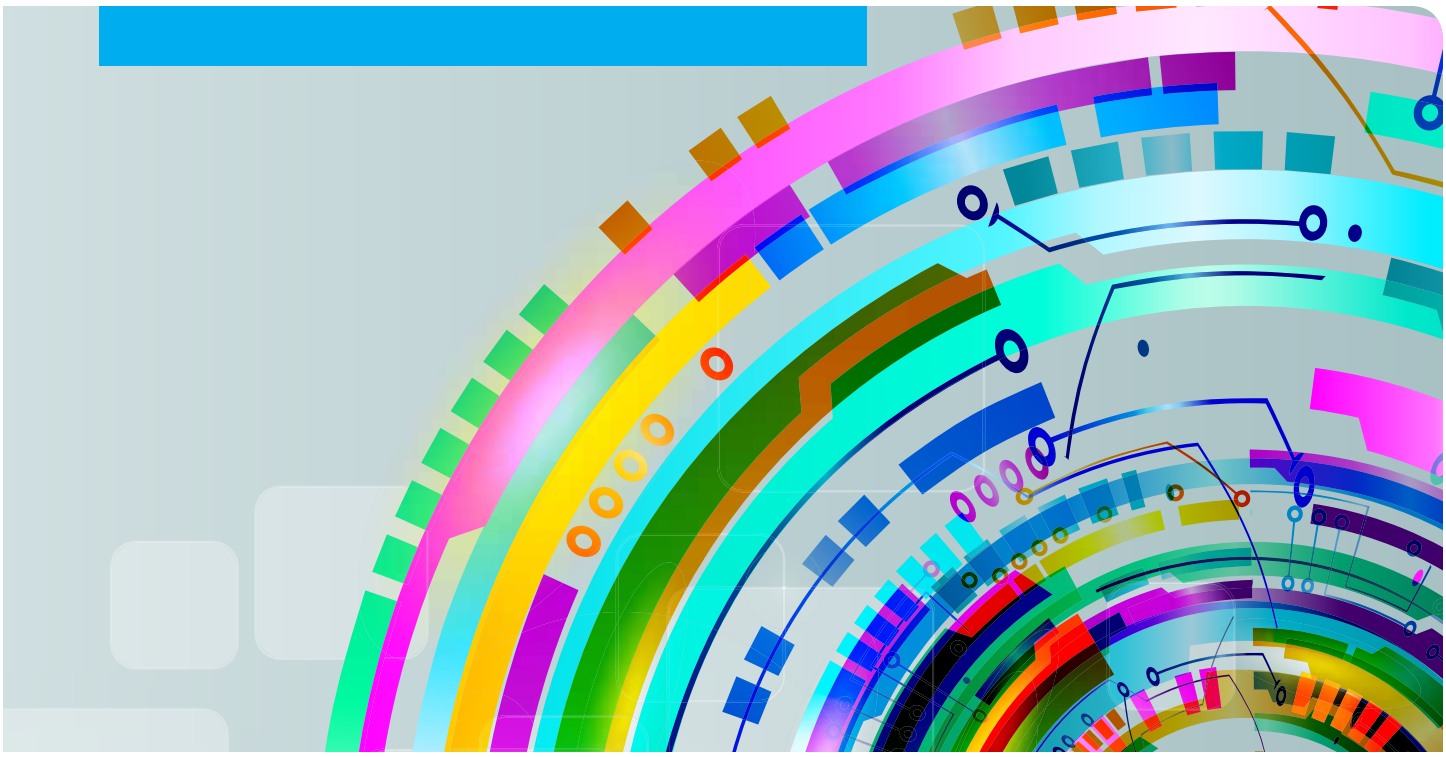

Production Inkjet Printing:
CONSIDERATION, DEPLOYMENT AND END RESULTS

SGIA

NAPCORESEARCH
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Production Inkjet Printing:
CONSIDERATION, DEPLOYMENT AND END RESULTS

INTRODUCTION

The Specialty Graphic Imaging Association (SGIA), whose mission is to provide critical information and insight to the printing industry, contacted NAPCO Media to better understand the current state of the production inkjet printing market in the United States. NAPCO Media, a leading source of printing industry-related information and publisher of *Printing Impressions* and *In-plant Graphics* magazines, as well as the organizer of the annual Inkjet Summit, conducted research during the summer of 2017 to address SGIA's questions concerning:

1. How do commercial and in-plant printers plan to navigate, or have they already navigated, the end-to-end process of considering, evaluating, purchasing, and operating a Production Inkjet press?
2. What was, or what do commercial and in-plant printers perceive to be, the impact of the inclusion of Production Inkjet capabilities on their internal processes, product and application development, workflow, training, sales, ROI, etc.?
3. What was, or what do commercial and in-plant printers anticipate will be, the impact of the inclusion of Production Inkjet capabilities to their business and their clients?
4. What were, or what do printers anticipate will be, the success metrics by which they measure Production Inkjet adoption?

METHODOLOGY

NAPCO Media's Research Group designed and conducted a two-phased research project involving both online surveys and expert phone interviews to address SGIA's need to better understand the current state of production inkjet printing in the United States.

Web Surveys

Surveys were sent to five print market segments to identify their use and adoption of production inkjet technology. Survey respondents were selected from subscribers of *Printing Impressions* (targeting general commercial, direct mail, publication and transactional printers) and *In-plant Graphics* (targeting in-plant printing operations).

The market segments and the number of survey responses from each were:

SEGMENTS	Transaction	Direct Mail	Publication*	In-Plant	Commercial	TOTAL
RESPONSES	49	58	66	185	351	709

**Publication includes: Book, Magazine, Catalog*

Due to variation in the number of respondents per market segment, an 'average' percent response is reported by equally weighting each segment's response. This average response provides an overall response, and a benchmark that segment responses can be compared with.

Phone Interviews

Phone interviews from each segment were conducted to provide a more complete understanding of the key drivers of production inkjet adoption and non-adoption, as well as current user experiences. Some of the online survey participants who volunteered to participate in phone interviews were selected and personally interviewed.

A total of 13 phone interviews were conducted in September of 2017, with a broad distribution of interviews conducted across the segments analyzed in this report (see the following table for more details). Interviewees were asked to expand upon the survey questions to provide additional color commentary around the quantitative analysis. When interviewees agreed to be quoted, their name and company were identified, and interviewees who preferred not to be quoted were identified by their market segment.

*Note: some quotes have been lightly edited to enhance clarity, but their meaning and intent have not been altered.

SEGMENTS	Transaction	Direct Mail	Publication*	In-Plant	Commercial	TOTAL
RESPONSES	1	3	2	4	3	13

**Publication includes: Book, Magazine, Catalog*

EXECUTIVE SUMMARY

Production inkjet printing is the most rapidly expanding form of print technology today, and is a process that has been adopted by half of the U.S. printers who participated in this survey. To understand the production inkjet printing market, who owns it, why they adopted it, what their experience was deploying it, how it affected their business, and how clients accepted it, SGIA commissioned NAPCO Research to answer these questions.

In the summer of 2017, more than 700 Commercial, Direct Mail, In-plant, Publication, and Transaction printers were contacted by NAPCO Research via online surveys and phone interviews to identify their first-hand experiences, challenges and rewards regarding production inkjet printing; why they have adopted continuous-feed and cut sheet production inkjet technology; and for those that have not, why not.

Who Owns Production Inkjet[1]

About half of the printers surveyed own one or more production inkjet printing presses, and have them for over three years, indicating how inkjet printing has rapidly become an established industry technology.

The type of production inkjet press that surveyed printers own varies by market segment, but overall there was a relatively similar number of continuous-feed and cut-sheet presses in use across the segments. Publication (largely Book) and Direct Mail survey respondents reported the highest ownership of continuous-feed inkjet presses at 75+%, with about half of these printers also operating cut-sheet presses — indicating there was a device preference, but by no means a dominance, of one configuration to the exclusion of another, even within segments.

[1] Production Inkjet Printing: Inkjet printing is a method of creating a drop of fluid and placing it precisely on paper or other substrate. This is a highly engineered system that integrates hardware, software, electronics, chemistry, and paper to generate very small droplets of ink and can be used in both primary and hybrid printing applications. Production inkjet printing typically operates at high rates of speed, much like a commercial printing press. (Source: lightly edited for brevity from Digital Print Deinking Alliance)

Overall satisfaction of inkjet press owners was clear, with more than 85% of printers reporting they were Satisfied or Very Satisfied with their moves into production inkjet printing.

Why then, with this high level of satisfaction, did not all survey respondents own production inkjet presses? Quite simply it had to do with 'Lack of Need.' Lack of Need accounted for 70% of the reasons respondents gave for not considering — and 40% of the reasons for not owning — production inkjet, which was at least twice as high as any other reason cited.

Why Printers Adopted Production Inkjet

What drove printers to consider and purchase production inkjet varied widely between segments, indicating there was no single or small group of reasons that drove printers to acquire inkjet presses. Reasons printers gave for considering inkjet varied widely, ranging from faster run speeds, more personalization capabilities, and smaller print runs. Reasons cited for making the purchase decision and selecting the supplier partner were more tactical, but no less varied, and included customer support, cost to operate, and the quality of the printed output.

In selecting OEMs to evaluate or consider when making a production inkjet press purchase decision, four brands stood out across all segments: Canon/Océ, HP, Ricoh and Xerox. At least three of these four OEMs were on each segment's list of the top four OEMs they evaluated or considered.

The due diligence printers found most beneficial in adopting production inkjet, across all segments, was from attending relevant industry events and by determining the total cost of ownership (TCO).

The time printers took from research to the final purchase ranged from less than six months to more than 12 months and was relatively evenly distributed between less than six months, six to 12 months, and more than 12 months. It is a big decision, and printers took the time they needed, whatever it was.

Describing Printers' Experiences in Deploying Production Inkjet

To determine their Return on Investment (ROI), both pre-purchase – to justify their investment – and post-purchase – to determine if it delivered their expectations – printers across all segments used a Cost per Page and/or Total Cost of Ownership analysis.

Respondents' experiences in deploying inkjet, across all segments, were cited as Expected, Easier, or Much Easier Than Expected 80% of the time. This isn't to say that the deployment process was effortless. But the challenges of paper compatibility, generating sufficient volume to keep their inkjet press at capacity, and addressing inkjet output differences versus offset or toner, were able to be addressed and were reflected in the high overall experience.

Additional challenges printers faced in deploying production inkjet — due to its different workflow requirements — included plant layout changes in prepress and postpress/finishing, material handling and inventory changes, and changes to workflow software.

Inkjet deployment also involves the need for training of both operational personnel and sales staffs. The majority of printers, across segments, planned and implemented training primarily by developing internal training programs and by relying on the OEM for on-site and in-field training assistance.

How Production Inkjet Affected Printers' Businesses

Printers found deploying production inkjet expanded their capabilities, enabling them to generate new business opportunities, reduce their costs per job, and deliver more consistent job-to-job color.

Inkjet utilization, across all segments, came from three primary sources: more than half from digital toner and offset output migration, about a quarter from new business, and the remaining from other digital devices and other sources.

Applications most commonly deployed on production inkjet presses closely followed the work each segment is best known for, indicating the addition of inkjet didn't significantly change printers' product offerings, but rather enhanced their existing capabilities with lower operating costs, higher press speeds, reduced press downtime, workflow efficiencies, and other improvements.

How Printers' Clients Responded to Production Inkjet

About one-third of printers' customers, across market segments, either embraced production inkjet output immediately, were indifferent, or did not notice a change. Another third embraced it after seeing the cost savings they could achieve, and about 10% viewed inkjet as an opportunity to create new applications or products. In total, it reflects a high level of acceptance of the technology among print buyers, marketers and brand managers. The remaining quarter of clients were skeptical or needed to lower their expectation from 'offset' quality to 'acceptable' quality in order to accept the move to inkjet.

These and other findings are detailed in this report along with graphs, percent responses, and additional analysis of this research on production inkjet printing adoption and deployment, as well as its impact on the printer's business.

KEY FINDINGS

Key findings from this research including a profile of the printers surveyed; their current ownership of production inkjet presses; the process they went through, pre- and post-purchase; and the impact production inkjet has had on their businesses and their clients.

1. Printer Profile

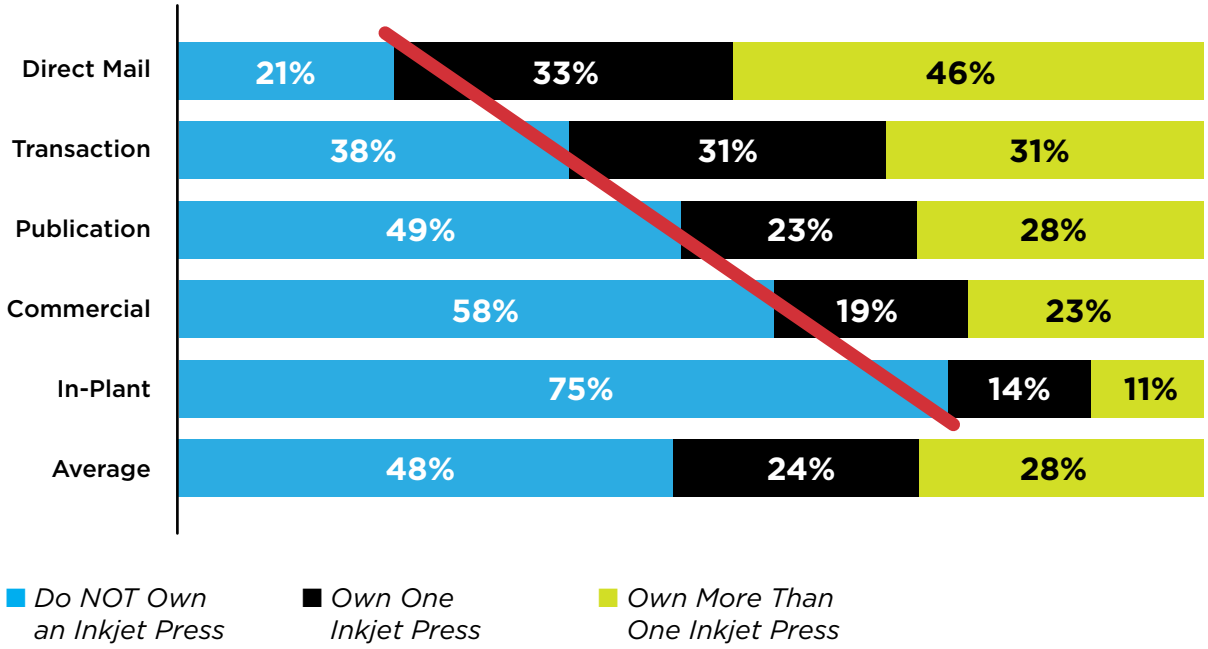
Half of the printers surveyed had fewer than 100 employees and annual revenues under $10 million. Between 25% and 35% of the In-plant, Publication, Transaction, and Direct Mail printers surveyed had 500+ employees and annual revenues greater than $50 million, and about 10% of the Commercial printers had operations of this size.

2. Ownership

- **Current Ownership**
  Half of printers own one or more production inkjet presses. The segment with the largest ownership was Direct Mail at 79% and the smallest was In-Plant at 25%. Other segment ownership rates were fairly uniformly distributed between these extremes as illustrated by the diagonal line in the graph below.

- **Likelihood of Buying**
  On average, 40% of printers were Somewhat or Very Likely to buy a production inkjet press next year, with Direct Mail the most likely at 61% and In-Plant the least likely at 26%, again representing the most and least likely as they did with current ownership. The likelihood of the other segments to buy were all clustered around 40%.

Current Inkjet Ownership



Q: How would you describe your current production inkjet printing capabilities? (Do not include wide-format equipment as this is not the focus of this survey.)
n = 709

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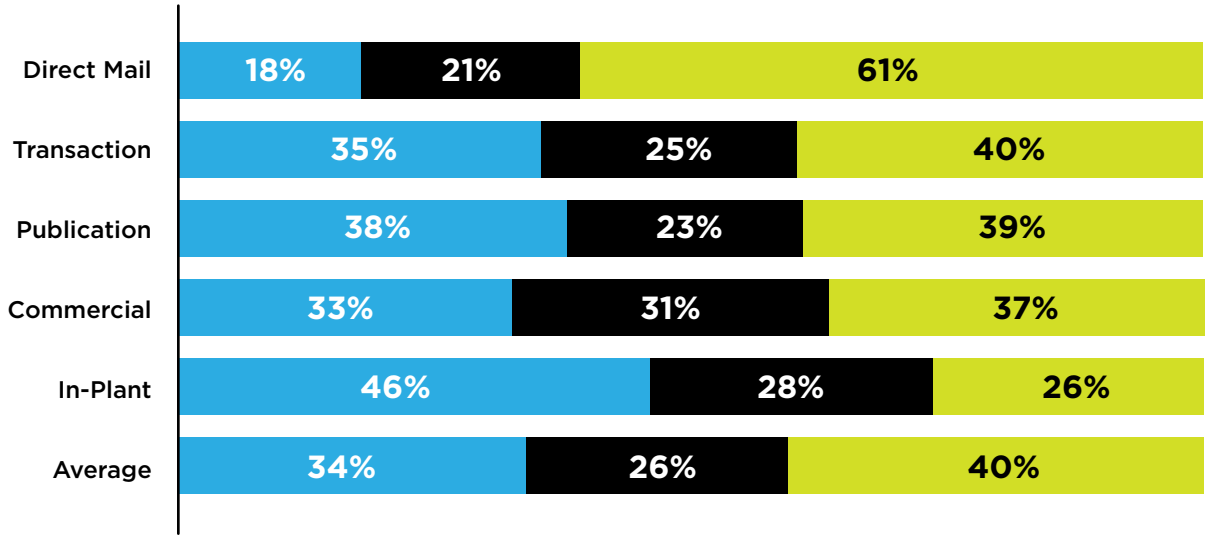
Likelihood of Buying Inkjet Next Year



Q: How likely are you to make a production inkjet press purchase in the next year?
n = 696

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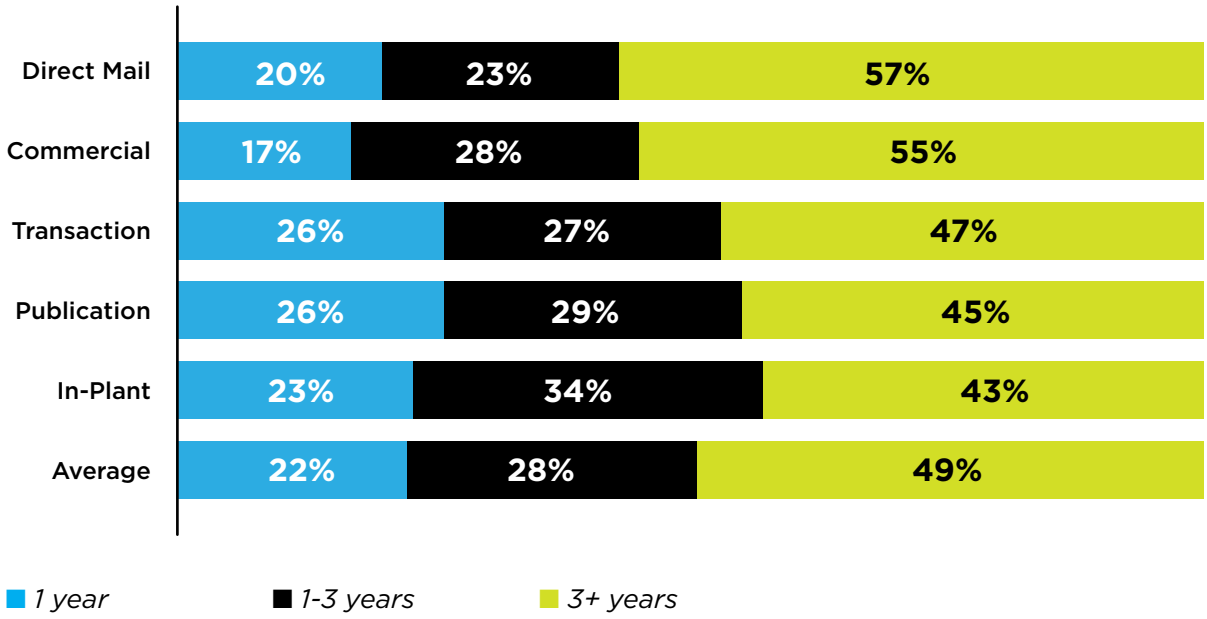
- **Time Owning Production Inkjet Equipment**
  About 80% of printers with inkjet equipment have owned it for more a year or more and 50%+ have owned it for more than three years. The segments showing the longest ownerships were Direct Mail and Commercial, with the other three segments, Transaction, Publication, and In-Plant, all following closely behind.

