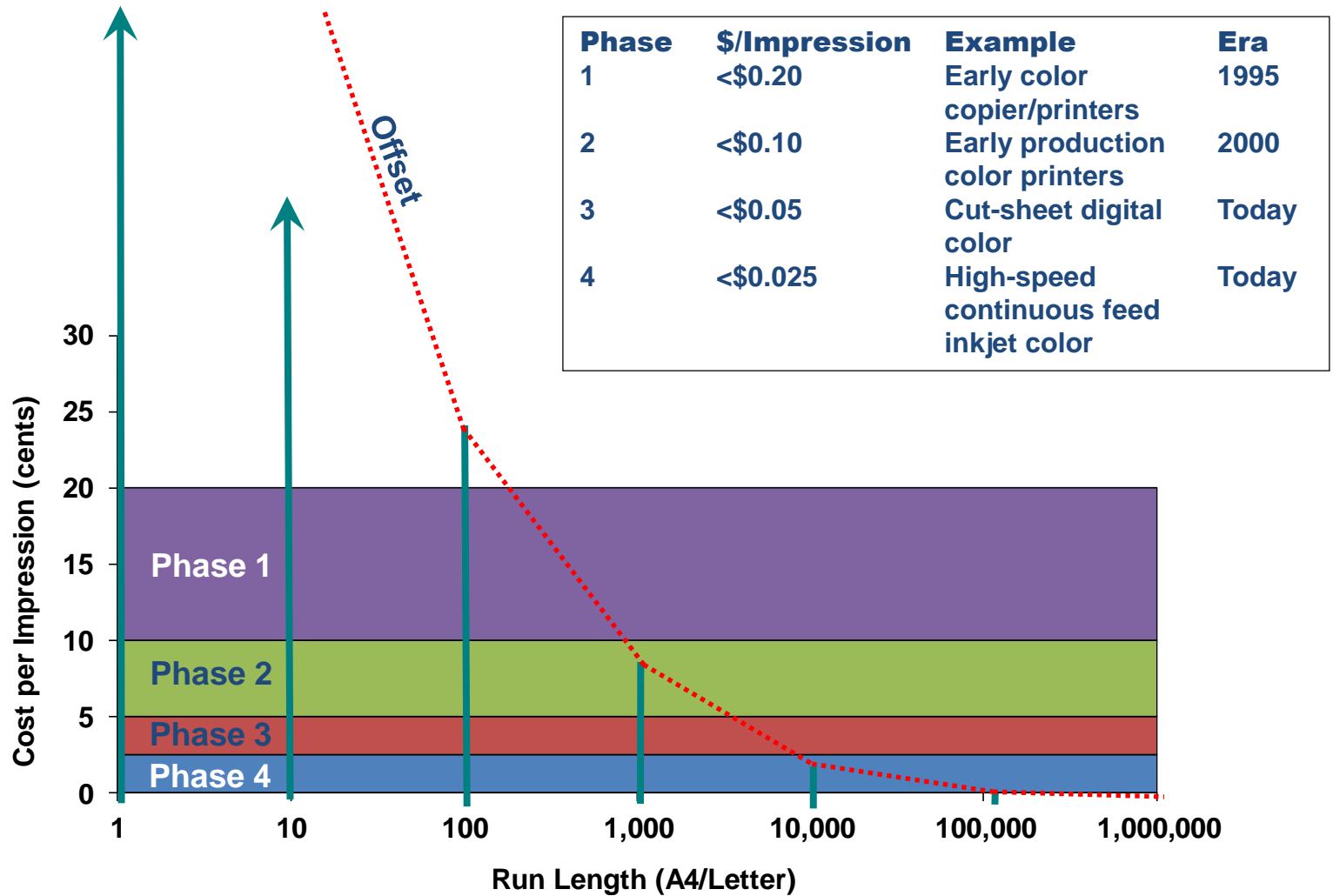


# The Old Value Proposition

- **Offset**
  - A manufacturing process
  - Ineffective at short runs
  - Very effective at making many copies of the same thing
- **Digital (toner)**
  - Can print a new image on every sheet
  - Flat cost structure
  - Excels at short run, quick turnaround, and variable data



