Artificial Intelligence in the Printing Industry: The Journey Begins

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Produced by the PRINTING United Alliance and NAPCO Research for its members.

Message from the CEO

Dear Alliance Member,

Artificial intelligence is a once in a generation topic that promises to change almost every way in which we work, discover, interact, and understand the world around us. Whether that change will be for better or worse is a matter of perspective.

To ignore the possibilities and the pitfalls, to wait and see what develops, to dismiss it as hyperbole, would be folly. Our already wired world generates vast amounts of data. When this is combined with AI and "big data" becomes "fast data", it's hard to imagine where these capabilities will lead. There are, of course, dire predictions. Notions such as 40% of jobs that exist today will be replaced by AI, or that machine learning will outperform humans, become a version of sentient, and take over, are prevalent. Then there are promises of a golden age due to the efficiency of AI, where we can devote most of our day to other things, confining our work life to a handful of hours. The actual outcomes, of course, will probably not be binary, but multi-faceted, and as complex as the underlying technology.

As an association executive, I am already inundated with events, webinars, conferences, newsletters, and content solely devoted to the application of AI to the various businesses we cover, namely media, events, and our membership organization. If not already the same for PSPs, it soon will be. There will be policies to develop for implementation, legal concepts to master, data privacy concerns and regulations, system requirement upgrades for "fast data" processing, and interoperability of tools to worry about, among others. For many, AI tools will be used every day. But to make the most of them, we need to truly understand how they work and what they are capable of. The learning curve is rather steep.

The problem we have, of course, is that we are all busy. How much time should we devote to this new wrinkle? How can an entire team devote enough collective time to move ahead with clarity, confidence, and vigor, all the while running a business? In this report there are some examples that might make eating this elephant a bit easier.

We're at the beginning of a new era. It is both exciting and daunting. We believe this study will help increase the excitement, while decreasing the daunt.

Enjoy,

Ford Bowers, CEO
PRINTING United Alliance

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Introduction

Artificial intelligence (AI) is poised to be the next big printing industry disruptor. As AI is in the early stages of industry adoption, the combined PRINTING United Alliance and NAPCO Research team initiated an ongoing comprehensive research effort to track its adoption and use. This research report explores the current status of AI use in the printing industry, the specific functions where AI is being implemented, the benefits AI is delivering, and the broader, longer-term implications of AI for industry firms.

The research study sheds light on the present use of AI and also provides guidance on how industry players are initiating AI integration into their operations. This study examines different scenarios and potential impacts of AI, to provide a realistic view on AI's role today, and how it will shape the future of the printing industry.

This report is designed to help printing industry organizations understand the practical applications and strategic benefits AI can deliver to the printing industry.

Methodology

Given the importance of AI and the lack of information on how print providers are currently using it, the PRINTING United Alliance and NAPCO Research team has been consistently including AI-related questions in its ongoing survey research. This report will include key findings from those efforts.

In addition, the research conducted in-depth telephone interviews with print providers using AI and those not using AI. Also, various secondary research sources and interviews with AI experts were conducted to define the current state of AI adoption, understand AI technologies, and identify trends driving innovation.

Key Research Findings

AI has captured the attention of all industries and many in the printing industry are discussing and reporting its potential. AI is a topic at many printing industry events and specific conferences on AI have emerged. While the topic is generating immense discussion around AI's potential, the goal of this research study is to report on how print providers are using AI in their operations today and their future plans for the technology. The survey data and in-depth interviews indicate that printing industry executives understand the transformative power AI possesses, but its use is in the early stages of adoption as industry participants are learning to harness its power.

"[AI is] that foundational, yet it's a tale of two cities," says David Rosendahl, president and co-founder of MindFire, a company leveraging AI to make direct mail trackable and interactive. "On one hand, people feel inundated with AI messaging, wondering if they're too late to join the conversation. On the other hand, there's still a significant lack of awareness. Both consumers and print industry professionals are largely unaware of AI's potential applications. We're already seeing AI revolutionize how brands connect with customers through direct mail."

AI Use Cases

Here are examples of the types of AI applications print providers who were interviewed reported using today. Each company's AI efforts are reported in greater detail later in this report.

Commercial Printing

- A commercial printer with annual sales of $200 million to $250 million reported using AI to automate client outreach, ensure communication consistency, optimize job scheduling, and screen job candidates.

- A commercial printing company with annual sales between $20 million to $40 million is using ChatGPT for content generation and marketing outreach (in lead generation emails), estimating, and implementing a new ERP system.