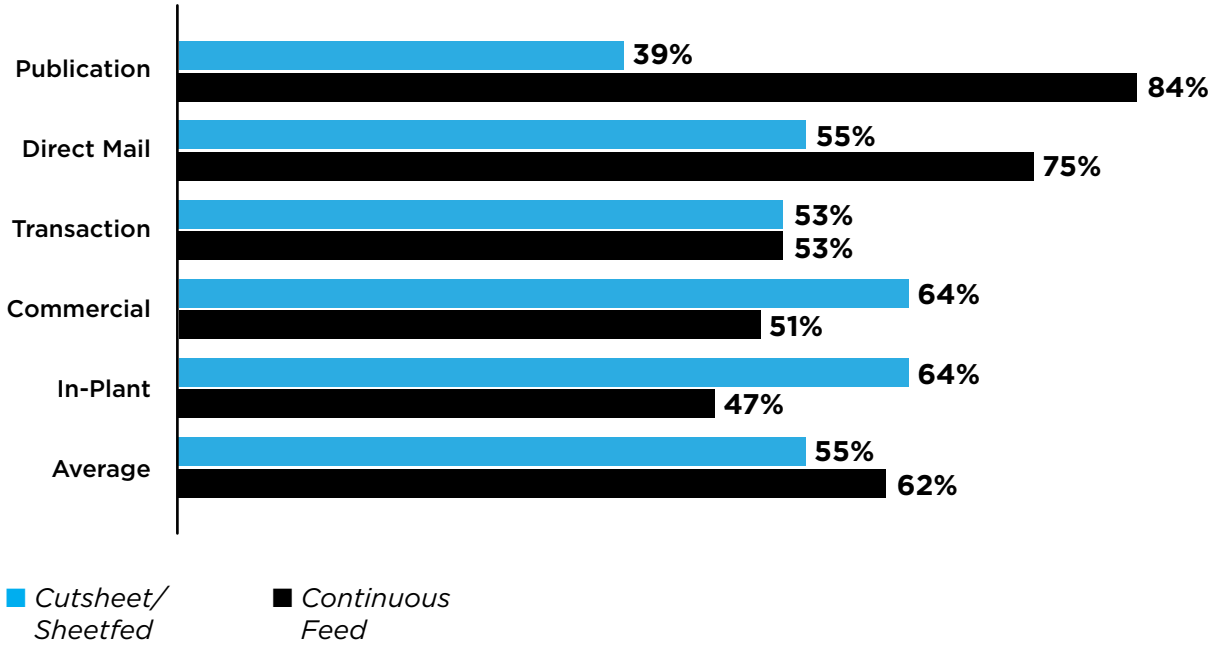
- **Type of Inkjet Device(s) Owned**
  Segments generally showed a preference between owning continuous feed or cut-sheet inkjet presses, but not to the exclusion of the other press types. Publication and Direct Mail showed a clear preference towards continuous feed presses with each having a 75+% ownership rate, far more than any of the other segment. Commercial and In-Plant printers had a preference towards cut-sheet presses, with both reporting 64% ownership, with both also having the smallest ownership rate of continuous feed presses, at about 50%. Overall, there was a somewhat higher ownership rate for continuous feed presses, at 62%, than cut-sheet presses at 55%, leading one to conclude there are solid markets for both types of presses, but there tends to be a preference for one type over another depending on the segment and their print applications.

Time Owning Production Inkjet



Q: For how long have you had your production inkjet equipment?(If you own more than one, calculate from the time you took delivery of your first press)
n = 298

Type of Inkjet Device(s) Owned



Q: What types of production inkjet device(s) do you currently own? (choose all that apply) (Do not include wide-format printing equipment.)
n = 298

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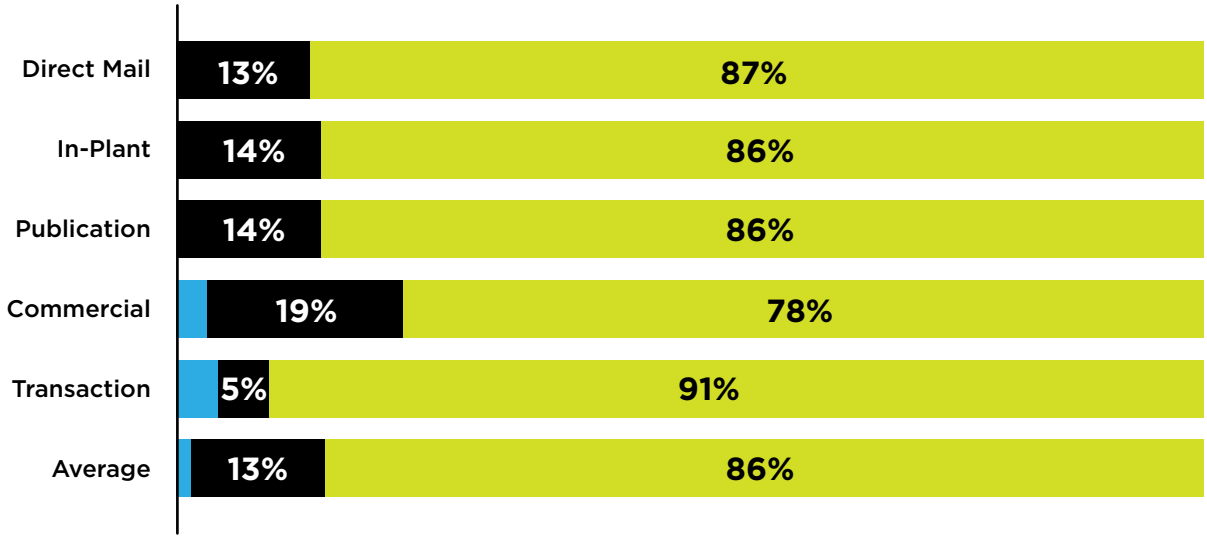
- **Overall Satisfaction**

  Printers in all segments reported very high levels of satisfaction moving to production inkjet with 86% of printers reporting they were Satisfied or Very Satisfied. When Neutral responses were included, the percentage grew to 99%. In addition to this high level of overall satisfaction Direct Mail, In-Plant, and Publication reported no Dissatisfaction at all. Further emphasizing the Satisfaction printers found, Commercial and Transaction were the only segments reporting any level of dissatisfaction at 3% and 4% respectively.

  Some comments participants had during phone interviews embellish some of what these numbers represent.

  - Inkjet saved our shop. Glad we can say that (In-Plant Printer)
  - Expectations were met—product quality, efficiency, speed, all the things they identified they've benefitted from (Bob White, Wolverine Solutions Group)
  - So satisfied we're looking at adding a second line at some point (Mike Lincoln, State of Colorado)

Overall Satisfaction Moving to Inkjet



Q: How satisfied are you overall with your move into production inkjet printing?
n = 201

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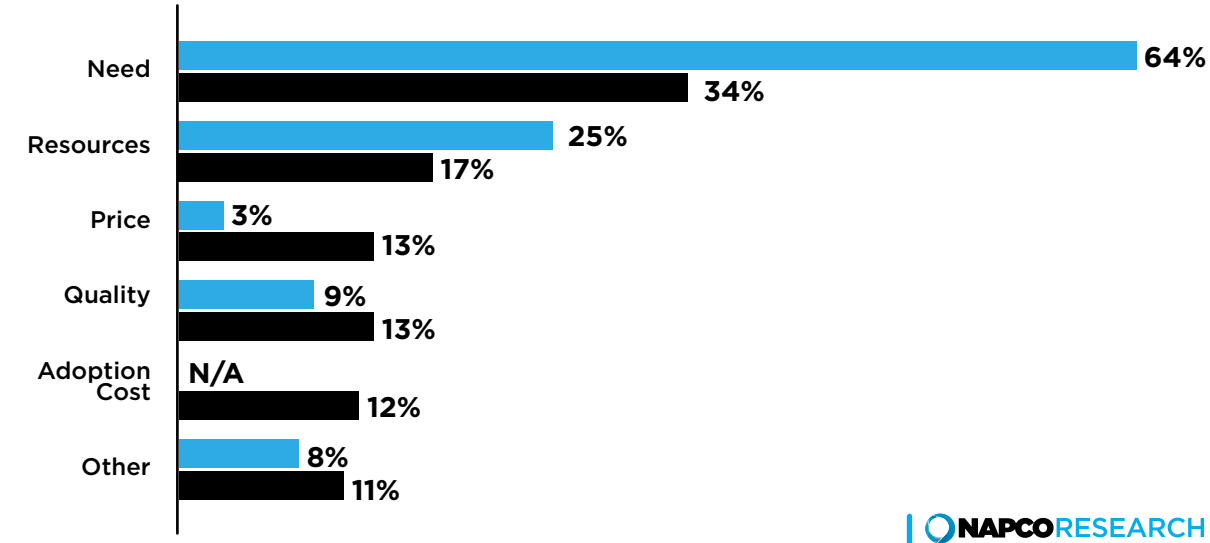
- **Reasons for NOT Owning and NOT Considering a Production Inkjet Press**
  'Need' was selected more than twice as often as any other reason for NOT Considering or NOT Owning a production inkjet press. The graphs below show the average results for all segments and the highest reasons by segment. As the second graph shows, the only exception to Need not being the highest selected reason for NOT Owning inkjet was with Direct Mail, where Quality was selected more often. Publication printers, selected Need the highest reason for not owning a production inkjet press, but a reason that scored equally as high as Need was Price with both being selected by 23% of respondents.

Segment Average



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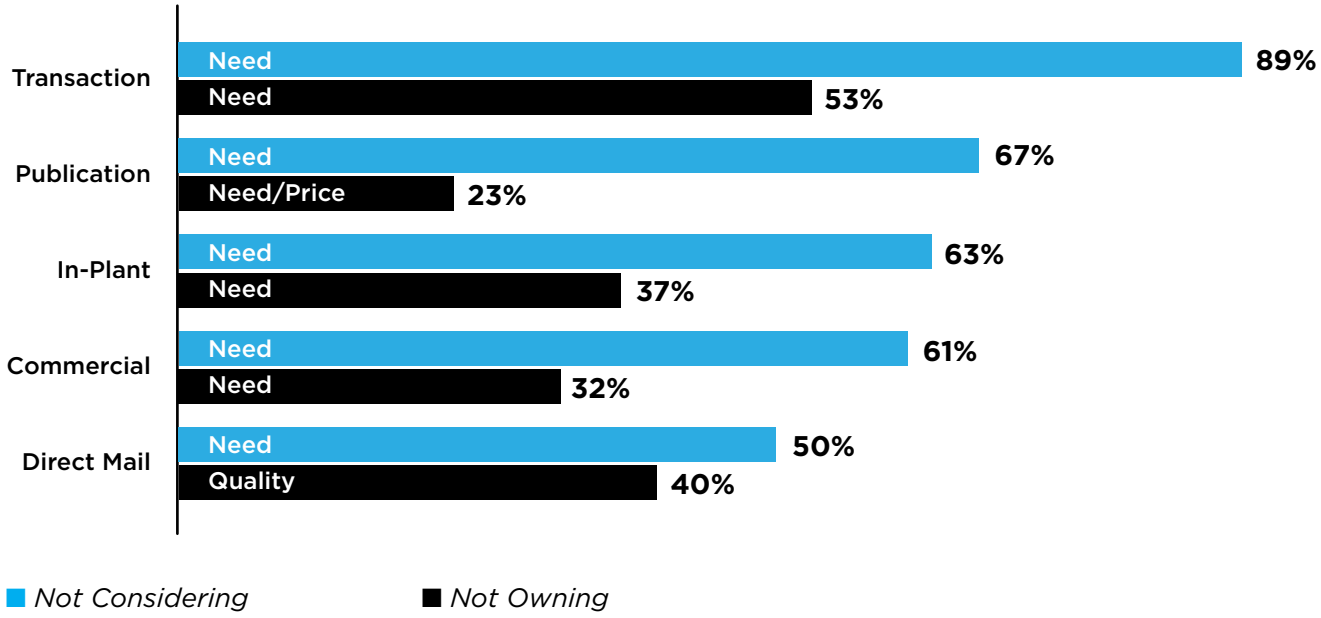
Segments Highest Reasons



Q: Which of the following best describe the reason(s) you do NOT own a production inkjet press? (choose all that apply)
n=286
Q: Which of the following best describes the reason(s) you are NOT considering purchasing a production inkjet press? (choose all that apply)
n=74

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Other reasons mentioned for Not Owning and Not Considering a production inkjet press by segment included:

NOT **OWNING**	

• **Equipment / Technology**
  • Don't have the space for more equipment
  • Reliability, service, and support concerns
  • Need expensive finishing and upgrades in other departments
• **Volume**
  • Not enough volume to purchase
  • Not yet in line with target audience
	• **Paper**
	  • Doesn't print on enough different stocks
	  • Can't run mixed media at rated speeds
	  • Insufficient quality and available sizes
	• **Other**
	  • Not at the end of toner lease
	  • Need data on workflow
	  • Need to get key players on board with quality and personalization

NOT **CONSIDERING**	
• **Just purchased our second. Need to fill that press before buying another**	• **We lease, not purchase** • **Outsourcing**

3. Pre-Purchase

- **Decision Drivers**
  Key decision drivers in considering production inkjet varied widely, with no identifiable stand-out driver(s) across segments. Top reasons by segment included:

  - Commercial: Increased Job Volumes / Smaller Print Runs
  - Direct Mail: More Personalization / Variable Data / Versioning
  - In-plants: Faster Run Speeds
  - Publication: Increased Job Volumes / Smaller Print Runs
  - Transaction: Workflow Efficiency Gains

- **Purchase Drivers**
  Final purchase drivers also varied among segments but had more segments sharing similar drivers. Top final decision drivers included:

  - Commercial: Customer Support; Equipment Durability
  - Direct Mail: Customer Support; Press Speed / Productivity; Purchase Price
  - In-plants: Price to Operate / Maintain; Brand Name / Reputation
  - Publication: Price to Operate / Maintain; Quality of Printed Output
  - Transaction: Price to Operate / Maintain; Quality of Printed Output

- **Top OEMs Evaluated, Considered or Planning to Evaluate**
  The production inkjet press manufacturers selected most often by the respondents as those they Evaluated, Considered, or Planned to Evaluate included four standouts; Canon/Océ, HP, Ricoh, and Xerox, with each segment identifying at least three of these four among their top four OEMs.

- **Due Diligence**
  The due diligence methods printers found most beneficial in adopting production inkjet, across all segments, was in attending relevant industry events and determining the total cost of ownership.

- **Time from Research to Purchase**
  The time printers spent from research to purchase of production inkjet devices overall was relatively evenly divided between three groups: less than six months, six to 12 months, and more than 12 months. However, there were notable variations in the proportion between market segments. For example, in the Direct Mail space, more than half of these printers took more than 12 months and most of the rest took less than six months, with very few Direct Mail printers taking six to 12 months.

4. Post-Purchase

- **ROI Calculations / Expectations**
  Printers across all segments used a Cost per Page and/or Total Cost of Ownership analysis to determine their Return on Investment (ROI) for production inkjet. Printers surveyed also reported that their ROI expectations were met or exceeded 85% of the time.

- **Experience Deploying**
  Printers' experience deploying inkjet was positive, with 80% of them reporting that the process went as expected or was easier or much easier than expected.

- **Deployment Challenges**
  Paper compatibility was a challenge that most printers faced with inkjet deployment. Other deployment challenges multiple segments reported included having sufficient print volumes to keep their inkjet press at capacity and finding out that the print quality didn't meet their customers' expectations.

- **Sales Training**
  To help clients understand inkjet's capabilities and benefits, sales staffs needed to be trained. The majority of printers implemented sales training by developing internal training programs, followed by OEM on-site and in-field sales training as the next most relied upon type of sales training.

5. Impact

- **Work Migration and New Business**
  New business and existing work migrated from digital toner and offset presses accounted for more than 75% of production inkjet volume across all of the market segments.

- **Applications Deployed**
  The applications most commonly deployed on inkjet closely followed the work each segment was known for. Beyond that, Direct Mail was the most commonly cited new inkjet application deployed among the segments.

- **Client Response**
  About a third of print clients, across the market segments, embraced production inkjet immediately, were indifferent, or did not notice a change. Another third embraced it after seeing the cost savings that could be achieved, and about 10% viewed inkjet as an opportunity to create new applications or products, generally reflecting a high level of acceptance of the technology. The remaining quarter of clients were skeptical or needed to move their quality expectations from 'offset' quality to 'acceptable' quality in order to accept the move of their work to inkjet.

RECOMMENDATIONS

Recommendations for OEMs, Suppliers, and Printers on how this research may help with future business decisions are presented below.

1. OEMs

Half of the printers surveyed already own production inkjet equipment, indicating the large base of potential customers that still exist. Likewise, printers with inkjet presses are strong candidates for additional or replacement inkjet devices at some point in the future. The market availability of more and improved cut-sheet inkjet models, which have lower price points and volume requirements, also opens up new inkjet opportunities. This will be true for several of the market segments, but especially for Commercial and In-plant printers seeking lower TCO and higher press uptimes in comparison to their existing dry and liquid toner-based cut-sheet digital presses.

INKJET OWNERS AND NON-OWNERS

Ways OEMs could help both existing inkjet owners and future owners navigate the inkjet decision and implementation process would be to do a better job at the due diligence stages, provide greater assistance with deployment of their customer's inkjet equipment, and foster stronger partnership relationships with the printers. This is not to say OEMs are not providing these services today but, based on this research, additional support may be helpful in these areas.

- **Conducting Due Diligence:** Printers found attending industry events, determining the total cost of ownership, having OEMs run customer files on customer papers in their demo centers, and networking with peers in similar market segments already running inkjet equipment, to be very effective forms of due diligence. To help customers with each of these, OEMs may consider:

  a. Inviting customers and prospects to industry events such as relevant trade shows, conferences, open houses and user group meetings, to demonstrate differentiation from other OEMs when it comes to technology, in-field service, training, market development and customer support levels, and to foster education and peer-to-peer networking.

  b. Offering printers concise and thorough Cost per Page and Total Cost of Ownership analysis — the two most selected forms of analysis by inkjet owners. When running this analysis, printers find it challenging to identify all of their equipment, maintenance, and service costs, as well as related cost factors such as electrical usage. They also struggle in determining overall workflow requirements, including pre- and post-press; availability and suitability of various paper grades; ink consumption/costs based on typical coverage; and ink/paper combinations.

  c. Offering to print customer-provided files on the printer's specific paper stocks at OEM demo centers helps printers see 'real world' equipment output results. This also provides opportunities for both OEMs and their partner suppliers to identify potential challenges with pre- and post-processing, paper selection, color gamut, quality expectations, etc.

  d. Providing peer contacts and arranging site visits to existing customers in the same market verticals, so prospects can talk one-on-one with existing inkjet press users running similar work to visually see the equipment running in an actual production environment; hear what the user's experience has been with it, including any issues they might have had with paper, ink, color matching, maintenance, finishing and customer acceptance; as well as learn about any other problems they may have encountered.