# Digital Color Cost Evolution

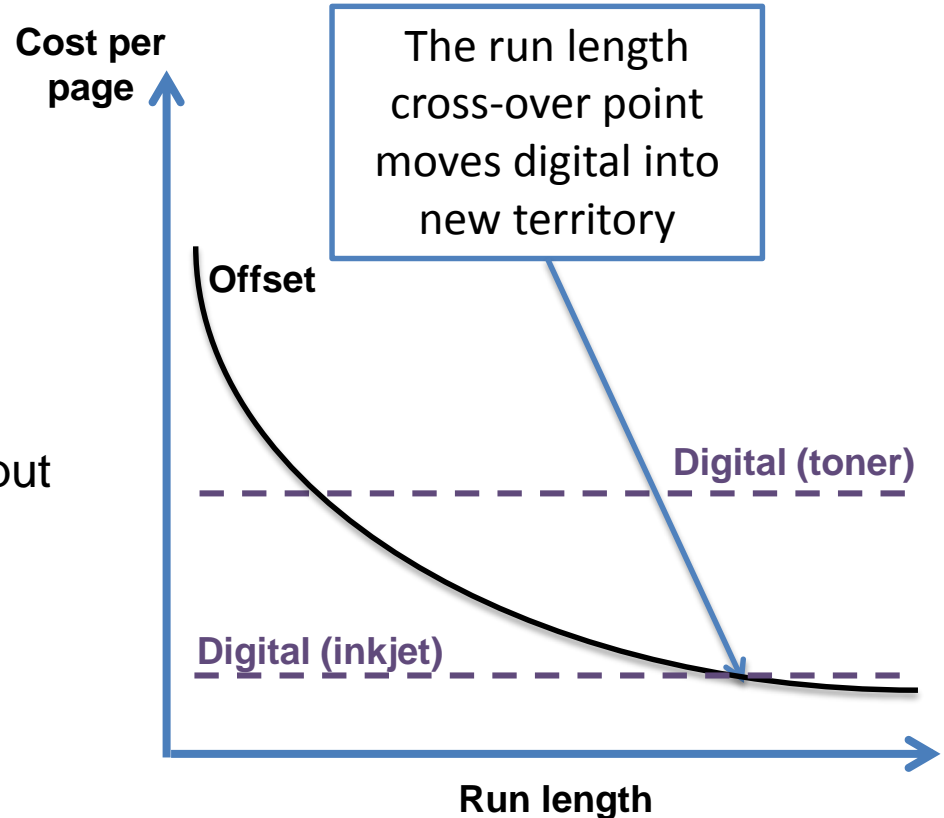


Source: InfoTrends

**Running cost: (1) includes cost of the equipment over expected life + plus service and supplies (2) excludes paper, labor, overhead.**

# Enter Color Inkjet

- Digital (inkjet)
  - All the existing digital print advantages plus
    - Higher speed
    - Higher productivity/throughput
  - Suitable for large volumes
  - Very competitive with offset



# A New Value Proposition

## Business Transformation Model



# Inkjet into the Equation





# Closing the Productivity Gap

Speed PPM

20,000

15,000

10,000

5,000

2,500

1,000

500

250

*Roll-fed inkjet systems have made significant productivity gains since 2008*

*At speeds up to 3,000 fpm*

*Cut-sheet B2 digital systems are just beginning*



Digital Color

Sheet-Fed Offset

Web Offset

# A Range of Color Products

Acquisition Price (list)

\$5,000,000

\$1,000,000

\$500,000

\$100,000

0 0 50 100 250 1,000 2,500 5,000

Throughput (A4 / Letter images per minute)

Cut-sheet Top

B2  
Cut-sheet

Zone of  
Disruption

Continuous-feed Inkjet

# Océ's Inkjet Line-up (1)

- **Two product lines**
  - JetStream
  - ColorStream
    - There are also some toner-based ColorStream models
- **Four categories**
  - **Compact:** Reduced footprint, up to 6 colors
  - **Dual:** Dual engines, up to 5 colors
  - **Wide:** 30" web, dual engines, up to 5 colors
  - **Twin:** Process direction, configurability, up to 6 colors
- **In common**
  - Inks, heads, controllers, platform (ColorStream and JetStream)
  - Flexibility to use dye and pigment inks
  - Mono to color