- A commercial printing company with annual sales between $5 million to $10 million is starting to test the waters with content support tools like Grammarly and ChatGPT and is beginning to transition to an MIS system with AI functions.

- A commercial printing company with annual sales between $5 million to $10 million indicated using AI features included in its offset press to adjust settings and prepress software to edit images.

Graphic and Sign Producers

- A graphic/sign production company with $20 million to $40 million in sales is using AI to change the way in-bound materials are received, better manage inventory, support business decisions, and sketch concepts.
- A graphic/sign production company with $150 million to $200 million in sales is using AI to enhance customer experiences, content marketing, graphics management, product and service profitability, and forecasting.
- A graphic/sign production company with $100 million to $150 million in sales is simultaneously pulling data from its equipment and ERP system to allow operators to check status in real time.
- A graphic/sign production company with $20 million to $40 million in sales is using AI today for content creation, design, sales, and marketing applications, while exploring other areas of use, such as integrating AI with its accounting and production systems.

Packaging

A package printer/converter with annual sales between $100 million to $150 million has implemented AI in its production process for file preparation, machine setup, and color management.

Reasons For Not Using AI

While the journey into AI has started for some printing companies, other interview participants not using AI cited obstacles preventing its adoption. Common challenges reported include:

- Understanding ways AI can improve operations and the best ways to implement it.
- Perception that the AI learning curve is steep, and fear of the level of trial and error required to effectively implement it.
- Lack of understanding of AI's full capabilities, potential applications, and efficiency/profitability benefits.

Adoption Strategies

Print providers reported pursuing various strategies for AI integration from creating implementation teams to hiring outside consultants to educate and train team members on possibilities. Nearly all interview participants agree on the importance of educating staff on how AI will enhance — not eliminate — their jobs.

Rick Bawcum, CEO and founder of Cimatri, a digital IT strategy consulting firm serving industry associations, explains that while AI is likely to alter existing employees' jobs, it is important for business managers to educate their staff on how it will both improve their roles and its gravity in staying competitive.

"I think the common wisdom today is that you probably won't be replaced by AI," Bawcum says. "But you may be replaced by somebody who's using AI to do the job now. So, I think if you are talking to the workforce, say, 'Hey, this is going to impact productivity in a positive way, and the more you participate in that equation, the more equipped you're going to be to benefit from it.'"

An AI Education Deficit Exists

AI has the potential to revolutionize the printing industry, but many professionals are still unaware of its full capabilities and potential applications. This knowledge gap presents both a challenge and an opportunity for the industry to educate and innovate.

Organizations using AI are more likely to displace competitors that are not.

AI: The Basics

Artificial intelligence refers to technology that enables computers and machines to simulate human intelligence and problem-solving capabilities. AI is software that learns from data to successfully perform tasks. This can include applications such as customer service chatbots replicating human speech patterns, discovering data patterns in spreadsheets, forecasting, and much more. AI can be used in print production in many ways including file preparation, color management, remote equipment diagnostics, quality control, job management, and beyond.

While AI has existed for many years, several factors are now drawing attention to its application and use. These include:

- Digitization and affordable storage of vast data sets, increases in computing power/speed, self-learning algorithms, and advances in natural language processing (NLP) and self-learning.

- Advances in big data (data sets that are too large and complex to be analyzed by traditional computer software) play a crucial role in AI capabilities. AI requires vast amounts of data to learn and make predictions, recognize patterns, and improve decision making.

- Generative artificial intelligence that is capable of generating text, images, videos, or other data, often in response to natural language instruction prompts. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

- A key enabler of AI adoption is GPT or generative pre-trained transformers. This is a class of AI models (ChatGPT is an example) that use natural language processing and machine learning. GPT is used today for conducting various tasks, including responding to customer communications at all times, as well as creating a variety of marketing content. It can summarize immense databases faster and more thoroughly than humanly possible. The ability of GPT models to learn, communicate what they learn in human language, automate processes, and enhance results makes them an inflection point in the application of generative AI to everyday business functions.

- The unfolding market for Fourth Industrial Revolution (4IR) technologies, such as the Internet of Things, robotics, and quantum computing are fueling the artificial intelligence software market.