- **Assisting with Inkjet Deployment:** Challenges printers had deploying inkjet equipment that OEMs may be able to help with included paper compatibility/linearization, pricing strategy, finishing, market application development and sales training. To help customers with each of these, OEMs should:

  a. Continue to certify/qualify and profile paper grades that run well on their presses. Continue R&D efforts to develop ink sets that are compatible with standard offset grades. Work with paper suppliers to identify treated and untreated inkjet papers that address printer color reproduction, press runnability, and high-speed post-processing applications, prior to installation — which was cited as the largest challenge faced by 40% of the survey respondents when they deployed inkjet.

  b. Help printers develop inkjet-pricing models that address the differences between their existing toner and offset models is a challenge 30% of printers identified. Without an inkjet pricing model, estimating jobs is difficult due to the different workflows, material costs, and ink consumption requirements. Work done during due diligence may help with this, but more assistance would be helpful so printers could be operational-ready once the press is installed.

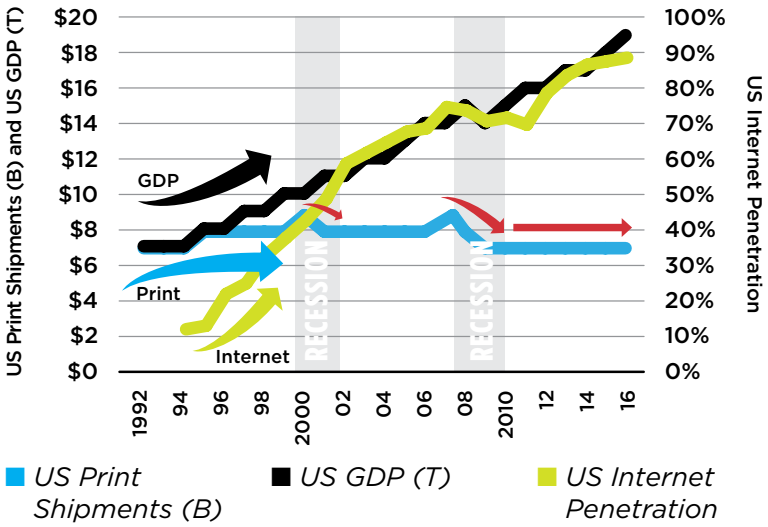
  c. Help printers understand finishing impact. Finishing was identified by more than 40% of the respondents as being the largest workflow change they need to make with production inkjet adoption. Having an understanding of how inkjet affects finishing requirements and preparing printers for these workflow changes will help with inkjet's implementation.

  d. Provide Sales Training: Printers used internally developed sales training more than twice as often as any other form of training, except for OEM onsite/in-field training, which was used about three quarters as often as internal training. Proper sales training is critical in communicating inkjet's benefits to print buyers, marketers and brand owners. Some printers have created/partnered with agencies and hired sales specialists with marketing backgrounds to sell their digital printing services because they understand omnichannel marketing, which is how print is increasingly being used as part of the overall mix. OEMs could help with this by providing more educational materials on inkjet technologies and capabilities, and/or by partnering with training or marketing organizations to offer turnkey training covering both the technology and how production inkjet helps drive omnichannel marketing campaigns.

- **OEM Fostered Partnerships:** OEMs could benefit from positioning themselves as printer partners, by working towards developing longer-term relationships with printers. As the market continues to mature, building and retaining customers will become an ever-increasing challenge. By partnering with printers to cultivate their capability, and by helping them increase the awareness of inkjet capabilities with their downstream brand manager/marketer/print buyer clients, both OEMs and printers will be better positioned to maintain and grow their businesses.

- As the graph shows, print shipment values were negatively impacted when the Internet began being used by individuals and businesses in the mid to late 1990s and then during each of the following recessions. Since the end of the Great Recession in 2009, print shipment values have been relatively flat, indicating the need to prove the value and ROI that print delivers to brand owners will become increasingly important. Inkjet is particularly well positioned to deliver this value proposition. By partnering with printers, OEMs can help facilitate brand owner understanding of inkjet's personalization, micro-targeting, versioning, short-run, on-demand and running cost advantage capabilities, to the benefit of the brand owner, printer, OEM, and the overall print industry.

US Print Shipments, GDP and Internet Penetration



Sources: Federal Reserve Economic Research / US Print Shipment Values (A23SVS) and US GDP Internet Live Stats / US Internet Penetration

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NON-INKJET OWNERS

Lack of Need was the single largest reason printers gave for not owning or considering production inkjet, accounting for 70% of the reasons for not considering inkjet and 40% of the reasons for not owning a press — at least twice as much as any other reason. Given the significant percentage of non-buyers citing Lack of Need as the reason for not purchasing and the significant benefits the industry acknowledges that inkjet adoption provides, this strongly indicates that there is an awareness gap about the advantages inkjet provides among those printers at the not planning to purchase level.

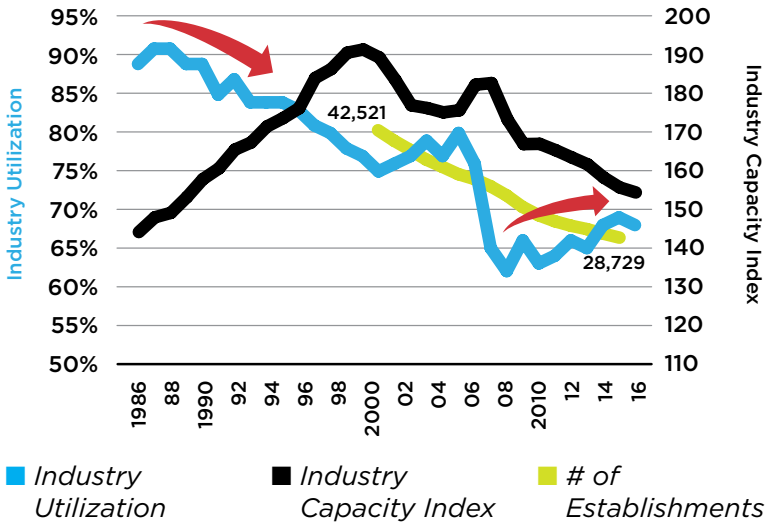
This may represent an opportunity for OEMs to help educate printers about the benefits of inkjet, including the opportunity to branch into new applications, lower operating costs and higher speeds. Some 'need'-based objections OEMs may face include: printers' unwillingness to invest, printers not seeing what benefit inkjet capabilities could deliver or if their clients would accept its output, and printers not having sufficient volumes to justify an inkjet press installation.

- **Unwilling to Invest:** Print owners nearing the end of their working careers, which constitutes many shops, may not be willing to invest in inkjet or go through its implementation because they are biding their time until they retire and/or sell their business. An approach an OEM could take with an owner planning to retire or sell their business would be to demonstrate how an inkjet press could increase the overall value and sales multiples for their business in an M&A transaction. The owner may not personally realize the print benefits inkjet offers, but may benefit from it financially by increasing its attractiveness to potential buyers.

- **Printer Benefit / Client Acceptance:** Printers not believing their business would benefit from inkjet or who are concerned their customers would not accept its output quality could benefit from educational programs, materials and case histories that identify the positive results for printers and by talking with print clients in their segment who have inkjet experience. By offering printers educational programs along with printer references, prospective buyers could become more aware of how their business could benefit from inkjet. As for print client response to inkjet output, printers reported their clients Embraced Production Inkjet Immediately, Embraced it After Seeing Cost Savings, Were Indifferent Towards It or Didn't Notice a Difference 60% of the time. This bears out how inkjet received broad and rapid acceptance among print clients. Additionally, 13% of current inkjet press users Created New Applications or Products that resulted in additional positive responses from their print clients, bringing the total level of positive responses to 73%.

- **Insufficient Print Volume:** Printers may not believe they have sufficient volumes and demand for variable printing to justify an inkjet press, given the speeds and high uptimes these presses are capable of achieving. This perspective may be based on the printer's belief that print utilization needs to be a particular, likely historic, number. Help printers understand the industry's print utilization rate, calculated monthly by the Federal Reserve, which reached its all-time high of close to 90% in the late 1980s, before the advent of digital printing and the introduction of the Internet. We live in a very different world today as the chart to the right shows. Industry utilization, print capacity, and the number of print establishments have changed significantly since then, making historic values no longer relevant. The current utilization rate of about 67% is also not a valid inkjet benchmark because it includes offset and other types of print. Given the speed and workflow efficiency of production inkjet, a print utilization rate of 30% to 40% is a more meaningful benchmark to measure against. The possible hidden benefit of a printer's desire for more historic utilization rates may actually be that it encourages them to seek new business for their inkjet press. About a quarter of inkjet print volume across segments comes from new business, providing additional reasons for printers to seriously investigate production inkjet printing.

US Utilization, Capacity & Establishments



Source: US Federal Reserve (NACIS=323): Utilization and Capacity Bureau of Labor Statistics: Number of Print Establishments

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2. Suppliers

The single largest challenge printers faced deploying inkjet was paper compatibility. One survey participant summed up what printers need this way: "Finding quality paper, at a competitive price, in different thicknesses, that ideally were 'authorized' and similar to or the same as standard offset paper, and that achieve good, saleable results.' OEMs must continue to work with paper mills and merchants to identify and/or certify papers that run well on their equipment.

OEMs also must continue R&D and lab testing efforts to develop improved ink sets and to determine ink/paper combinations and profiles that work best on their inkjet equipment. Confidence that there are a wide range of well-tested and/or certified, affordable and compatible papers and inks available for an OEM's inkjet press equipment, assures printers that their transition to inkjet or their deployment of a new press will go smoothly and eliminates one of the primary challenges that they face today.

3. Printers

Production inkjet ownership among respondents was split with half of surveyed printers owning a production inkjet press and the other half not owning one primarily because they didn't identify a need for one.

Of the printers owning an inkjet press, 75% of the work they were running came from new business, or from work migrated from their digital toner and offset presses. Eighty-five percent of printers operating an inkjet device were Satisfied or Very Satisfied with their press, primarily due to its ability to generate new business, reduce per job costs, and deliver consistent color. Also, client acceptance of inkjet output was high, with about half of clients embracing inkjet immediately or after seeing the cost savings; about 10% were indifferent or didn't notice their work was run on an inkjet press.

From these findings, printers that have not acquired inkjet printing capabilities would be advised to identify why their business and their customers would not benefit from inkjet's capabilities, before definitively deciding against an inkjet press investment. Otherwise, they may find themselves increasingly at a competitive disadvantage with competitors who have this capability and thus are further along the learning curve.

CONCLUSION

Production inkjet printing is the most rapidly expanding, game-changing technology available in the market. Among the survey respondents who have adopted inkjet, about half of them have utilized it for more than three years, indicating it is an established print technology and one with a high level of overall user satisfaction, given that 85% of printers reported they were Satisfied or Very Satisfied with their inkjet press.

Factors printers considered when deciding to move to inkjet included increased efficiencies, faster run speeds, more personalization capabilities, and the ability to handle smaller print runs. When deciding on which press to buy, printers were guided by brand reputation; purchase price; customer sales, service, training and market development support; equipment durability; productivity and upgradability, TCO calculations, and the quality of the printed output.

Printers did face challenges deploying inkjet as a result of issues with paper options, workflow requirements, finishing bottlenecks, ability of their salespeople to promote inkjet's value proposition, etc. But, with that said, 80% found deploying inkjet went As Expected, Was Easier, or Much Easier Than Expected. Printers also reported their clients Embraced Production Inkjet Immediately, Embraced it After Seeing Cost Saving, Were Indifferent or Didn't Notice 60% of the time, making quality output concerns among customers less of an issue than many might have expected initially. An additional 13% of printers Created New Applications Products, resulting in additional positive responses, bringing the total level of positive client responses to 73%.

RESEARCH FINDINGS

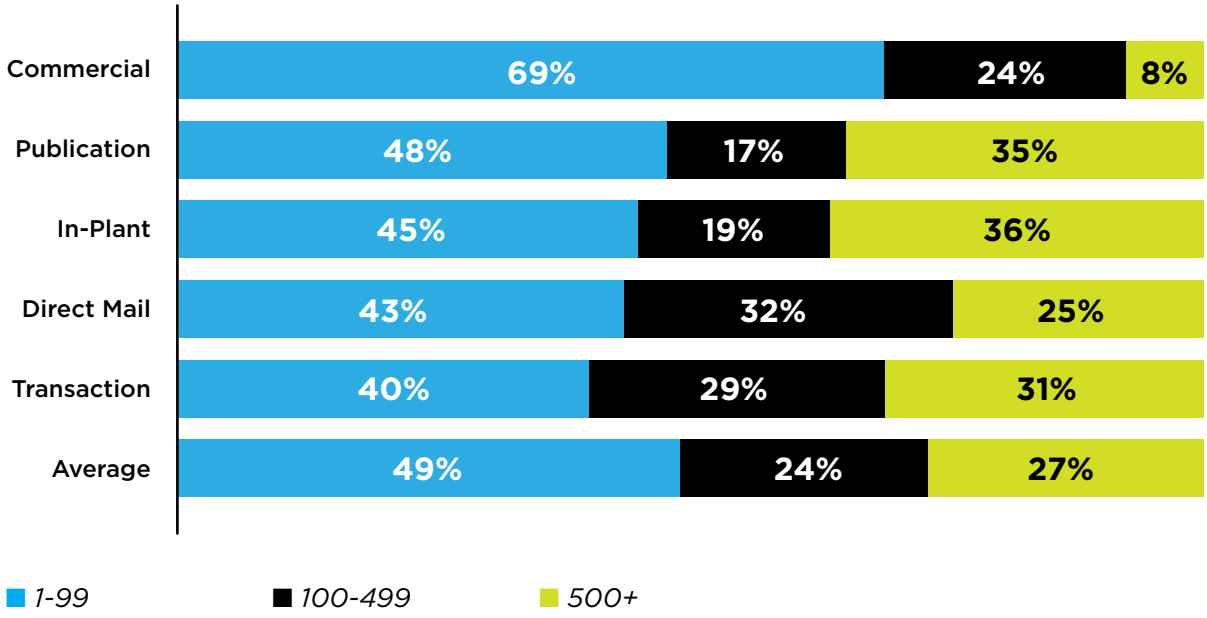
For multiple-choice questions, segment responses are listed as the percent of respondents selecting each choice, along with an overall average of all segments to provide a collective response and a point of comparison showing how each segment compares with the group. All responses are graphed with notable findings highlighted, followed by the question as it was asked in the survey and the total number of responses (n) for each question.

1. Printer Profile

To provide a profile of the printers surveyed, participants were asked to identify the number of employees at all of their company locations and their annual revenue. The results from these questions clustered into three groups:

- Small: less than 100 employees and less than $10 million in revenue
- Mid-Size: 100 to 499 employee and $10 to $50 million in revenue
- Large: 500+ employees and $50+ million in revenue

Company Employment (All Locations)



Q: Including yourself, how many people are employed at all your companies' locations (For classification purposes only)
n=669

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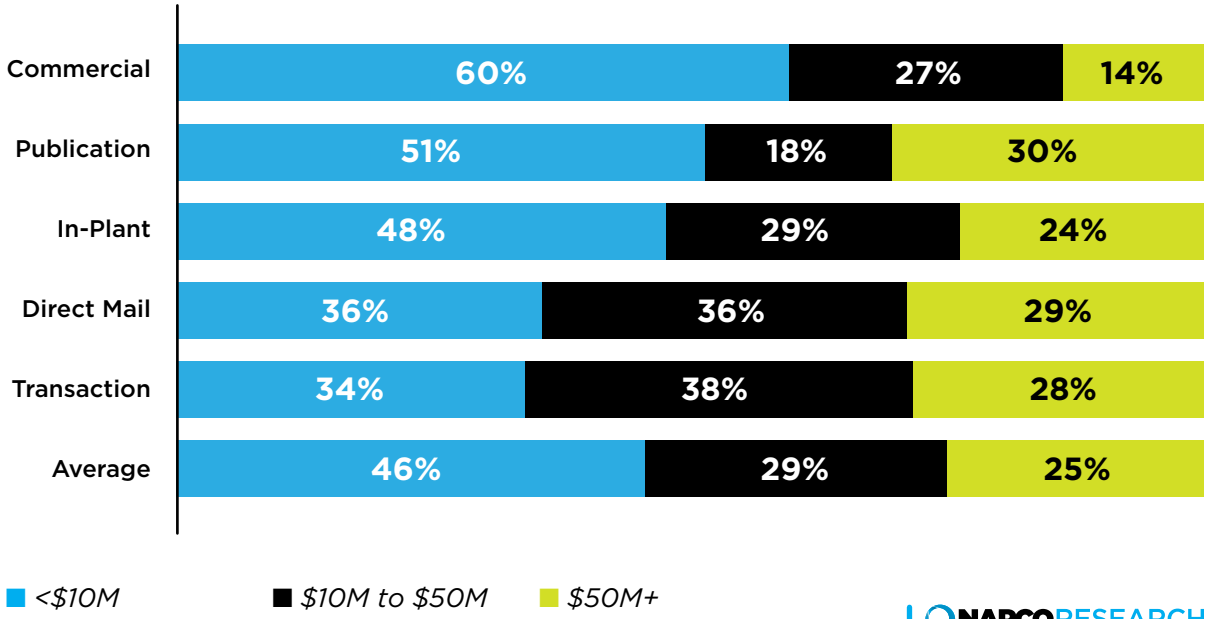
Company Annual Revenue



Q: What is your company's annual revenue? (For classification purposes only)
n=669

About half of surveyed printers had fewer than 100 employees and annual revenues under $10 million, with the other half relatively evenly divided between mid-size and large organizations. Between 25% and 35% of In-plant, Publication, Transaction, and Direct Mail printers had 500+ employees and annual revenues greater than $50 million, and about 10% of Commercial printers had operations of this size.

2. Ownership

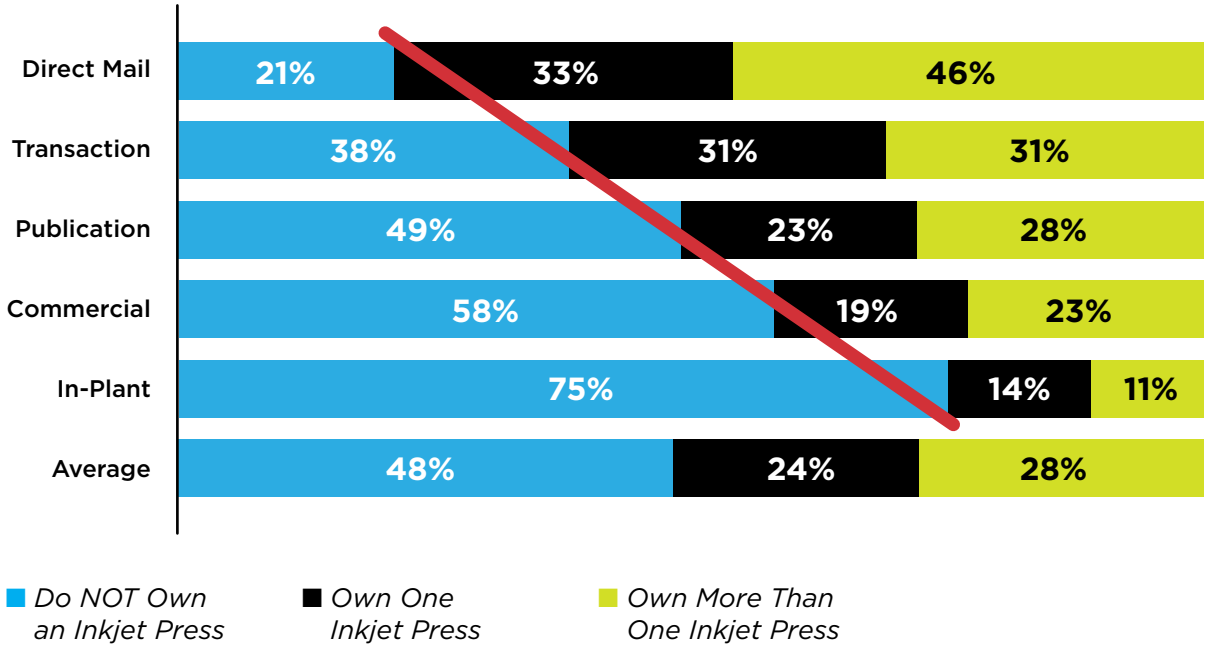
CURRENT OWNERSHIP

Half of printers own at least one production inkjet press. The segment with the largest ownership was Direct Mail at 79% and the smallest was In-plant at 25%. Other segment ownership rates were fairly uniformly distributed between these extremes as illustrated by the diagonal line in the graph below.