# Océ's Inkjet Line-up (2)

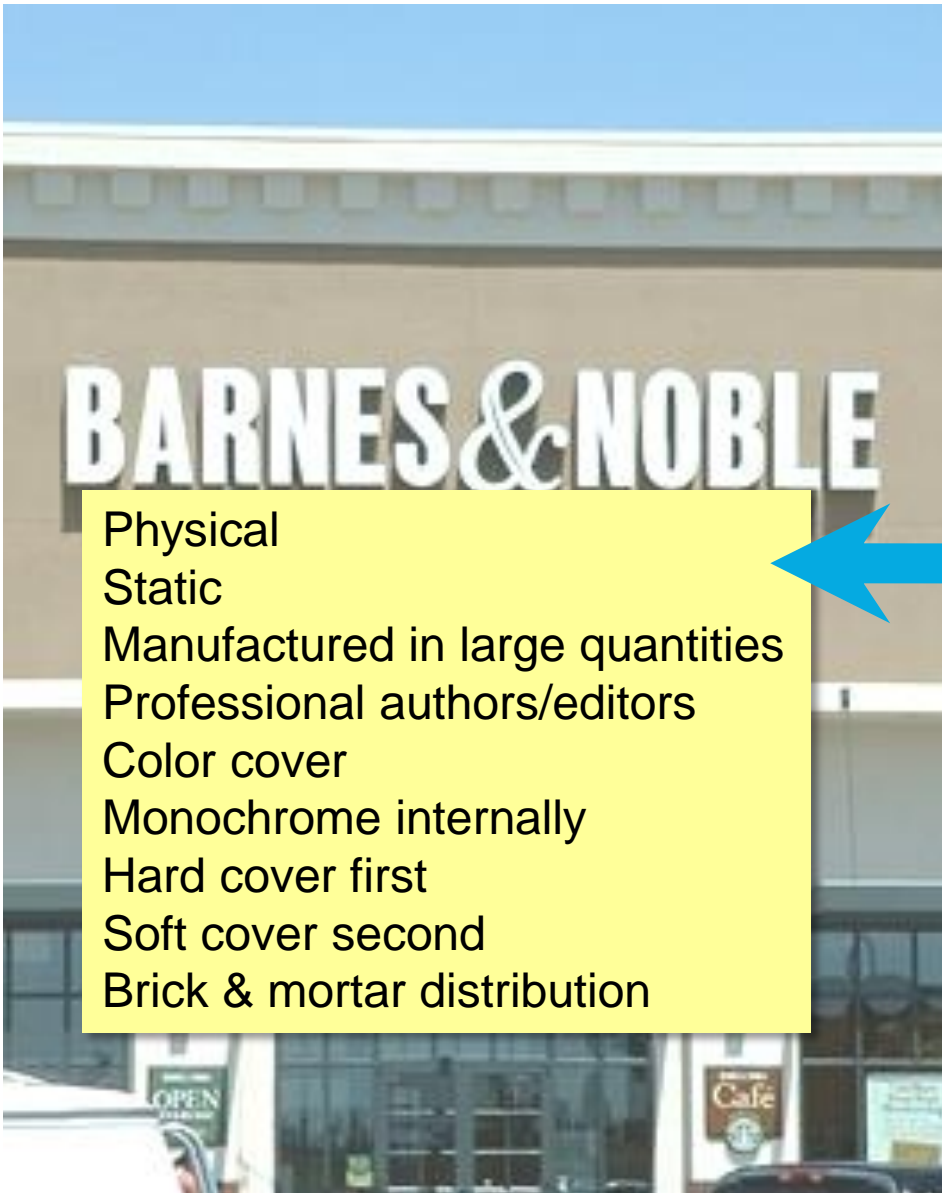
Product Name	Category	Speed (fpm)	Width	Announced	Differentiators
JetStream 1000	Compact	246	20.5"	2009	Reduced footprint; up to 6 colors
JetStream 1400	Compact	328	20.5"	2011	Reduced footprint; up to 6 colors
JetStream 1900	Compact	417	20.5"	2011	Reduced footprint; up to 6 colors
JetStream 1500	Dual	328	20.5"	2008	Dual engine 20.5" system; up to 5 colors
JetStream 2200	Dual	492	20.5"	2008	Dual engine 20.5" system; up to 5 colors
JetStream 3000	Dual	656	20.5"	2011	Dual engine 20.5" system; up to 5 colors
JetStream 2300	Wide	328	30"	2009	Dual engine 30" system; up to 5 colors
JetStream 3300	Wide	492	30"	2009	Dual engine 30" system; up to 5 colors
JetStream 4300	Wide	656	30"	2012	Dual engine 30" system; up to 5 colors
JetStream 5500	Wide	833	30"	2012	Dual engine 30" system; up to 5 colors
ColorStream 3200	Twin	157	21.25"	2012	Process direction*, configurability; up to 6 colors
ColorStream 3500	Twin	246	21.25"	2010	Process direction*, configurability; up to 6 colors
ColorStream 3700	Twin	328	21.25"	2012	Process direction*, configurability; up to 6 colors
ColorStream 3900	Twin	417	21.25"	2012	Process direction*, configurability; up to 6 colors