Algorithm Capabilities

AI algorithms (rules and instructions) are like the brain cells of artificial intelligence. They enable machines to simulate human-like intelligence and perform complex tasks autonomously. These algorithms process data, extract meaningful insights, and make informed decisions. Here are three key AI algorithm capabilities advancing its transformative capabilities:

1. **AI algorithms don't just automate production and workflow, they automate activities that could not previously be automated.** For any time-consuming, low-value activity in any department, there is (or will be) an AI application to automate it, boost productivity, and free resources for activities that really matter.

2. **AI algorithms learn by doing.** Traditional computer software does only what it has been programmed to do. In contrast, AI algorithms learn as they are exposed to more data, expanding their capabilities, improving pattern recognition, trend analysis, and forecasting.

3. **AI algorithms process unstructured data efficiently.** This is the big data's part in AI. Think of big data as extraordinarily diverse, extensive data sets that include structured data, or data that fits neatly into spreadsheets such as financials, market demographics, and customer profiles; unstructured data, or data that spreadsheets do not handle well, such as audio files, video files, clients' web browsing history, blog posts, and tweets; and a mix of the two, such as the data generated by Internet of Things (IoT) sensors. The quantity and variety of big data are expanding rapidly because daily activities from browsing a website to contacting a call center leave a data trail. AI's ability to analyze unstructured data as efficiently as structured data vastly expands the intelligence on which to base analysis, decisions, and forecasts.

AI's Printing Industry Benefits

As AI continues to advance and gain adoption, it will impart specific impacts on the printing industry. The benefits AI will deliver to print include:

- Robotic AI in manufacturing will support printers and converters in moving materials through production and automating complex tasks.

- Automation of production and business management processes that previously required human intervention.

- Enhance key management activities including market identification and analysis and evaluation of the customer experience.

- Support decisions companywide, such as screening resumes, scoring sales leads, evaluating customer feedback in any form (posts, blogs, emails, voicemails, etc.), competitive analysis, forecasting, and forecast evaluation.

Surveys Report: AI Adoption in Early Stages

The combined PRINTING United Alliance and NAPCO Research team conducts ongoing surveys to track industry trends. For the past year, surveys have included questions on AI. The responses to these questions, included in this report, reveal the following:

- AI is in its early stages but print providers are showing increased interest in and adoption of AI.
- Adoption is starting in content and business support related areas, including copy writing, proofreading, notetaking, and trend analysis.
- Despite AI's growth in the print industry, many print providers report not having plans to implement AI.

AI Use Increasing

Data from PRINTING United Alliance State of the Industry Research, a program that conducts quarterly surveys of a constant panel of print providers across segments, shows that use of AI is increasing. Comparing two separate State of the Industry (SOI) surveys **(Figure 1)** shows participants have increased their AI adoption, which jumped from 24.7% of respondents in September 2023 to 40.0% in March 2024. In addition, the comparison between surveys shows a slight shift from 28.2% in September 2023 to 26.4% in March 2024 in those that plan to adopt AI, likely indicating they have added AI. There is also a notable decrease in resistance towards AI implementation, as the percentage of respondents that do not expect to use AI within the next year dropped from 48.4% in September 2023 to 32.8% in March 2024.