LIKELIHOOD OF BUYING

On average, 40% of printers were Somewhat or Very Likely to buy a production inkjet press next year, with Direct Mail shops the most likely at 61% and In-plant operations the least likely at 26%, again representing the most and least likely segments as they did with current ownership. The likelihood of the other segments to buy were all clustered around 40%.

Current Inkjet Ownership



Q: How would you describe your current production inkjet printing capabilities? (Do not include wide-format equipment as this is not the focus of this survey.)
n = 709

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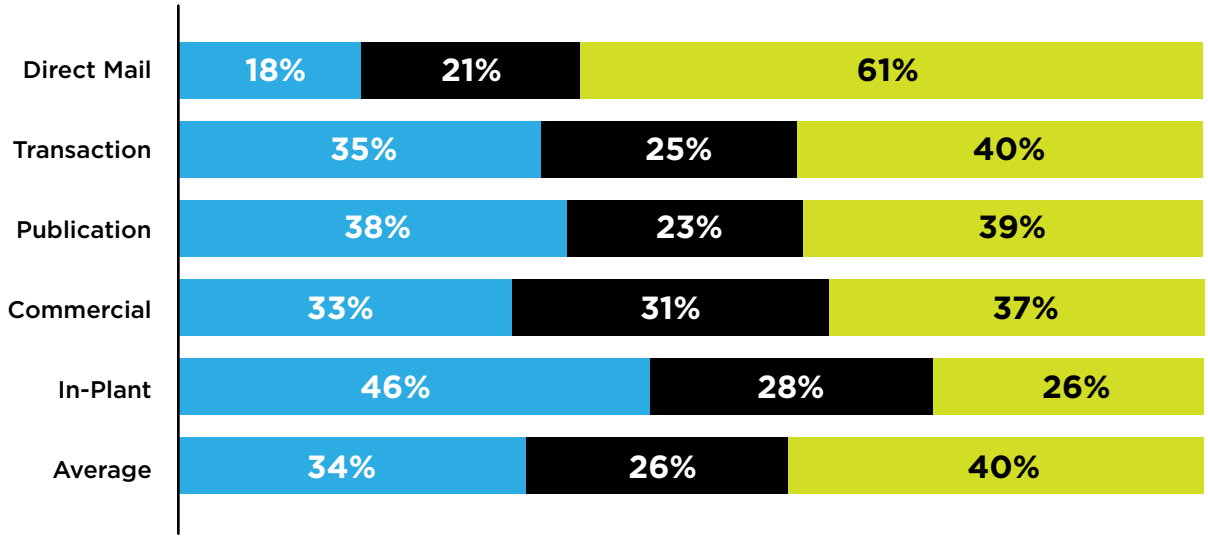
Likelihood of Buying Inkjet Next Year



Q: How likely are you to make a production inkjet press purchase in the next year?
n = 696

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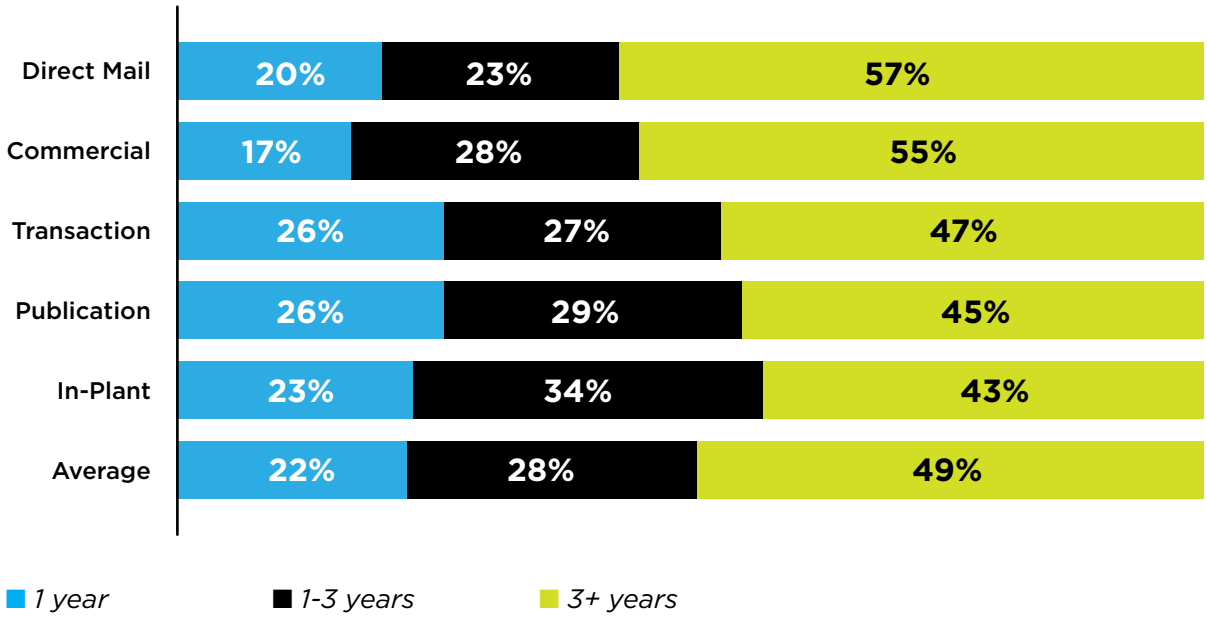
TIME OWNING PRODUCTION INKJET EQUIPMENT

About 80% of printers with inkjet equipment have owned it for a year or more and 50%+ have owned it for more than three years. The segments showing the longest usage rates were Direct Mail and Commercial, with the other three segments — Transaction, Publication, and In-Plant — all following closely behind.

INKJET DEVICE(S) OWNED

Segments generally showed a preference between owning continuous-feed or cut-sheet inkjet presses, but not to the exclusion of the other press types. Publication and Direct Mail printers showed a clear preference towards continuous-feed presses, with each having a 75+% ownership rate — far more than any of the other segments. Commercial and In-plant printers had a preference towards cut-sheet models, with both reporting 64% ownership, and with both also having the smallest ownership rate of continuous-feed presses, at about 50%. Overall, there was a somewhat higher ownership rate for continuous-feed presses, at 62%, than cut-sheet presses at 55%, leading one to conclude there are solid markets for both types of presses, but there tends to be a preference for one type over another depending on the segment and their print applications.

Time Owning Production Inkjet



Q: For how long have you had your production inkjet equipment?(If you own more than one, calculate from the time you took delivery of your first press)
n = 298

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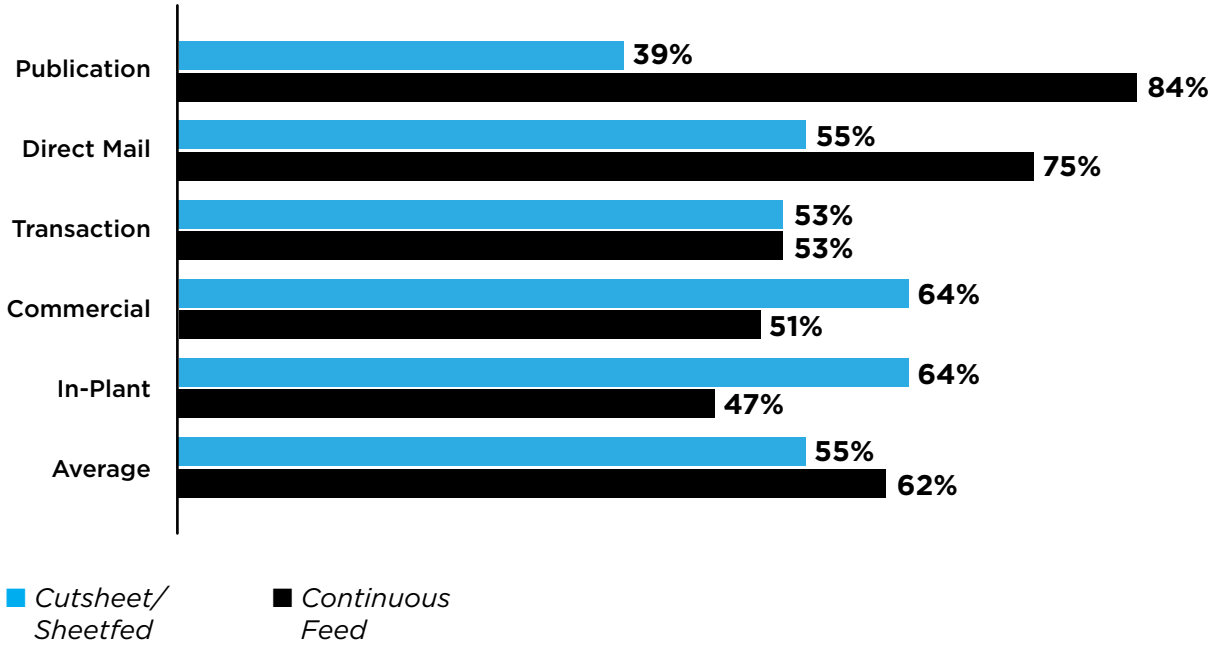
Type of Inkjet Device(s) Owned



Q: What types of production inkjet device(s) do you currently own? (choose all that apply) (Do not include wide-format printing equipment.)
n = 298

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OVERALL SATISFACTION

Printers in all segments reported very high levels of satisfaction moving to production inkjet with 86% of printers reporting they were Satisfied or Very Satisfied. When Neutral responses were included, the percentage grew to 99%. In addition to this high level of overall satisfaction Direct Mail, In-plant, and Publication respondents reported no Dissatisfaction at all. Further emphasizing the Satisfaction printers found, Commercial and Transaction were the only segments reporting any level of dissatisfaction at 3% and 4%, respectively.

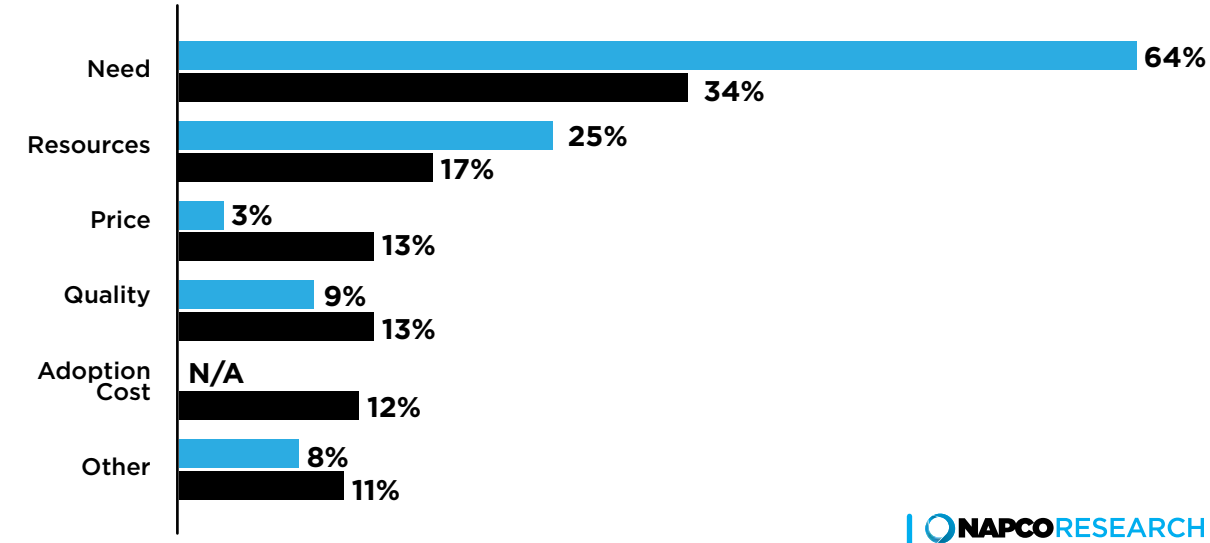
Some comments participants had during phone interviews embellish some of what these numbers represent.

- "Inkjet saved our shop. Glad we can say that." (In-plant Printer)
- "Expectations were met—product quality, efficiency, speed, all the things they identified we've benefitted from." (Bob White, Wolverine Solutions Group)
- "So satisfied, we're looking at adding a second line at some point." (Mike Lincoln, State of Colorado)

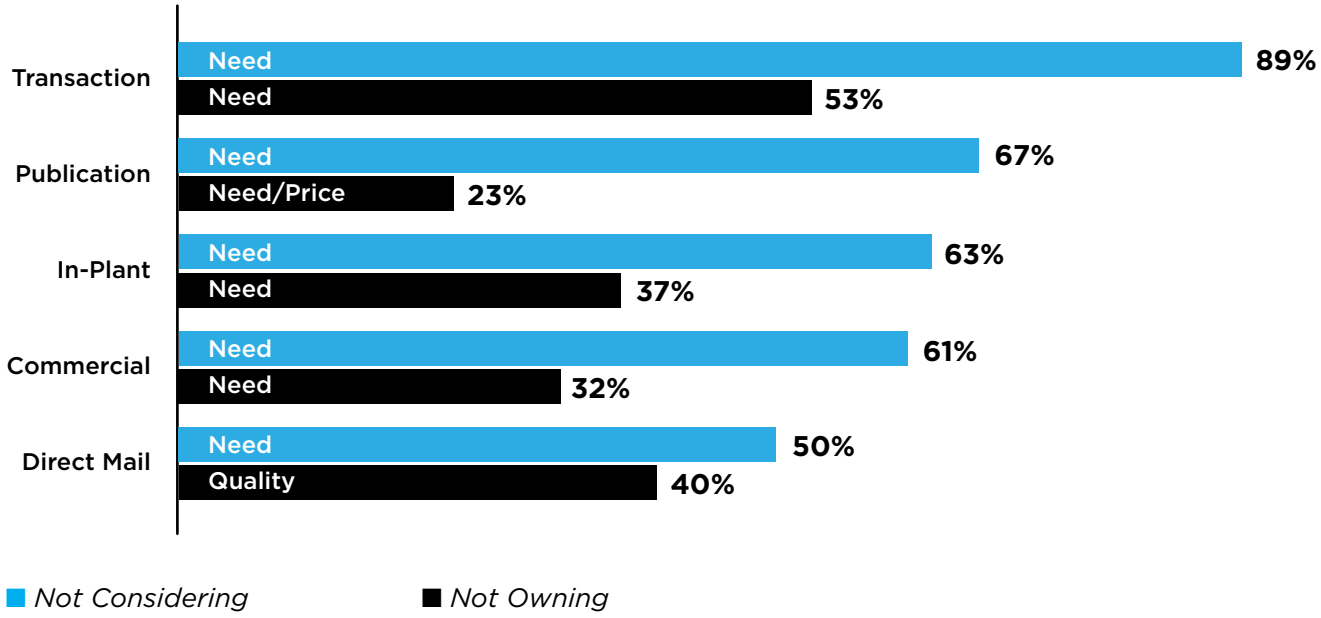
REASONS FOR NOT OWNING AND NOT CONSIDERING A PRODUCTION INKJET PRESS

'Need' was selected more than twice as often as any other reason for NOT Considering or NOT Owning a production inkjet press. The graphs below show the average results for all segments and the highest reasons by segment. As the second graph indicates, the only exception to Need being the highest selected reason for NOT Owning inkjet was with Direct Mail, where Quality was selected more often. Publication printers, selected Need the highest reason for not owning a production inkjet press, but a reason that scored equally as high as Need was Price with both being selected by 23% of respondents.

Segment Average



Segments Highest Reasons



Q: Which of the following best describe the reason(s) you do NOT own a production inkjet press? (choose all that apply)
n=286
Q: Which of the following best describes the reason(s) you are NOT considering purchasing a production inkjet press? (choose all that apply)
n=74

Other reasons mentioned for Not Owning and Not Considering a production inkjet press by segment included:

NOT **OWNING**	

• **Equipment / Technology**
  • Don't have the space for more equipment
  • Reliability, service, and support concerns
  • Need expensive finishing and upgrades in other departments
• **Volume**
  • Not enough volume to purchase
  • Not yet in line with target audience
	• **Paper**
	  • Doesn't print on enough different stocks
	  • Can't run mixed media at rated speeds
	  • Insufficient quality and available sizes
	• **Other**
	  • Not at the end of toner lease
	  • Need data on workflow
	  • Need to get key players on board with quality and personalization

NOT **CONSIDERING**	
• **Just purchased our second. Need to fill that press before buying another**	• **We lease, not purchase** • **Outsourcing**

3. Pre-Purchase

DECISION DRIVERS

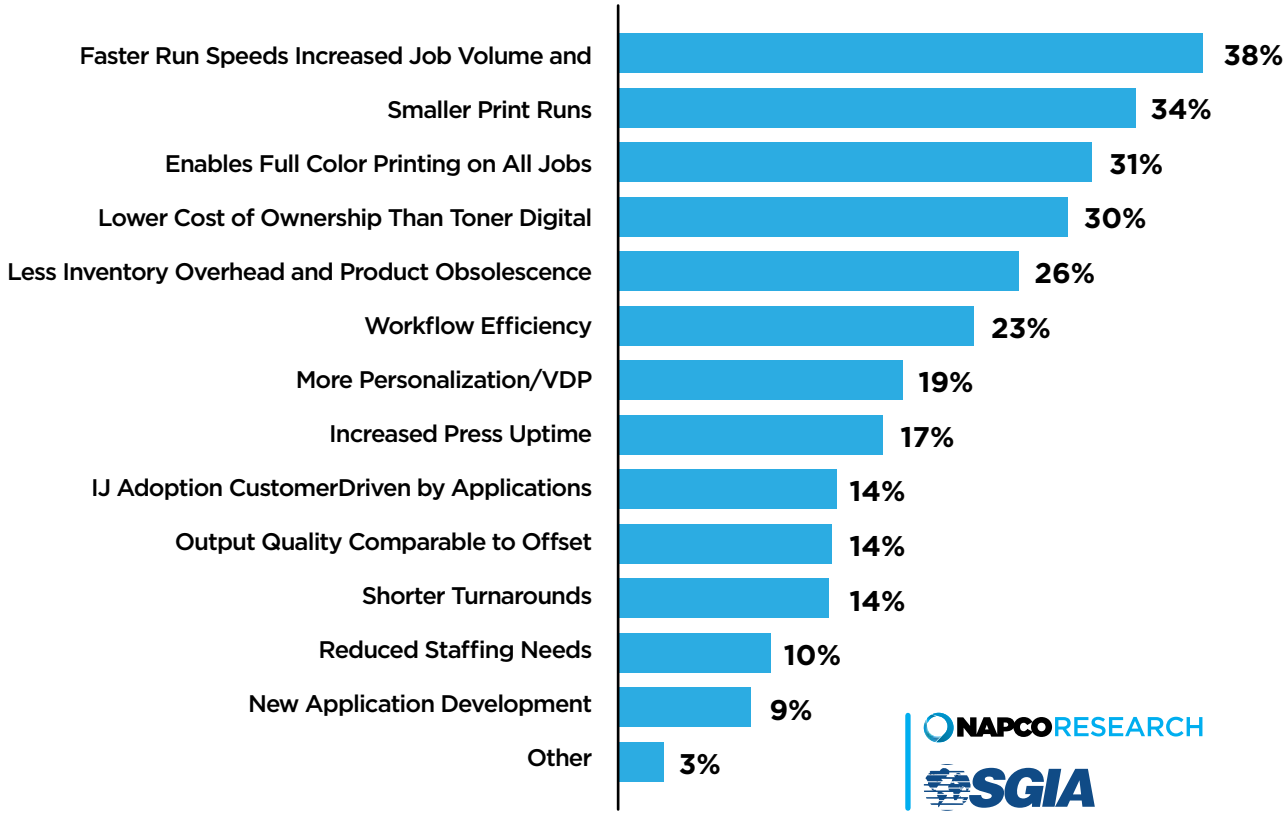
There was a host of decision drivers moving printers to production inkjet. The most frequently selected across all segments were:

- Faster Run Speeds
- Increased Job Volume and Smaller Print Runs
- Enables Full-Color Printing on All Jobs
- Lower Cost of Ownership than Toner Digital

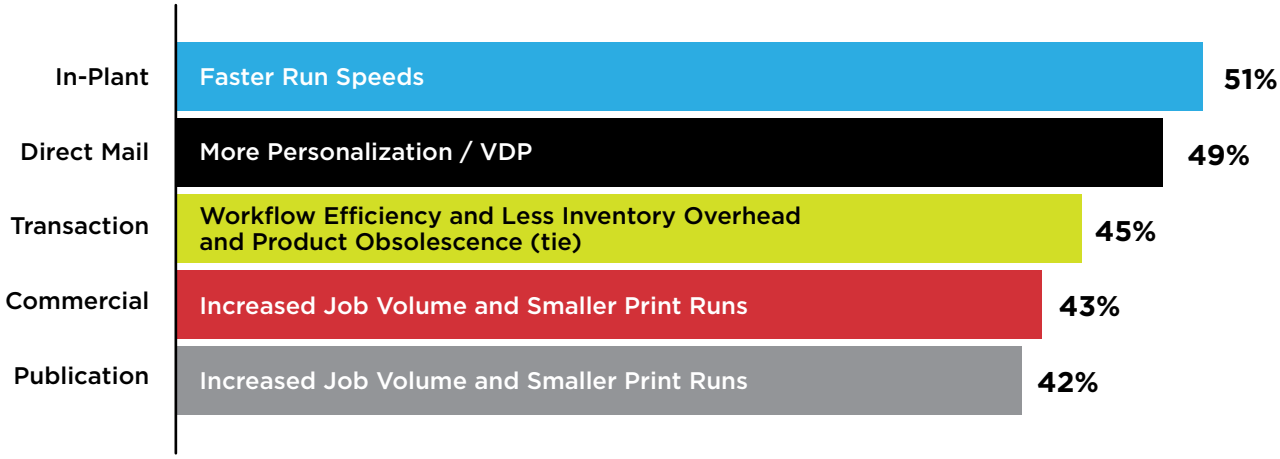
These and other decision drivers are graphed on the next page, with the second graph showing each segment's highest decision drivers.

KEY DECISION DRIVERS IN CONSIDERING PRODUCTION INKJET

Segment Average



Segments Highest Decision Driver



Q: What are the key drivers of your decision to consider production inkjet? (choose top 3)
n=344

Key decision drivers mentioned in the 'other' section included:

OTHER KEY DECISION DRIVER	
• **Quality and ability to print on different substrates**	• **New inks printing better on untreated stocks**
• **Works with Seed Paper**	• **Direct to container printing eliminates labels**
• **Ability to satisfy customers on an economical basis**	• **Only option to print on window envelopes**
	• **Volume**

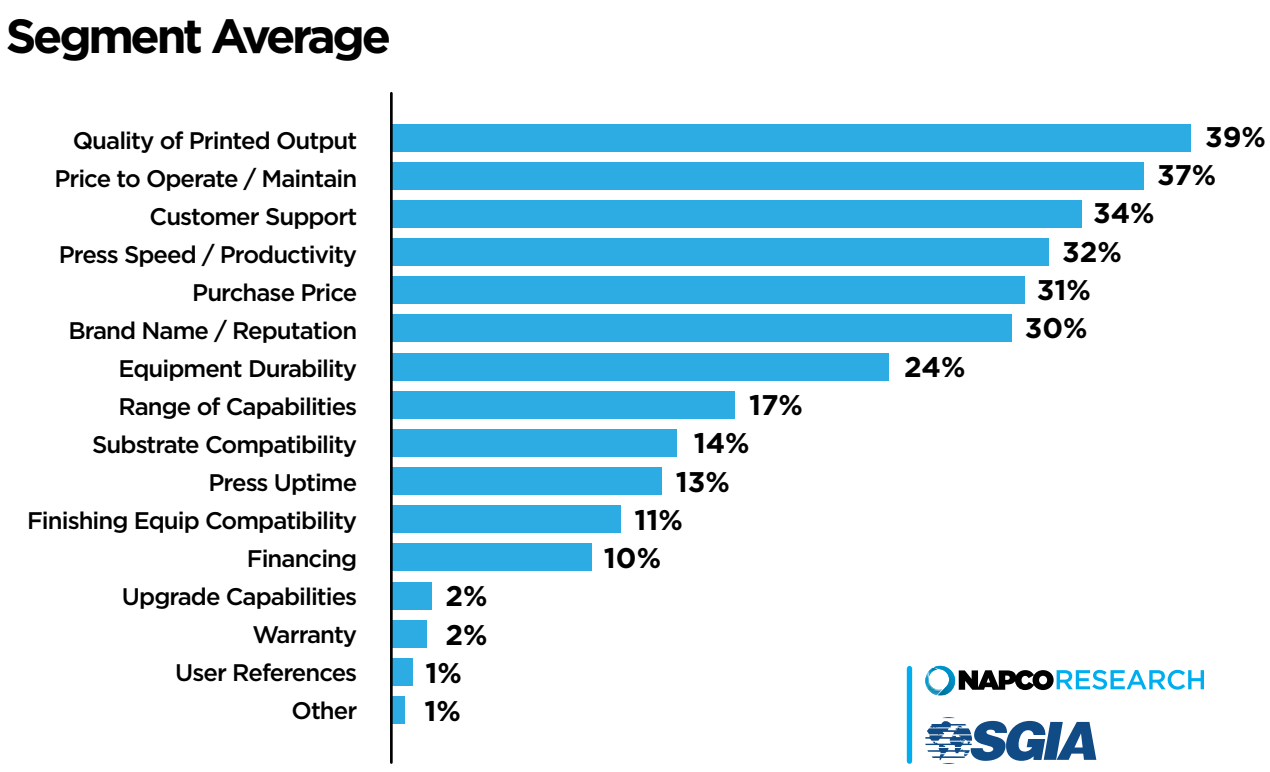
Comments printers made supporting this during phone interviews included:

- "By bringing in inkjet, we expanded our capacity and became competitive." (In-plant Printer)
- "Finding a more efficient way of producing short runs more quickly. With inkjet, it is night and day compared to offset." (Rick Lindemann, Total Printing Systems)
- "Our primary driver was reliability and the opportunity to move to some level of color. We replaced six boxes with one inkjet [press]." (Mike Lincoln, State of Colorado)

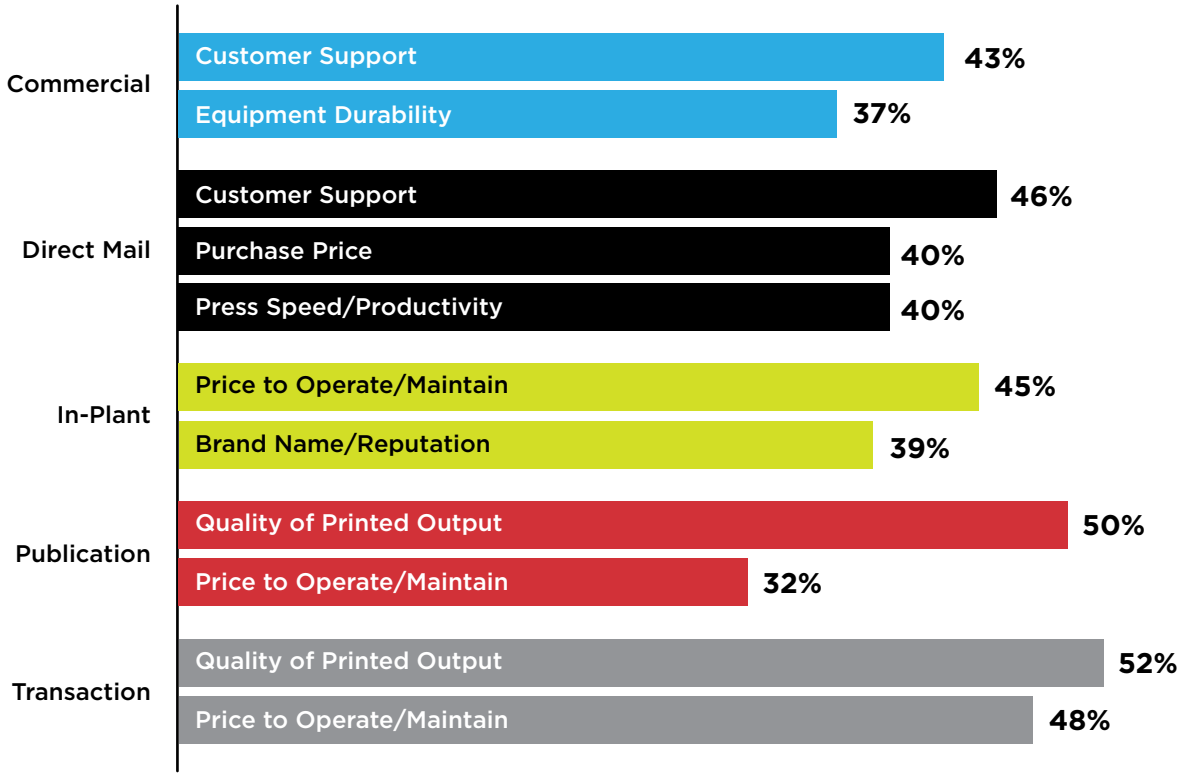
PURCHASE DRIVERS

After printers decided to acquire a production inkjet press, they needed to identify their main purchase drivers as part of the final purchase decision process. These drivers varied more widely than initial decision drivers, likely due to the increased significance of the decision and the different needs between the segments. The graph below identifies segment averages for each driver with the following graph showing the top two drivers of each segment.

TOP PURCHASE DRIVERS IN THE FINAL PRODUCTION INKJET PURCHASE DECISION



Segments Highest Purchase Driver



Q: When it came to your final purchase decision, what were your top three purchase drivers? (choose top 3)
n=233

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Survey participants and phone interviewees comments concerning purchase drivers included:

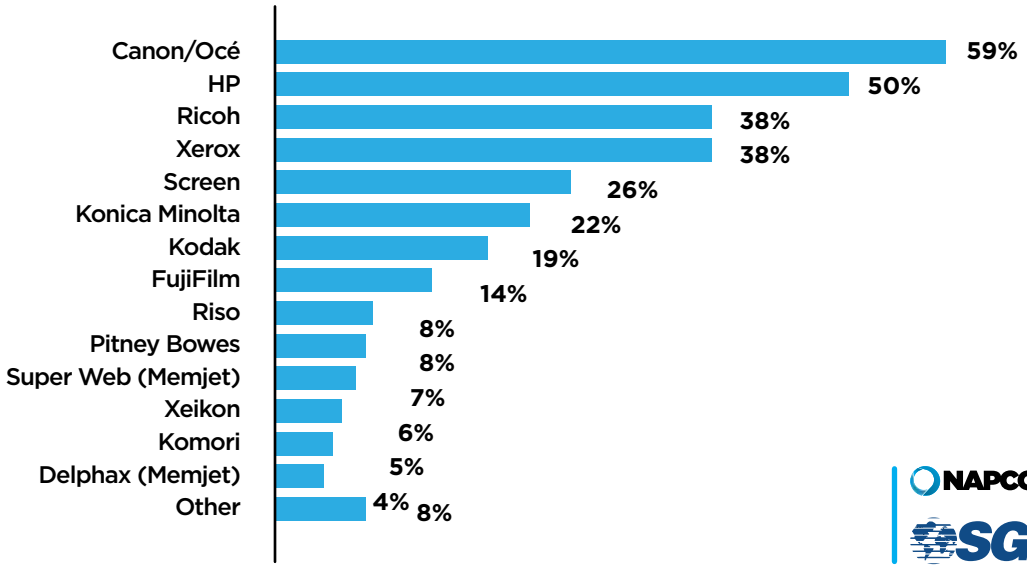
- "Saw increasing need from clients. Had three devices coming off lease. Visited peers running the equipment that had similar decision criteria. Purchase was driven by scalability, economics, and reputation." (Bob White, Wolverine Solutions Group)
- "A proven player, pricing, and then quality. Talked to their R&D people to see where they were going, visited customers to see presses in a real production environment, and talked to the people using the equipment." (Insurance Company)
- "Formed a well-versed internal team with knowledge and background of digital and offset print, finishing, and sales. This team was able to fully understand the needs, capabilities, and limitations of our workflows and allowed us to think outside the box." (Survey Participant)
- "Came down to ROI, period. They looked at the cost of the machine, the ink, production capability, and the factor that drove the decision was the ink kit that let them use commodity stocks in inventory." (Art Kunder, Tidewater Direct)

OEMs EVALUATED, CONSIDERED, OR PLANNED TO EVALUATE TO PURCHASE

The most frequently selected OEM brands were Canon/Océ, HP, Ricoh, and Xerox. The graphs below show the collective average of the segments for each OEM listed in the survey and the four highest OEMs selected by each segment.

OEMs EVALUATED, CONSIDERED, OR PLANNED TO EVALUATE TO PURCHASE

Segment Average



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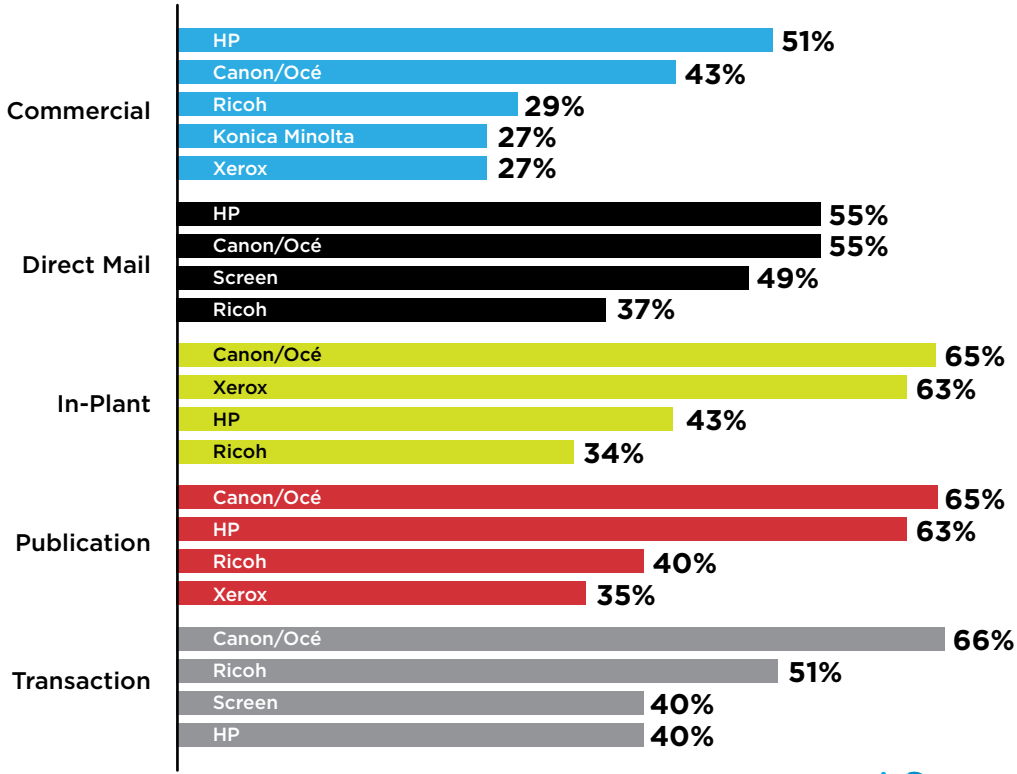
Segments Top OEMs



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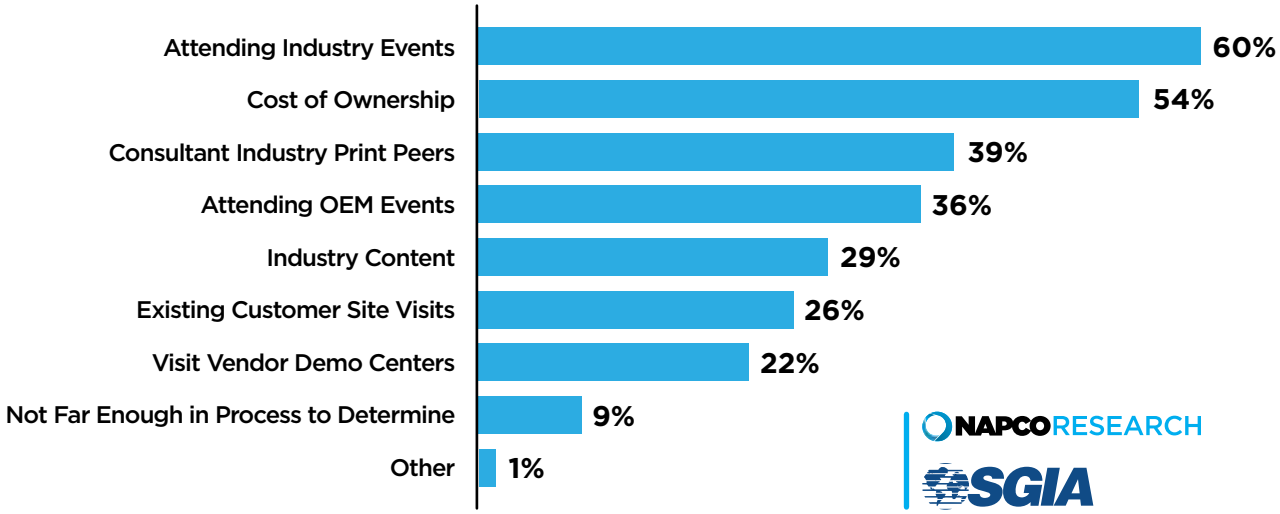
Q: Choose the OEMs from the list below that you evaluated/considered/or are planning to evaluate in your inkjet purchase process? (choose all that apply) n=396

DUE DILIGENCE

The most beneficial due diligence in adopting production inkjet, for all segments, was Attending Industry Events and Calculating the Cost of Ownership. The graphs below show the additional forms of due diligence selected across all segments and the frequency of the two highest by segment.