*\*The ColorStream process direction is right to left while JetStream is left to right*

# Book Printing Workflow



# Evolving Definition of a Book



Physical  
Static  
Manufactured in large quantities  
Professional authors/editors  
Color cover  
Monochrome internally  
Hard cover first  
Soft cover second  
Brick & mortar distribution

A screenshot of a Lulu storefront for Green Harbor Publications. The page includes the Lulu logo, navigation links (Community, Publish, Buy, Shop for), a search bar, and a 'GO' button. Below the navigation is a link to 'Message this storefront owner'. The main content area displays the storefront name 'Green Harbor Publications', its founding date (December 2001), and its owner (44th Bomb Group Roll of Honor). It also lists contact information: Email (Log in to view email), Web (www.greenharbor.com), and Address (416 Webster Street, Marshfield, Massachusetts 02050). At the bottom, there is a book listing for 'The Writing 69th' by Walter Cronkite, with a small image of a soldier in a military cap.

Lulu Community | Publish | Buy | Shop for:  GO

[Message this storefront owner](#)

## Green Harbor Publications

Founded in December of 2001, Green Harbor Publications is owned and operated by the 44th Bomb Group Roll of Honor. Green Harbor Publications is a 501(c)(3) non-profit organization.


**Email:** Log in to view email  
**Web Site:** [www.greenharbor.com](http://www.greenharbor.com)  
**Address:** 416 Webster Street  
Marshfield, Massachusetts 02050  
United States

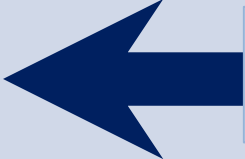
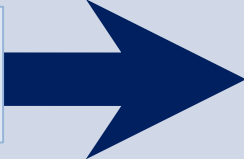
**The Writing 69th**  
Walter Cronkite beat the odds on February 26, 1945, when he was assigned a risky mission: accompanying an 8th Air Force B-29 Superfortress. Robert Perkins Post was shot down over Germany.

Electronic  
On demand  
Connected  
Interactive  
1:1  
Sound & Motion  
Immediacy  
Personal content  
Multiple delivery methods

# Book Printing Definitions

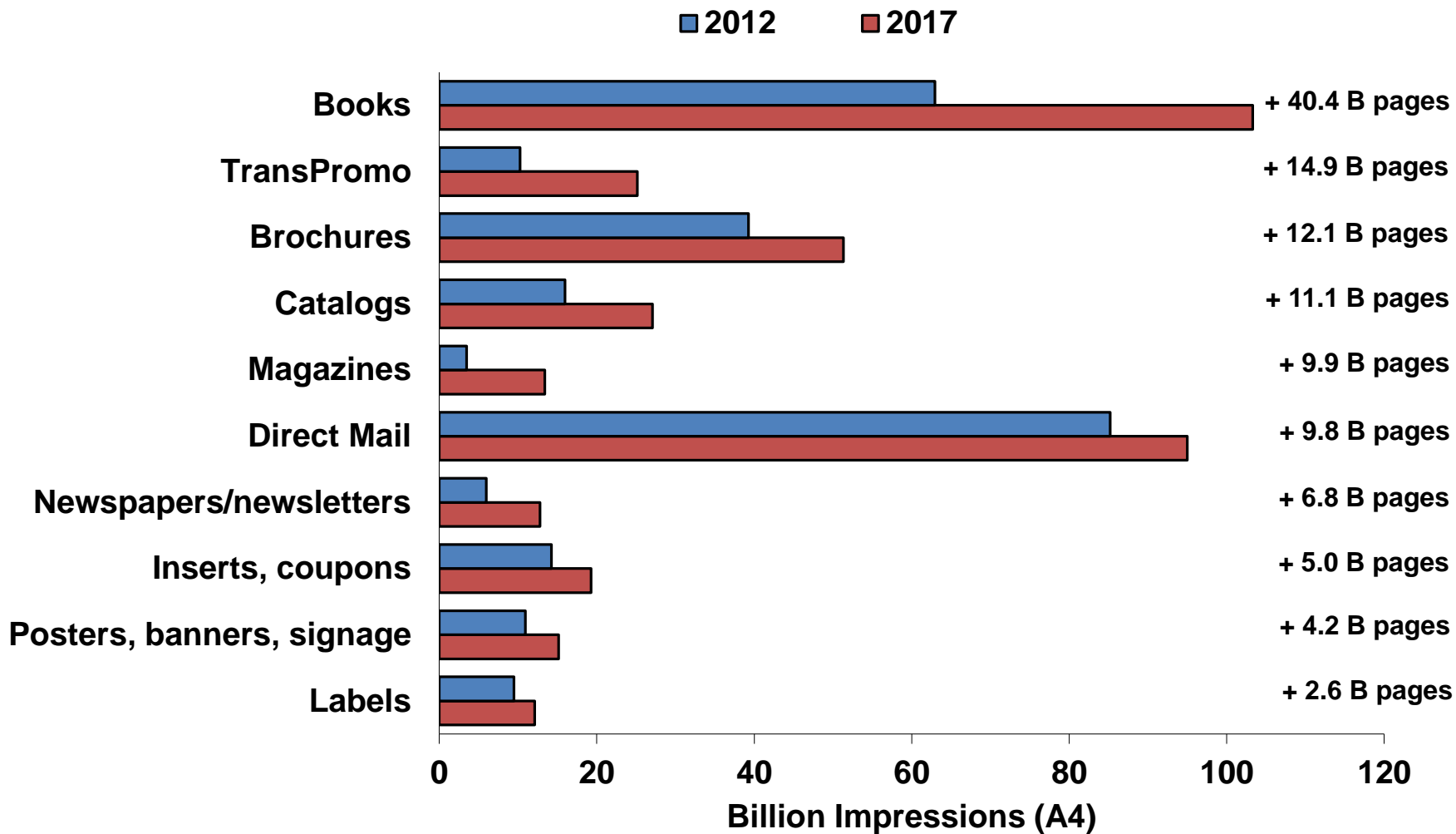
Long Run	Short Run	Print On Demand	Interactive
<ul style="list-style-type: none"><li>• Generally more than 1,000 books</li><li>• Print, warehouse, and fulfill</li><li>• Typically offset printed</li><li>• Production finishing techniques</li></ul>	<ul style="list-style-type: none"><li>• Generally less than 1,000 books</li><li>• Print, warehouse, and fulfill</li><li>• Possible with digital print and offset (depending on run length)</li><li>• Shorter runs tend to be digitally printed</li><li>• Order-taking and finishing must be well suited to smaller job sizes</li></ul>	<ul style="list-style-type: none"><li>• One-off printing</li><li>• The book is not printed until an order is received</li><li>• There is no physical inventory</li><li>• It is only feasible with highly automated digital print</li><li>• It is becoming more common and accounts for a growing segment of the market</li></ul>	<ul style="list-style-type: none"><li>• Connects the physical book to the digital world</li><li>• Uses techniques such as QR codes and augmented reality</li></ul>