MOST BENEFICIAL DUE DILIGENCE IN ADOPTING PRODUCTION INKJET

Segment Average Due Diligence



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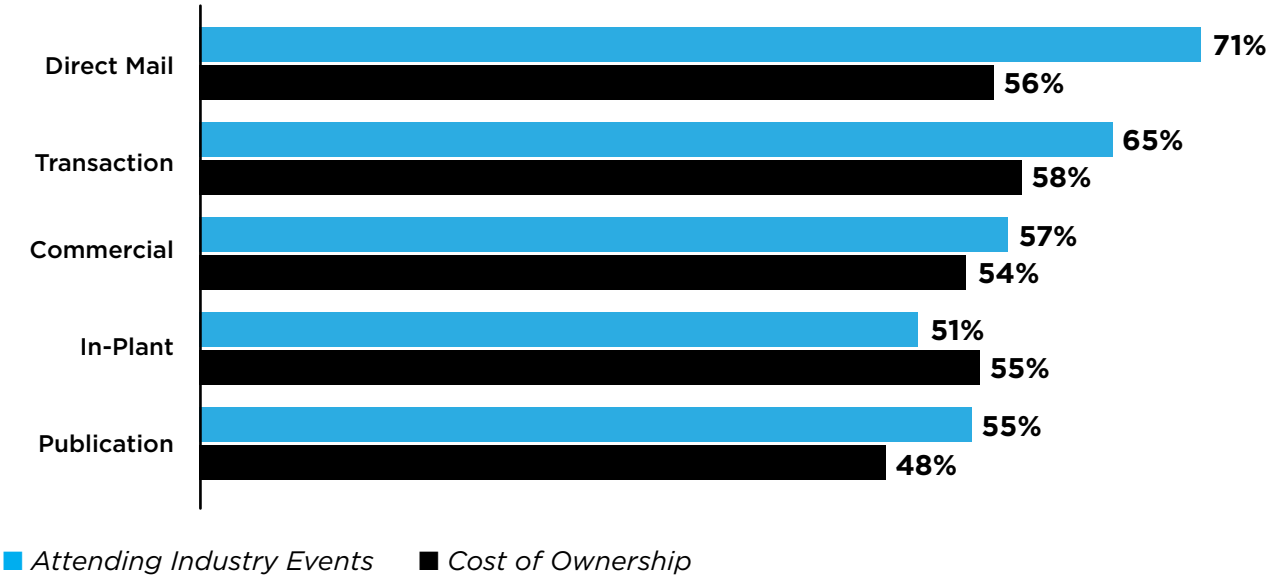
Segment Most Beneficial Due Diligence



Q: When conducting your due diligence in adopting production inkjet printing technologies, what is/was most beneficial to your research/purchase process? (choose top 3)
n=344

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Comments made by web survey participants and phone interviewees when asked if they could do things differently related to due diligence, they responded with:

- "Instead of sending files and getting the OEMs to print at their facility, I would have sent in our papers — the papers that we were planning on using." (In-plant Printer)
- "The buying process for inkjet is similar to the due diligence to purchasing a 40" offset press." (Don Kirkland, Arbor Oakland Group)
- "Perform hands-on equipment testing and do side-by-side comparison of products." (Survey Participant)
- "Do the market research to determine sales projections." (Survey Participant)

TIME FROM RESEARCH TO PURCHASE

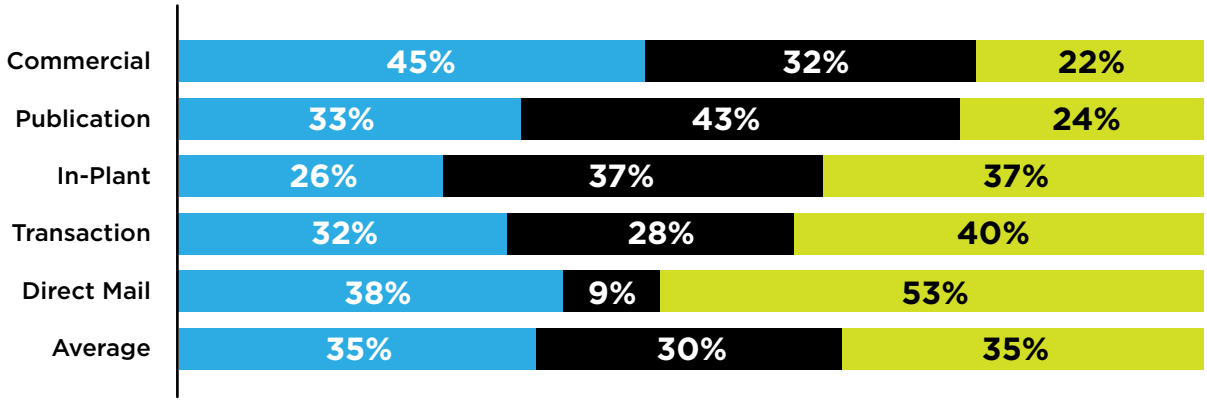
Across all segments, about 1/3 of printers spent less than six months from research to purchase of their production inkjet press, about 1/3 spent six to 12 months, and about 1/3 spent more than 12 months. The distribution of these times varied between segments as shown in the graph below.

Much of the time spent was likely based on each printer's current print technology, their decision and purchase drivers, and their ability to devote the time to work on the purchase decision.

Some comments concerning this during phone interviews included:

- "First inkjet press took about 15 months, the second one took about a year, and most recently it was six months." (Rick Lindemann, Total Printing Systems)
- "Purchase process, including research, took just three months of very concentrated work." (In-plant Printer)
- "From beginning to end, the journey was probably 20 months." (Mike Lincoln, State of Colorado)
- "I wish I could speed it up. It's taken me two years to get these two inkjets in place. The analysis is something you have to do, and that was eye-opening to me when I crunched a lot of numbers." (In-plant Printer)

Time from Research to Purchase of IJ



Q: From the time you began to research production inkjet, how long did the research and purchase process take? n=212

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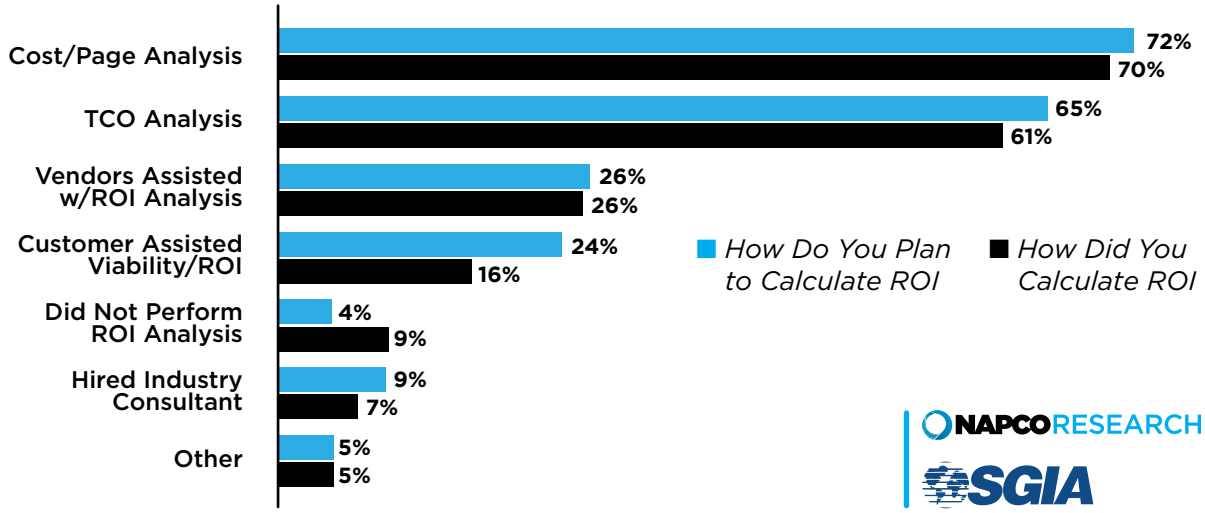
4. Post-Purchase

ROI (RETURN ON INVESTMENT) CALCULATIONS

By a factor of more than two-to-one, the primary methods printers used or planned to use to calculate ROI were Cost per Page and Total Cost of Ownership (TCO) Analysis. The graphs below show the collective average responses and the two highest methods for each segment.

HOW 'DID YOU' / 'DO YOU PLAN TO' CALCULATE ROI (RETURN ON INVESTMENT)?

Segment Average



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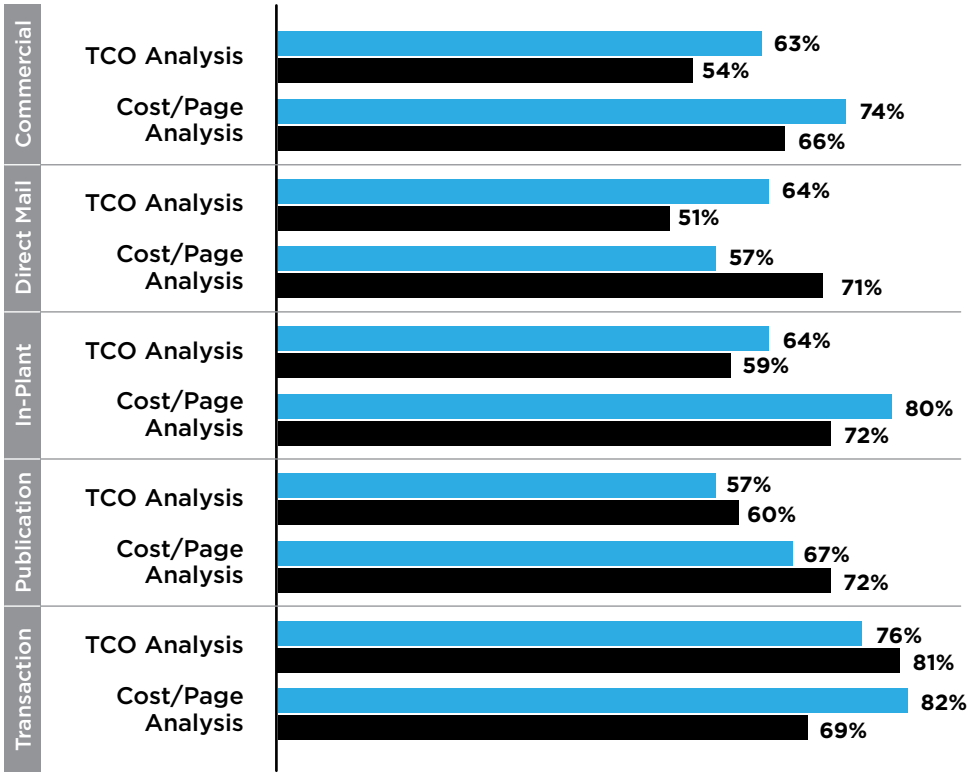
How ROI Was Planned and Calculated



Q: For your previous production inkjet purchase, how, if at all, did you calculate Return on Investment (ROI)? (choose all that apply). n=245

Q: For your planned production inkjet purchase, how, if at all, do you plan to calculate Return on Investment (ROI)? (choose all that apply). n=217

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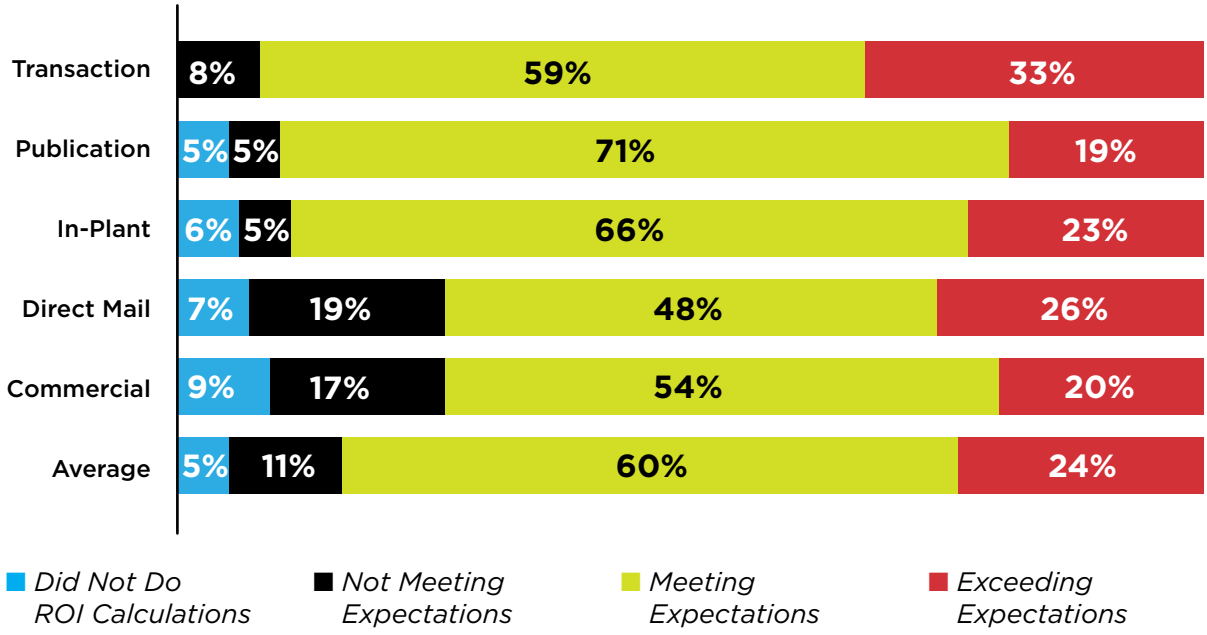
Responses from phone interviews and from survey participants listed in 'other' included:

- "Our budget was structured on a toner platform. With inkjet uptime, better throughput, and more reliability, our labor expenses were reduced, so we saw savings." (Mike Lincoln, State of Colorado)
- "We worked out how fast we could pay for the investment. We were very realistic in our expectations. We knew once we got into it, there would be more and more products we could move over to inkjet, which has happened." (In-plant Printer)
- "Even with monochrome applications, the speed and versatility of an inkjet device is disruptive technology that we needed to adopt." (Survey Participant)
- "Volume due to enterprise consolidation and project conversion to inkjet." (Survey Participant)

ROI (RETURN ON INVESTMENT) EXPECTATION

Printers Met or Exceeded their pre-purchase ROI expectations for production inkjet more than 80% of the time. By segment, responses clustered into two groups: with 90% of Transaction, Publication, and In-plant printers Meeting or Exceeding expectations and 75% of Direct Mail and Commercial doing the same. Also of note was about 5% of printers didn't calculate an ROI.

Inkjet Meeting ROI Expectation?



Q: Based on your ownership of production inkjet printing equipment so far, have you met your pre-purchase ROI expectations?
n=205

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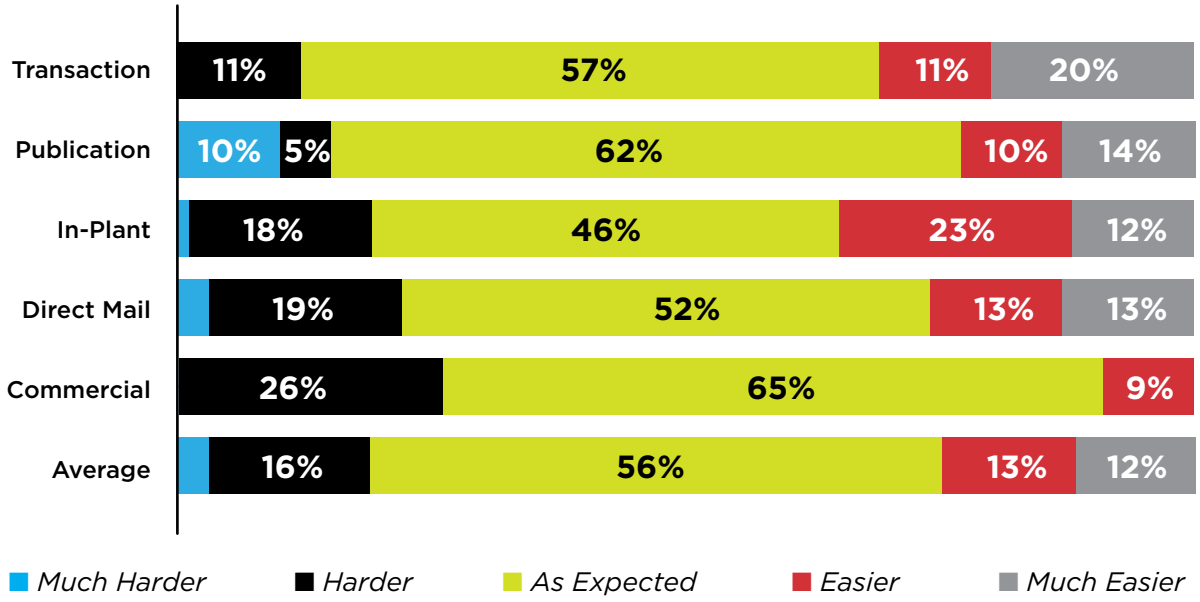
EXPERIENCE DEPLOYING

Printer experience deploying production inkjet was As Expected, Easier, or Much Easier than Expected 80% of the time – similar to the percentage of printers who Met or Exceeded their pre-purchase ROI.

Some experiences printers had deploying inkjet from the phone interviews included:

- "It was easier than I expected. The vendor provided excellent training and spent a lot of time with our staff. We had two operators that really embraced it and then took the lead training. That made it much easier. Without the vendor support, we probably wouldn't have been able to achieve what we did." (Mike Lincoln, State of Colorado)
- "We ran into normal snags installing new equipment but it was nothing compared to installing an offset press. It was very smooth getting it up and running." (In-plant Printer)
- "With digital presses, you don't just load them up and hit print. You have to learn the nuances of the machine, the ink, the materials, etc. Deployment went as expected but there was a greater learning curve than we thought. Be prepared to run tests. Once you learn them [inkjet presses], they run well." (Jim Kersten, Diversified Labeling Solutions)
- "It was a little harder but new press installations generally are harder. If anything, they were surprised it went according to plan as much as it did because it was so different than anything they did before." (Art Kunder, Tidewater Direct)

Experience Deploying Inkjet



Q: Choose the statement below that best describes your experience thus far in deploying production inkjet.
n=201

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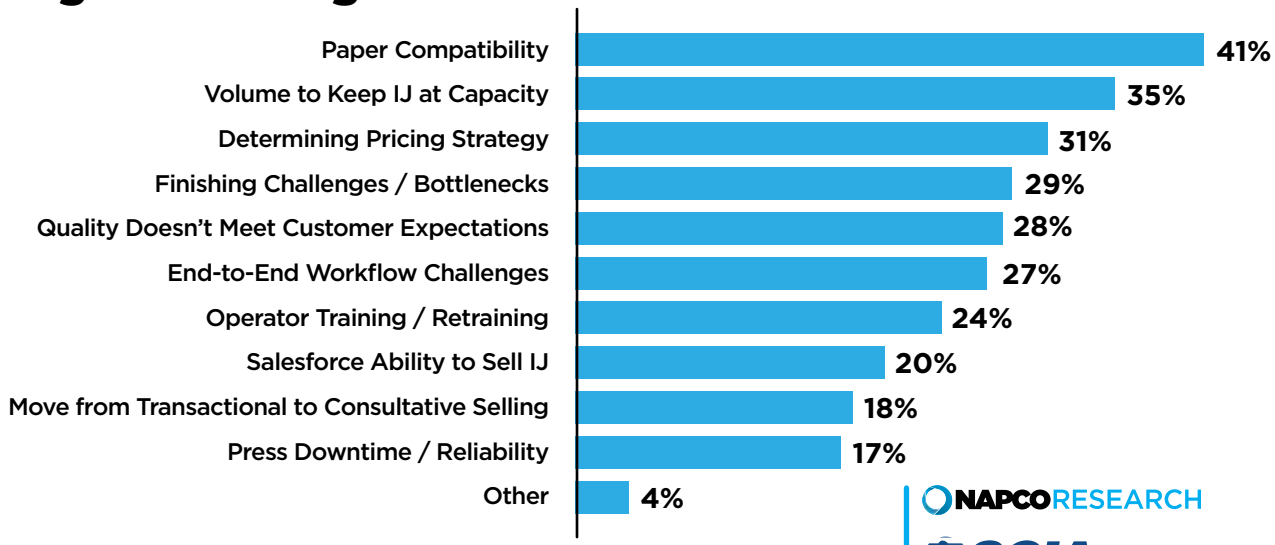
DEPLOYMENT CHALLENGES

The biggest single challenge printers faced deploying inkjet was paper compatibility. Other frequently mentioned challenges were having sufficient volume to keep the printer at capacity and determining a pricing strategy. These challenges were primarily due to the difference between inkjet and either toner or offset presses. The complete survey results are graphed below, showing the averages across segments and the top two challenges by segment.