**Run lengths are declining** 

Custom books  
Self-publishing  
Photo books  

# Digital Print Applications

## 10 Fastest-Growing Applications: Absolute Page Growth



Source: U.S. Digital Production Printing Application Forecast, InfoTrends 2013



# Book Production Workflow



Source: Transformative Workflow Strategies for Print Applications, PRIMIR, 2011

# From Warehousing to the Virtual Document Repository

- **Warehousing and distribution**
  - Publishers have historically looked to achieve low per-unit manufacturing costs by printing long runs
  - This creates the common “publisher’s dilemma”: If my forecast is off and I print too many books, I won’t be able to sell them
- **Production digital print methods allow distribution channels to be filled more effectively**
  - In shorter “just-in-time” runs or in true on-demand production where the book is not printed until it is sold
- **The digital printer becomes a virtual document warehouse**
  - Software, such as PRISMA Book of One helps manage this process efficiently



# Digital Advantages

- **Electronic collation**
  - This is very important in book publishing for the in-line creation of book blocks that are ready for binding
- **Just-in-time manufacturing**
  - The ability to fulfill the publisher's supply chain as needed is a key advantage
- **Workflow automation**
  - One operator can typically operate a production color inkjet system, and depending on the finishing configuration, is able to handle tasks that are typically the responsibility of multiple operators in an offset environment (platemaking, press operation, and finishing)
  - Removing platemaking from the printing process has ecological benefits (no platemaking chemistry)

- **Offset workflow**
  - Imposition and signatures
  - Folding, gathering, and stitching
  - Offline processes are predominant
- **Digital print workflow**
  - Electronic collation provides much greater flexibility
  - Full book blocks can be delivered in an automated in-line process
  - Books of one and personalization are possible
  - Inkjet takes digital productivity to the next level, allowing large quantities of books to be produced cost-effectively

# Cost Factors for Inkjet



# Cost Lessons for Inkjet

- **The acquisition price, though significant, is a relatively small portion of overall cost, particularly if the device is driven at high volume**
- **Consumables (primarily inks) and service/maintenance are important cost contributors**
  - Area print coverage has a significant impact on running cost
- **Running cost calculations should take paper into account**
  - Paper is a large cost contributor
  - Inkjet-treated papers, though they have decreased in price over time, still may cost as much as 10% to 30% more than comparable untreated stocks

# Primary Cost Components

- **Equipment**
- **Maintenance**
  - Monthly charge
  - “Click” or per-foot charge
  - All-in/comprehensive click
  - Many variations possible
- **Consumables**
  - Inkjet inks  
(dye versus pigment)
  - Related supplies
- **Inkjet heads**
- **Paper**
- **Overhead**
  - Operator
  - Insurance
  - Etc.



# Two Volume Definitions

- **Duty Cycle:** The maximum number of pages a device could deliver in a month running at full capacity
  - Duty cycle provides a comparison of robustness versus other printers
- **Average Monthly Print Volume (AMPV):** Represents the average number of pages that are printed by devices in the field
- **Basic rule of thumb**
  - Duty Cycle = Maximum
  - AMPV = Average



# The Cost Role of the Capital Equipment Purchase

Average Monthly Volume	Equipment cost (per page)
5 million	\$0.0067
10 million	\$0.0033
15 million	\$0.0022
20 million	\$0.0017
25 million	\$0.0013
30 million	\$0.0011

- **Assumptions**

- \$2 million acquisition price  
(roll-to-cut duplex printing system)
- Five-year payment  
(straight line – no finance cost included)

- **Take-aways**

- The equipment is a significant cost contributor at low volumes but becomes much less so at high volumes

# Per Page Inkjet Running Cost Example (1)

	Millions of Impressions per Month					
	5	10	15	20	25	30
Equipment	\$0.00667	\$0.00333	\$0.00222	\$0.00167	\$0.00133	\$0.00111
Monthly	\$0.00125	\$0.00063	\$0.00042	\$0.00031	\$0.00025	\$0.00021
Click	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300
Ink	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300
Total	\$0.01392	\$0.00996	\$0.00864	\$0.00798	\$0.00758	\$0.00732

- **Roll-to-cut system price of \$2 million**
  - Paid for over five years
- **Each impression is letter-sized, four color, and printed two-up at 20% coverage**
- **List pricing for fixed monthly maintenance, click, and ink**
  - No volume discount on click or ink
- **Does not include paper, finishing configuration, financing, operator cost, rent, insurance, or other overhead**
  - Includes installation, shipping, and training

# Per Page Inkjet Running Cost Example (2)

	Millions of Impressions per Month					
	5	10	15	20	25	30
Equipment	\$0.00667	\$0.00333	\$0.00222	\$0.00167	\$0.00133	\$0.00111
Monthly	\$0.00125	\$0.00063	\$0.00042	\$0.00031	\$0.00025	\$0.00021
Click	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300
Ink	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300	\$0.00300
Total	\$0.01392	\$0.00996	\$0.00864	\$0.00798	\$0.00758	\$0.00732

- **Fixed costs are distributed across many pages as volume increases**
  - The per-page impact of equipment cost decreases significantly as volume increases
  - The impact of the monthly maintenance fee (here estimated at \$12,000) also decreases as volume increases
- **In this model, the click and ink stay constant, but it is common for vendors to offer discounts for high-volume users**
- **At 10 million monthly impressions, the running cost drops under 1 cent**
- **Keep in mind that this does not include paper or other overhead**

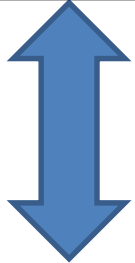
# The Cost Impact of Paper

	Millions of Impressions per Month					
	5	10	15	20	25	30
Equipment	26%	21%	15%	12%	10%	8%
Monthly	5%	4%	3%	2%	2%	2%
Click	12%	19%	20%	21%	22%	23%
Ink	12%	19%	20%	21%	22%	23%
Paper	23%	38%	41%	43%	44%	45%
Total	100%	100%	100%	100%	100%	100%

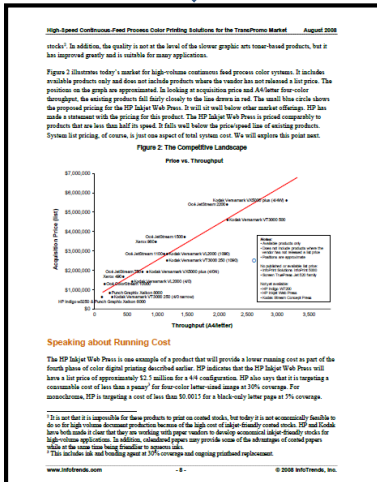
- **Using a cost of \$0.0060 per 8.5” x 11 sheet**
- **Fixed costs like the equipment and monthly service fee become a smaller part of overall cost as volume increases**
- **The cost component from click charges and ink increase as volume increases**
- **Paper is the second largest cost component (at 5 million impressions) and accounts for close to half of the cost at 30 million impressions**
  - Volume discounts for paper could bring this number down some

# Color Ink Coverage

High



Low



- In the previous examples, 20% color coverage is assumed
  - Some pages will be significantly lower in coverage
- Higher or lower coverage changes ink consumption significantly
  - With the resulting cost impact
- Software tools allow you to estimate coverage and track ink consumption