CHALLENGES FACED DEPLOYING PRODUCTION INKJET

Segment Average



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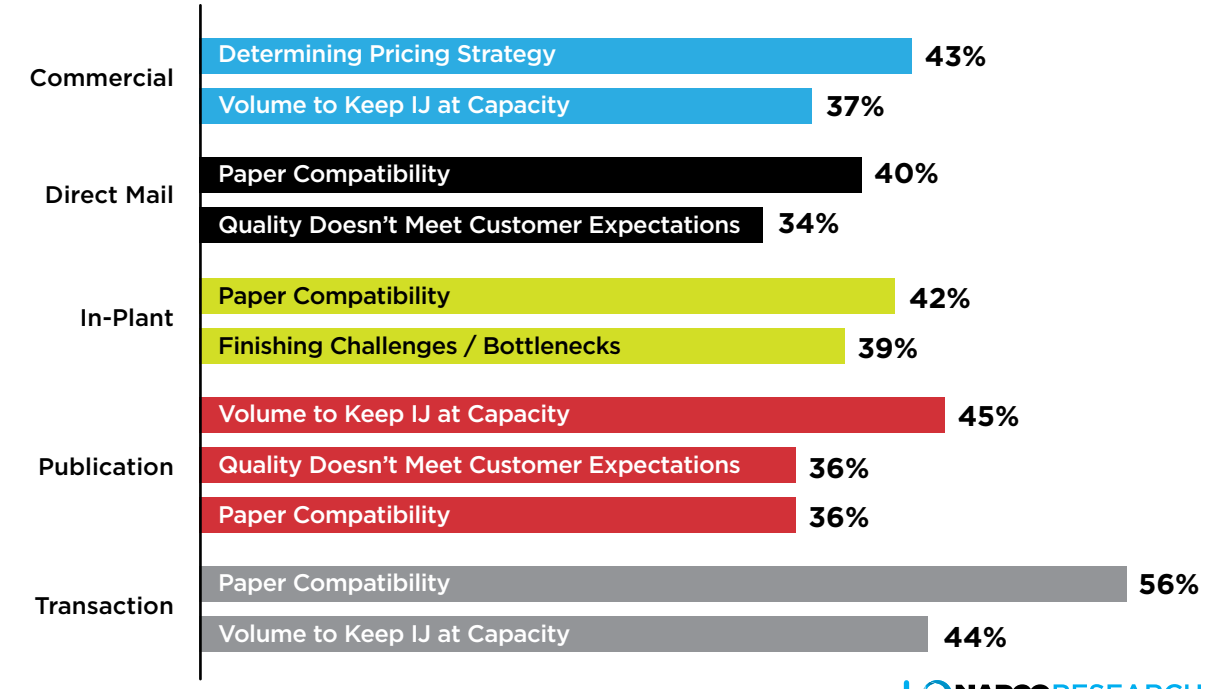
Segment Top Deployment Challenges



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Q: What are the biggest challenges you've faced in deploying production inkjet? (choose top 3)
n=233

Responses from phone interviews and from survey participants listed in 'other' included:

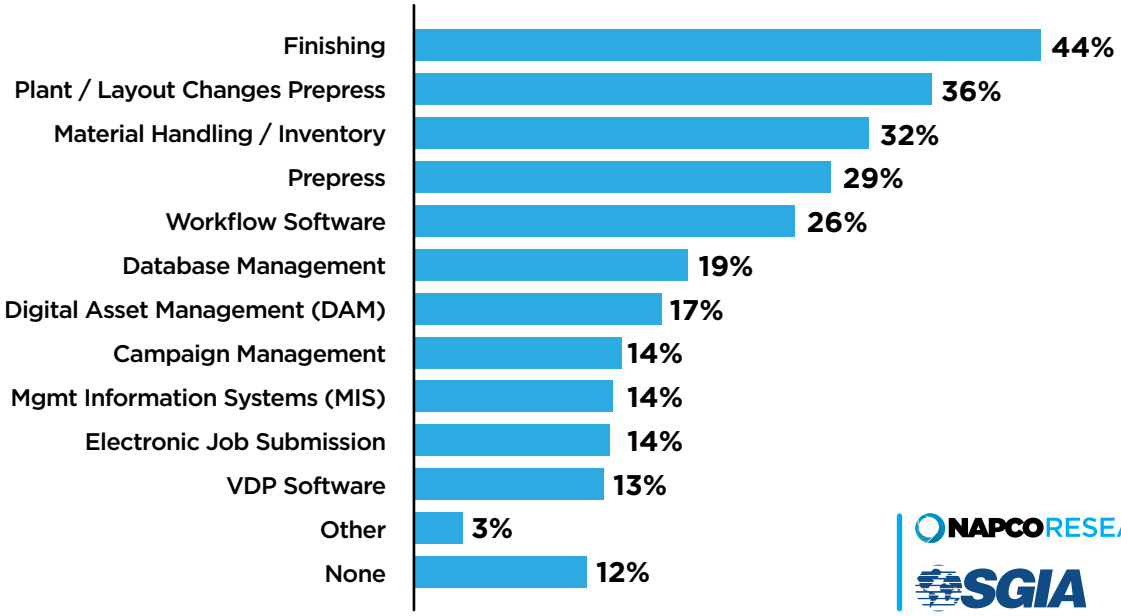
- **Paper:** "Spend more time understanding the substrates. I thought I had done a good job with that. I didn't. We were concerned with sheet opacity and its ability to take ink without too much bleed-through. We landed on a treated 24-lb. offset sheet. The brightness was where I wanted it, but it gummed up our friction inserters. The 24-lb. sheet also pushed us into 3 oz. So we quickly changed to a 20-lb. sheet, but the inserter didn't like its surface friction. The various treatments on the roll stock were gumming up the rollers so it took the better part of four months to land on a sheet our vendor would certify on the inserter to make sure we could get the throughput we needed. Once that was sorted out, the machine has been a tremendous asset." (Mike Lincoln, State of Colorado)
- **Pricing:** "Had to figure out how to estimate jobs because of the different workflow, material costs, and not knowing how much ink we'd use." (Jim Kersten, Diversified Labeling Solutions)
- **Quality:** "Haven't had issues getting people what they wanted, but print quality is not easy. It takes some work. Just one of those costs is hard to account for. Uptime has been phenomenal. The more you run, the better they run. Hardest thing is if you don't run it a lot." (Bob Arkema, Johnson & Quin)
- **Operations:** "Understanding the job needs to be planned from the back end versus the front end in production." (Survey Participant)
- **Operator Training:** "Any time you change a workflow process with existing staff, training and re-training is paramount, and full comfort in implementation among the staff is never as fast as you'd like it to be. Some may not be able to handle it." (Survey Participant)
- **Sales Training:** "Educating the sales force to understand the processes, finishes, workflow, color, etc., to be able to use solution selling and to upsell our ability. It's not just personalized print." (Survey Participant)
- **Customer Training:** "Educating the end customer about this new technology and its ROI benefits to them." (Survey Participant)
- **Customer Competition:** "Didn't want to be late to the party but had to make it work and needed to balance seeing customers making the move on their own. We had new technology and installation challenges. If it breaks, you depend on the OEM to fix it. It doesn't start up and shut down the same way as our other equipment." (Art Kunder, Tidewater Direct)

TECHNOLOGY / WORKFLOW CHANGES

The most frequently selected changes made by printers with their first production inkjet press was to workflow and the integration of the press to their pre (plant/layout changes prepress) and post (finishing) print processes. The graphs on the following page show the average technology/workflow changes made with the first inkjet press and the top three changes for each segment.

TECHNOLOGY / WORKFLOW CHANGES MADE WITH THE FIRST PRODUCTION INKJET PRESS

Segment Average



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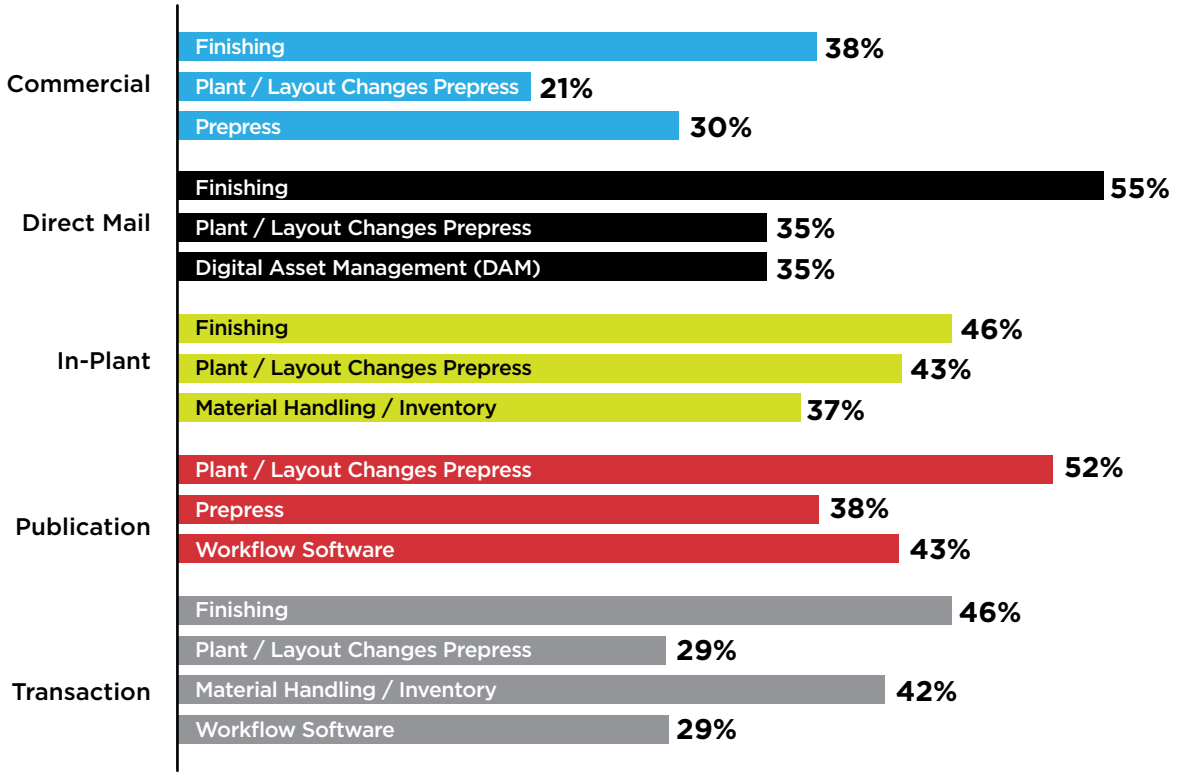
Top Technology/Workflow Changes



Q: What technology/workflow changes, if any, did you make the first time you took delivery of a production inkjet press? (choose all that apply).
n=205

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Responses from phone interviews and from survey participants listed in 'other' included:

- **Finishing:** "One change was in finishing, going to a roll-to-fold unit. But it was not difficult to make it work." (Insurance Company)
- **Workflow / Staffing:** "Took the opportunity to adjust production process and make it more efficient. Eliminated about 40% of our workforce." (Survey Participant)
- **Prepress:** "Digitizing, imposition, and print marks, as opposed to the manual process before, eliminated so much floor space." (Rick Lindemann, Total Printing Systems)
- **Information Technology:** "If you are a printer and not a data company, it could be overwhelming but it wasn't bad overall." (Bob Arkema, Johnson & Quin)

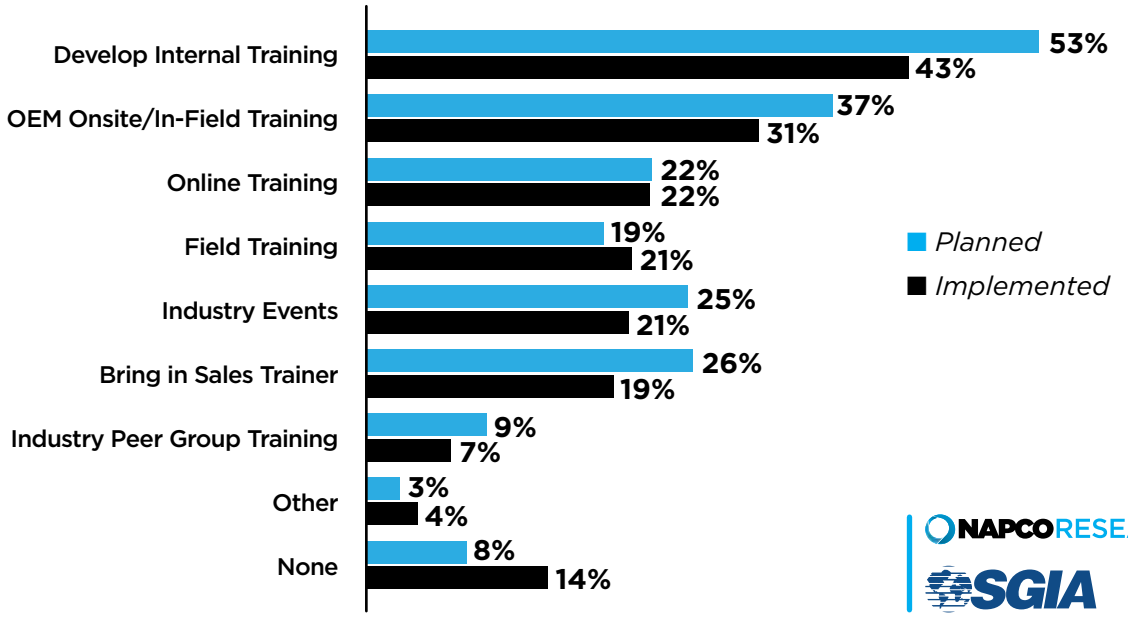
SALES TRAINING

Printers' most frequently selected form of sales training when both planning for and implementing training was to Develop Internal Training and to Use OEM for Onsite / In-Field Training. Other methods were selected, but none as broadly.

Other planned and implemented sales training mentioned in the 'other' section of the survey and during phone interviews included:

- "Learn as you go, spreading that knowledge to the team and those that didn't get it didn't last." (Art Kunder, Tidewater Direct)
- "Didn't have training for the sales staff. Sales makes a request and production has to figure it out." (Mark Teague, Presort Plus)
- "Fewer restrictions. Their strategy was to embrace technology. This is the main thing they are actively selling." (Bob Arkema, Johnson & Quin)
- "Striving for cost savings, therefore the switch to inkjet wasn't a choice for our team; it was mandatory." (Survey Participant)

Segment Average Sales Training



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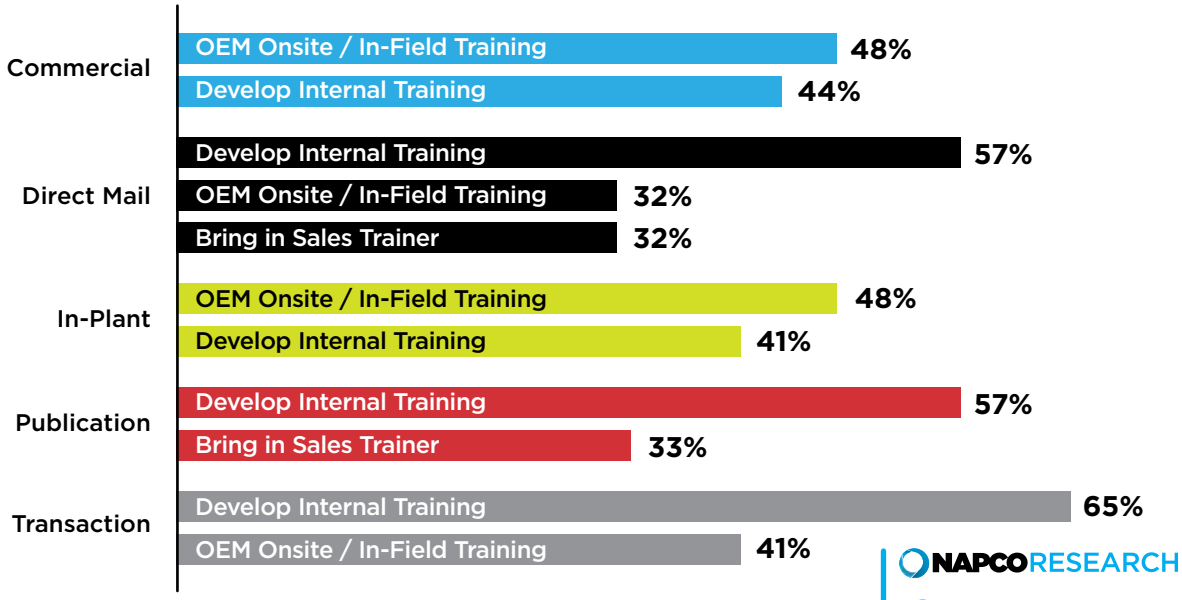
The top two forms of planned and implemented sales training by segment are graphed below to illustrate the variation in responses between segments and between what was planned and actually implemented.

PLANNED AND IMPLEMENTED PRODUCTION INKJET SALES TRAINING

PLANNED Segment Sales Training



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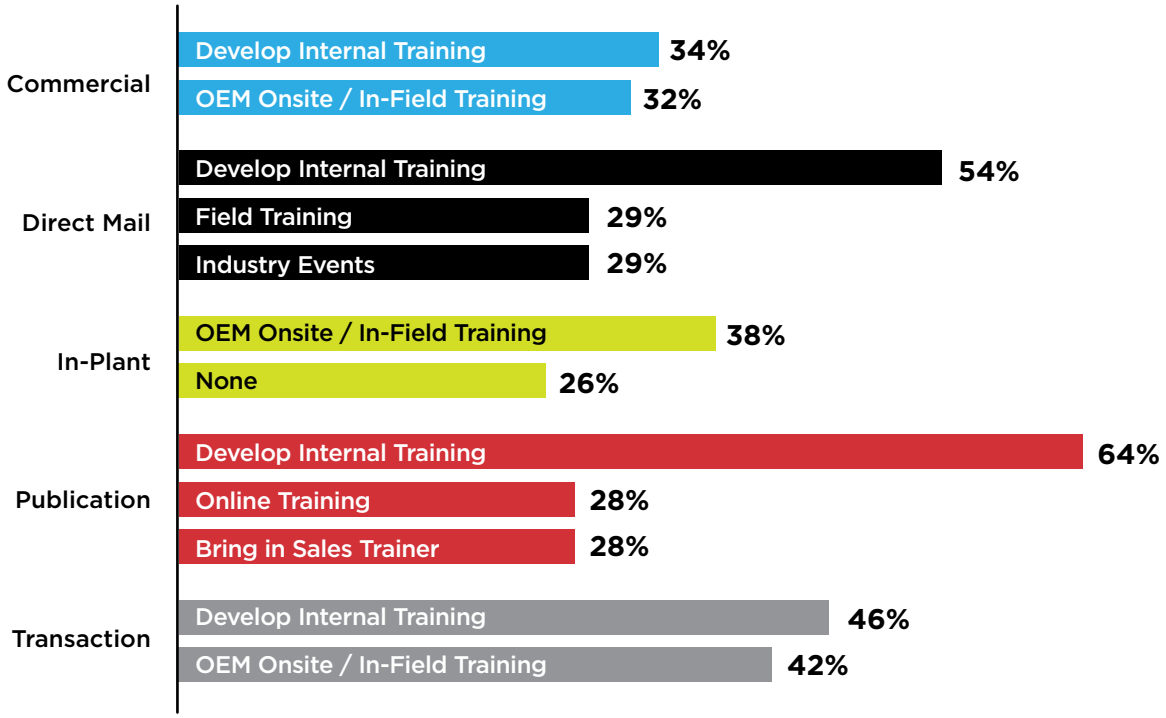
IMPLEMENTED Segment Sales Training



Q: What training, if any, have you implemented for your sales staff on production inkjet capabilities? (choose all that apply). *n=214*
Q: What training, if any, are you planning for your sales staff on production inkjet capabilities? (choose all that apply). *n=242*

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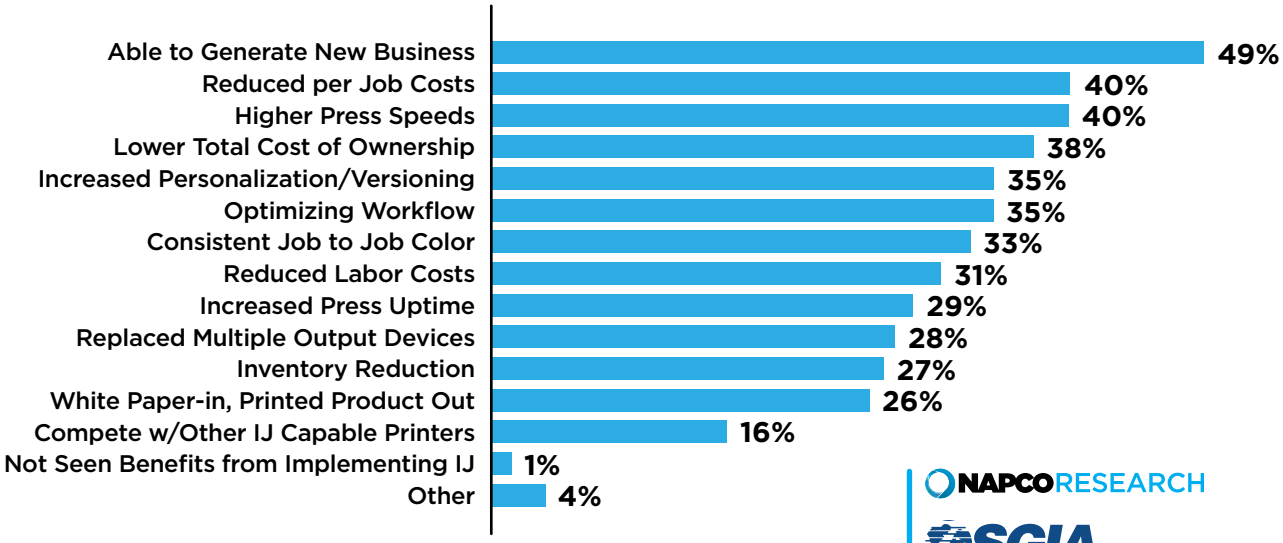
5. Impact

DEPLOYMENT BENEFITS

The benefit of deploying production inkjet most frequently selected was the Ability to Generate New Business. All the segment responses and the frequency they were selected is graphed below followed by the two highest benefits for each segment.