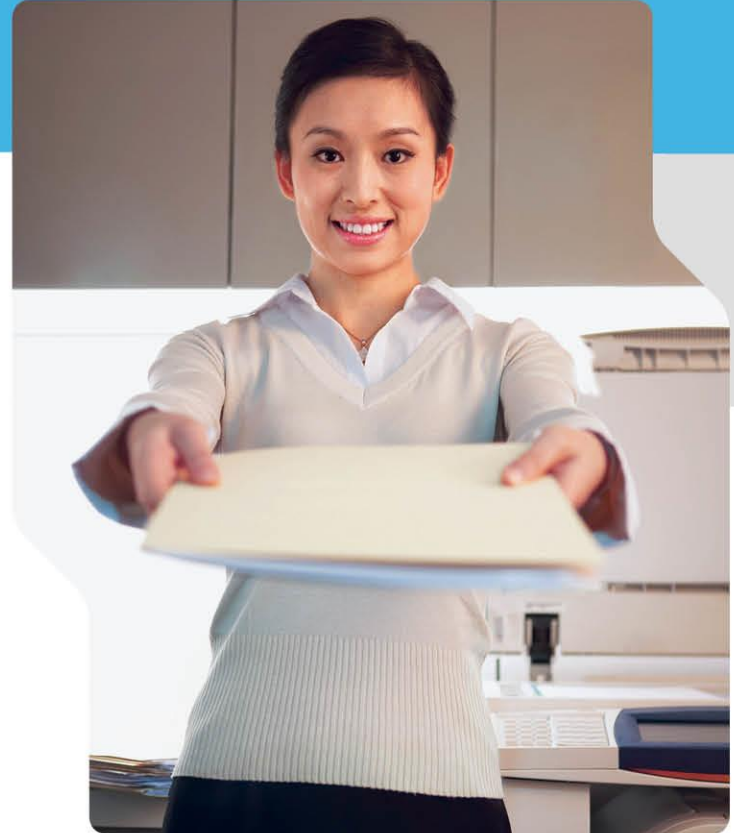
# Black-only Printing

- **20% ink coverage on a black-only page has a different cost profile**
  - Black ink is much less expensive than the process colors (cyan, magenta, and yellow)
  - The click charge for a monochrome page is also less than for a color page
- **The ink and click cost for black-only printing could be as much as 50% less than for color**
  - Lower coverage adds to this cost savings
- **A typical text-only monochrome page is generally no more than 5% coverage**
  - For a black-only page, 20% would be fairly high coverage, but not exceptional
    - Halftones and text dropped out of solid backgrounds can push up coverage

# When Cost Is an Issue

- **Cost-sensitive environments such as transaction and direct mail can gain even further benefits by:**
  - Using dye-based inks, which typically cost less than pigment-based inks
  - Printing light coverage on uncoated commodity stocks
- **Book publishing environments are typically more quality-sensitive and therefore are more likely to use pigment-based inks and inkjet-treated papers**
  - Lightly coated papers are the norm for many book publishing applications
- **Digital print technologies often compete against offset presses that are already paid for**
  - Naturally, this becomes part of the overall cost equation and cannot be ignored when comparing the two technologies

# The Bottom Line





# Conclusions

- **With their high-volume and low running cost, production color inkjet systems are in a whole new space**
  - Way beyond prior toner-based digital methods
  - Competing head-to-head with offset
- **Key digital advantages include electronically collation, just-in-time manufacturing, and workflow automation**
  - Offset cannot compete with these digital advantages
- **Inkjet is competitive at longer run lengths**
  - These are true book factories for everything from book of one to tens of thousands of copies

## Conclusions (cont.)

- **Find the cost sweet spot and exploit the advantage**
  - Use commodity stocks where possible
  - Identify lower coverage applications
  - Promote the use of color across the document
- **Consider how to move from a traditional “print efficiency” model to a “business transformation” model**
  - Help customers avoid the “publisher’s dilemma” of overstocking by allowing them to fill their distribution channels more effectively
  - Give content creators greater flexibility than what is possible with offset printing (more personalized, more colorful, more relevant)

# Why Canon Solutions America?



# A Partner Committed to Your Success

- **Long history of understanding and meeting customer requirements**
- Market leading scalable technology
- End to end solutions
- Professional services for successful execution



# A Partner Committed to Your Success

- Long history of understanding and meeting customer requirements
- **Market leading scalable technology**
- End to end solutions
- Professional services for successful execution



# A Partner Committed to Your Success

- Long history of understanding and meeting customer requirements
- Market leading scalable technology
- **End to end solutions**
- Professional services for successful execution



# A Partner Committed to Your Success

- Long history of understanding and meeting customer requirements
- Market leading scalable technology
- End to end solutions
- **Professional services for successful implementation**





# **Canon Solutions America: A Partner Who Wants to Help You Grow!**

**Canon**  
CANON SOLUTIONS AMERICA



**Any Questions?**