BENEFITS SEEN FROM DEPLOYING PRODUCTION INKJET, COMPARED TO OTHER SYSTEMS

Segment Average



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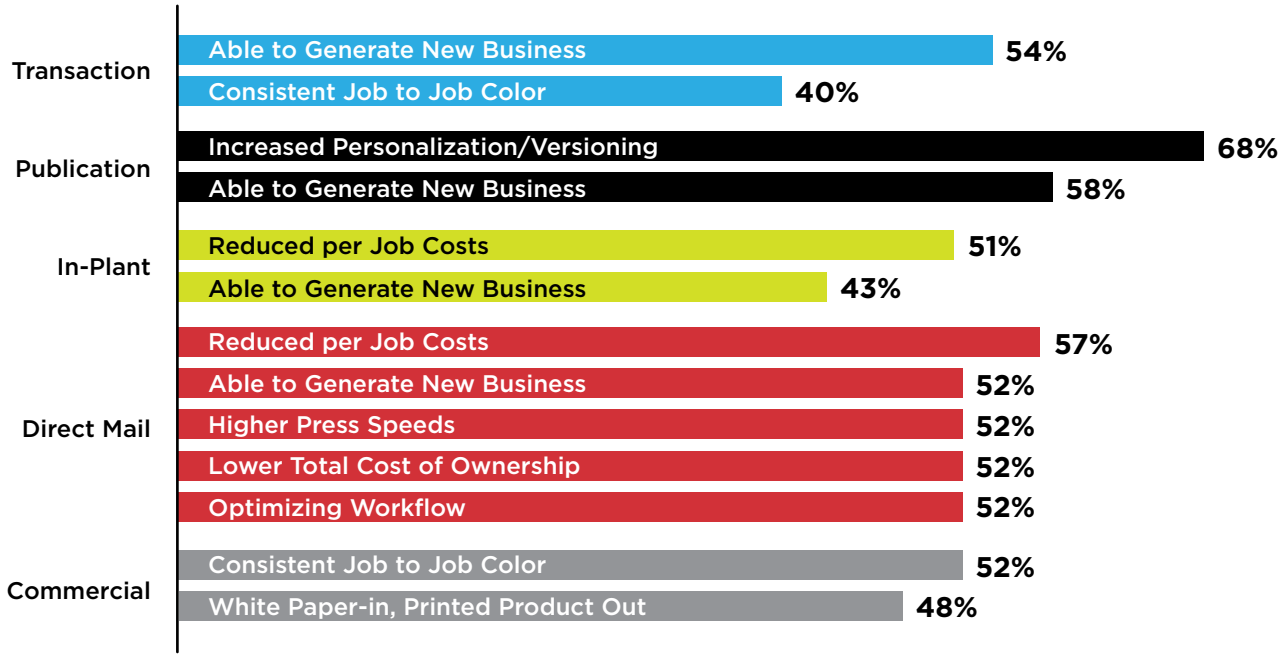
Segment Benefits Deploying Inkjet



Q: What benefits, if any, have you seen as a result of deploying production inkjet as compared to the systems it was replacing or complementing? (choose all that apply)
n=211

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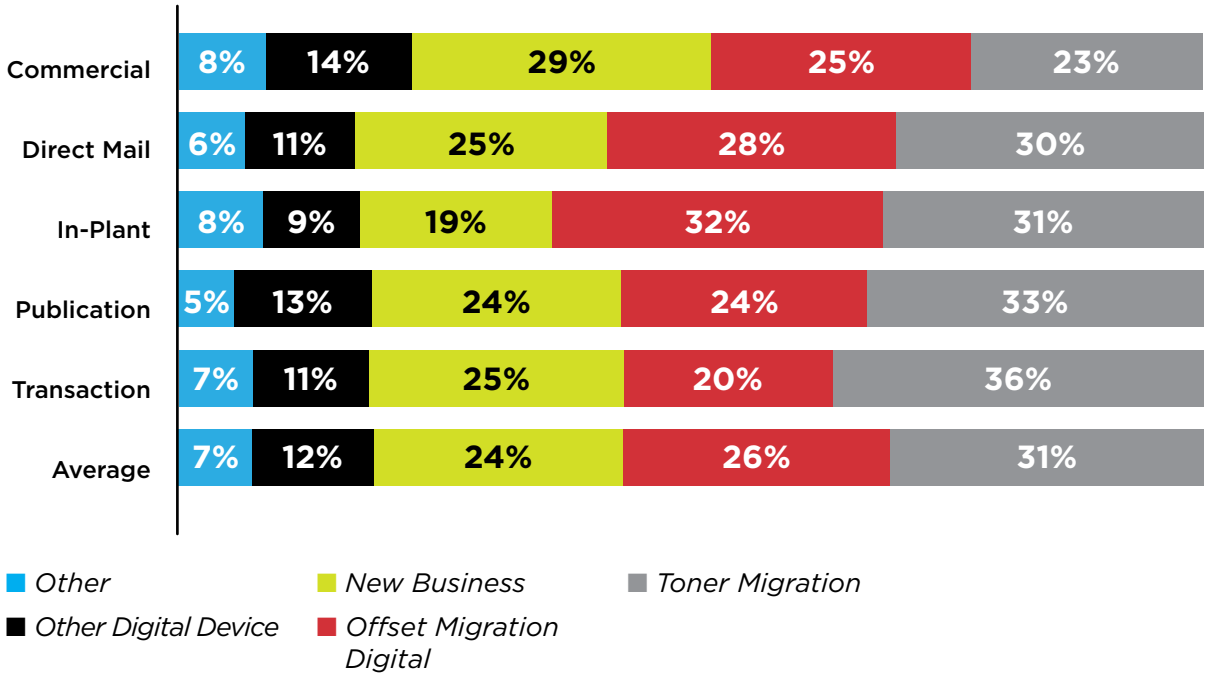
Additional benefits seen from deploying inkjet mentioned during phone interviews included:

- "Able to do smaller jobs more efficiently, take on more challenging jobs, such as multi-versions, variable data, and allowed them to get into new markets." (Jim Kersten, Diversified Labeling Solutions)
- "Greater flexibility, for the same price—you can move over to color inkjet with no loss in quality. Introduced some new applications because of inkjet—opened new opportunities; the majority of clients have no clue." (Bob Arkema, Johnson & Quin)
- "Gives a lot more flexibility and speed to respond to opportunities they would have turned down before." (Don Kirkland, ArborOakland Group)
- "Customers really like the quality of the crisper, clearer, and easier to read black text. We like the uptime and speed. These inkjets have definitely opened up our ability to do more direct mail." (Insurance Company)

LEGACY WORK MIGRATED AND NEW BUSINESS

About 80% of all work running on production inkjet presses across all segments came from three sources: Digital Toner Migration, Offset Migration, and New Business. The percentage of work for each varied slightly between segments, but collectively represented 80% of all work.

Work Migrated to Production Inkjet



Q: Thinking about the entire volume of work currently running on your production inkjet press(es), what is the percentage of work migrated from legacy presses vs. work acquired via new business?
n=212

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APPLICATIONS DEPLOYED

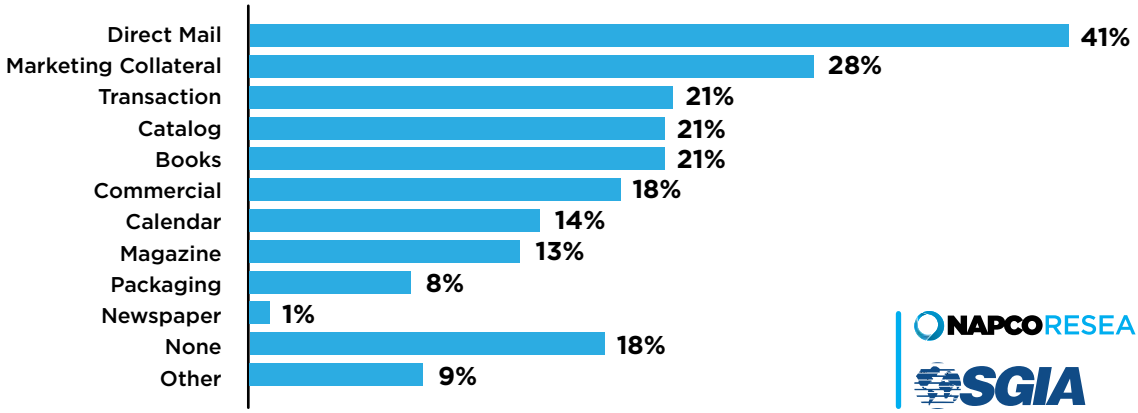
Application deployed to production inkjet generally followed very traditional segment applications, such as:

- Commercial segment → Commercial print
- Direct Mail segment → Direct Mail print
- Transaction segment → Transaction print
- Publication segment → Book, Magazine, and Catalog print

Beyond these traditional segment applications, Direct Mail was the most frequently selected 'new application.' Below are graphs showing the average selections across all segments and the top two applications each segment selected.

NEW APPLICATIONS DEPLOYED AS A RESULT OF PRODUCTION INKJET

Segment Average



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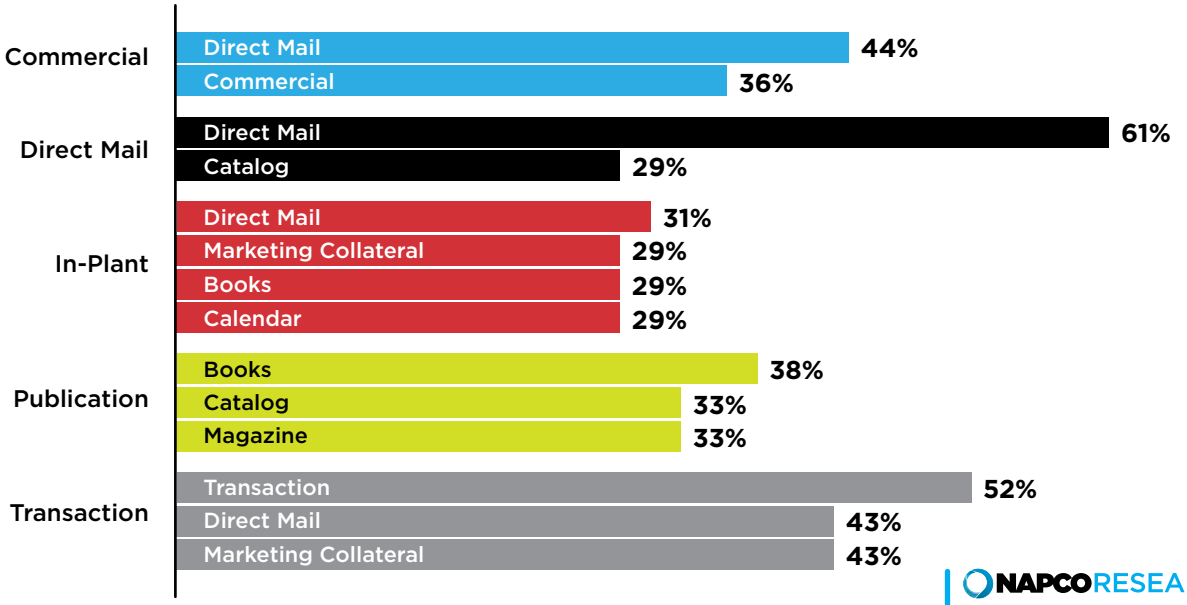
Applications Deployed on Inkjet



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Q: What new applications, if any, have you been able to deploy as a result of inkjet? n=201

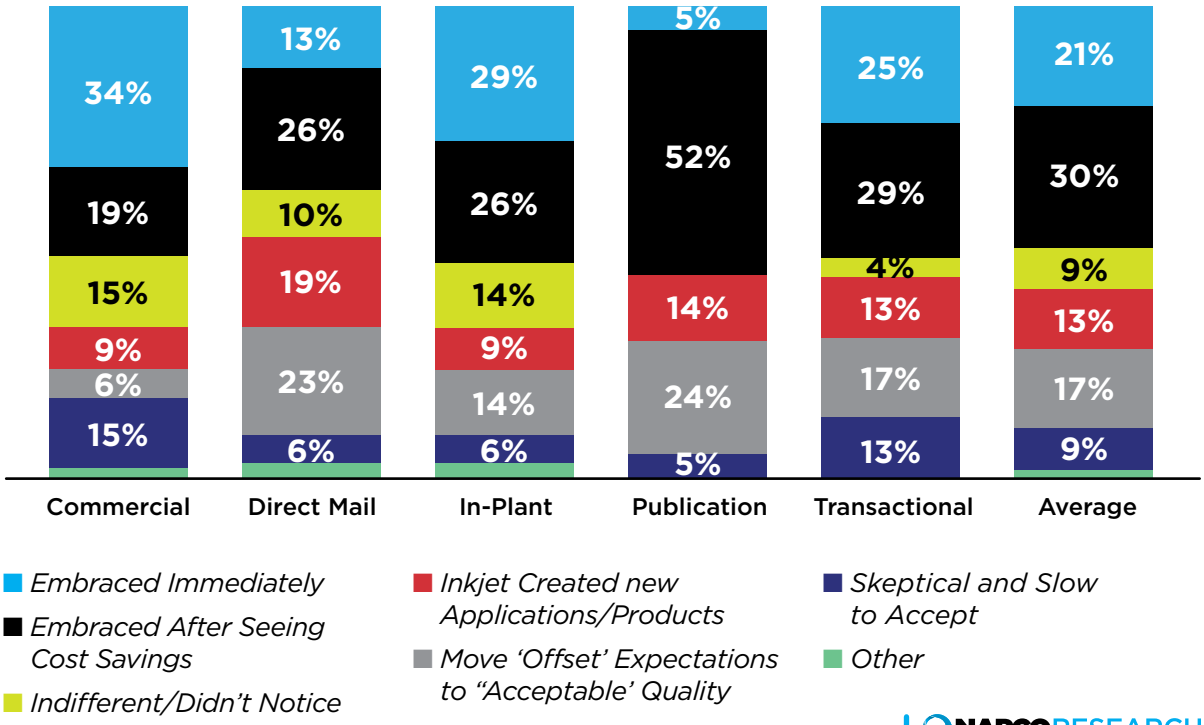
'Other' applications deployed by segment as a result of inkjet by segment included:

- **Commercial:** Personalization, Matching Inserters and Bindery for Versioning, New Products, Posters, Labels, Welcome Kits, Fine Art Reproduction
- **Direct Mail:** Variable Fulfillment, Lower Cost / Higher Volume VDP
- **In-plant:** Security Printing, Envelope Variety, Personalized Outer Envelopes
- **Publication:** Posters, Limited Edition Prints
- **Transaction:** Posters and Minimum Amounts

CLIENT RESPONSE

Printers reported their clients Embraced Production Inkjet Immediately, Embraced it After Seeing Cost Savings, Were Indifferent or Didn't Notice 60% of the time. An additional 13% of printers viewed inkjet as an opportunity to create new applications or products, bringing the total level of positive client responses to 73%. The remaining quarter of clients were skeptical or needed to move their expectation from 'offset' to 'acceptable' quality to accept the move to inkjet.

Existing Client Response to Product Inkjet



Q: How have your existing clients responded to inkjet?
n=205

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Client response printers expressed during phone interviews included:

- "They have responded very well, especially with the turnaround times. As the speeds come up, the key is productivity. The faster these machines can run, the better. You're going from a unit that does 3,000 per hour to a unit that does 7,000 an hour." (In-plant Printer)
- "Inkjet technology is light years ahead of other technology. Clients will use it for versioning. Equipment is outpacing what marketing has in terms of data capability." (Bob Arkema, Johnson & Quin)
- "In showing them the quality, we weren't sure if they were going to like it. The idea was to migrate from toner to inkjet as much as we could because of the savings and the speed. These days, it's a no-brainer. They don't even see the difference." (In-plant Printer)
- "The designers loved it. The month after we installed inkjet and gave a briefing on inkjet technology to our designers, they started designing the wrappers in four-color because the inkjet doesn't care how many colors it is, and it runs at the same speed." (In-plant Printer)

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WHO WE ARE

Led by a former Forrester Research analyst, the NAPCO Research team crafts custom data-centric solutions that leverage our highly engaged audiences across the markets in which we operate, our industry subject matter experts and in-house research expertise. We partner with our clients to identify their unique business problem and create solutions that enable deeply informed decision making.

NAPCO Research can help with:

- Business goal prioritization
- Opportunity discovery
- Market segmentation
- Landscape insight
- User needs and wants
- Product features and functionality
- Content marketing strategy
- Sales strategy and tactics
- Market conditions
- Benchmarking
- Industry trends
- Brand awareness

WHO WE ARE

SGIA — Supporting the Leaders of the Digital & Screen Printing Community

Having its origins in the screen printing industry, SGIA embraced the digital revolution early on and is now the trade association of choice for professionals in the industrial, graphic, garment, textile, electronics, packaging and commercial printing communities looking to grow their business into new market segments through the incorporation of the latest printing technologies. SGIA membership comprises these diverse segments, all of which are moving rapidly towards digital adoption. As long-time champions of digital technologies and techniques, SGIA is the community of peers you are looking for to help navigate the challenges of this process. Additionally, the SGIA Expo is the largest trade show for print technology in North America. "Whatever the medium, whatever the message, print is indispensable. Join the community — SGIA."