Figure 1: Print Providers AI Use is Increasing

Q. Which of the following is true for your company?
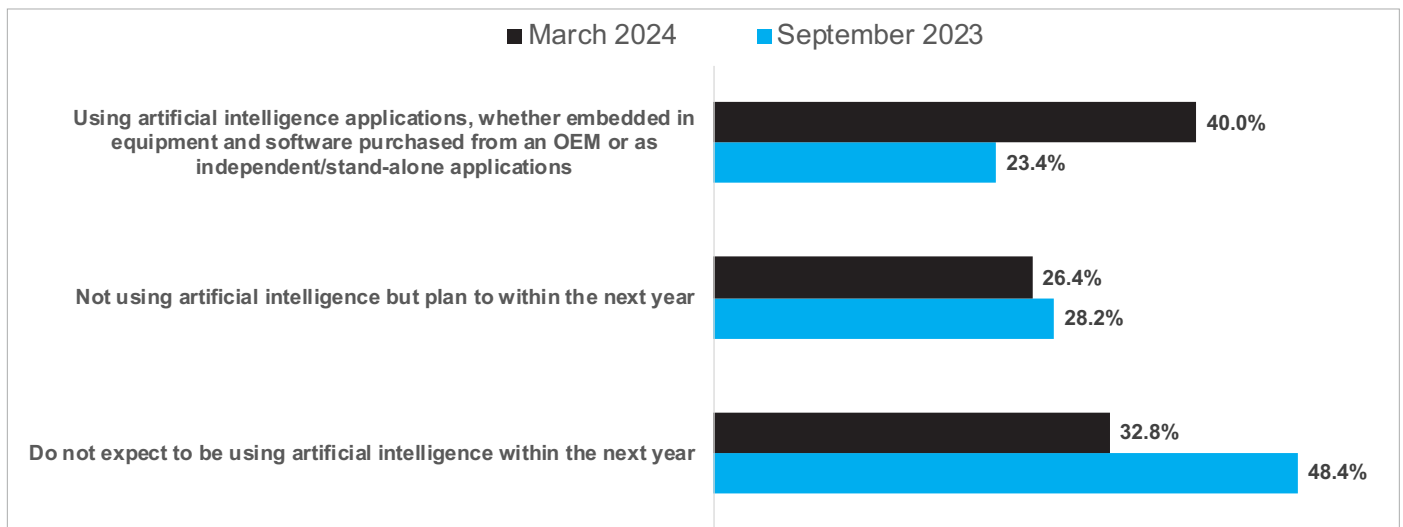
n=191 Print Providers

Source: PRINTING United Alliance State of the Industry Surveys, First Quarter 2024 and Third Quarter 2023.

This decline in the percentage of SOI Panel members who don't expect to use AI indicates a growing acceptance and recognition of the importance and benefits of AI within the industry.

Overall, the survey panel data demonstrates a positive trend towards increased AI use, with more printing organizations either adopting or planning to adopt AI technologies, and fewer remaining resistant to its implementation.

According to Royce Dodds, an AI specialist serving the decorative print market, among the key reasons print providers are adopting AI solutions is that the technology can help bring new hires up to speed. Especially in an industry like print that requires distinct knowledge and skillsets, AI can help reduce the learning curve for those new to the industry.

"What AI does, and what I try and actually show people, is that AI will bring people up to a set level," Dodds says. "It allows the new people on the team, to actually gain extra tool sets. That's what it is. It's not replacing work. It's assisting them."

A Deeper Dive on AI Applications

The State of the Industry Survey, First Quarter 2024 asked participants about the specific AI applications in use in their operations and those they planned to add. Table 1 shows the response to that question. The applications most used currently include content creation (29.0%), marketing (16.1%), and sales (15.3%). The top three areas where respondents will make AI investments in the next year include operations (37.9%), customer analytics (27.4%), and market analytics (25.6%).

Table 1: AI Applications Now and Future

Q. In which of the functions below are you currently using AI, and in which do you plan to within one year (March 2024)?

AI Applications	Currently Using	Planning to Within the Next Year
Content creation (text, audio, social media, podcasts, etc.)	29.0%	20.2%
Marketing (create and evaluate marketing programs, segment target markets)	16.1%	24.2%
Sales (automate administrative tasks, score leads, forecast sales, evaluate sales personnel)	15.3%	27.4%
Cybersecurity (threat identification, protection, and response, data security/protection, predict threats)	13.7%	25.0%
Operations (predictive maintenance, quality control, supply chain/procurement management, logistics)	12.9%	37.9%
Customer analytics (evaluate customer comments, requests, behaviors, and preferences, identify opportunities to create value/solve problems, identify customers at risk of churning)	12.9%	27.4%
Market analytics (identify and evaluate target markets in terms of size, profitability, growth potential, etc.)	12.9%	25.8%
Hiring (identify, research, screen, and communicate with job applicants)	8.1%	23.4%
Employee development (create personalized training, measure effectiveness of training, measure employee satisfaction/engagement, evaluate employee performance)	6.5%	19.4%
Evaluate company performance (monitor KPIs in real time, update plans and tactics based on results)	5.6%	25.8%
Customer service (chatbots/virtual assistants to provide 24/7 support, generate customer responses to client questions/comments)	2.4%	25.8%
Risk management (identify, evaluate, predict threats such as a downturn in the economy or key market and prepare mitigation plans)	2.4%	21.0%

n=124 Print Providers

Source: PRINTING United Alliance State of the Industry Survey, First Quarter 2024

Identified AI Obstacles

Integrating AI into existing print provider operations is not without its challenges. In response to the question, "What have been your biggest AI challenges/difficulties?" State of the Industry survey participants shared the following experiences.

Defining Possibilities and Implementation

Understanding what is possible and how to link functions via technology/API have presented significant challenges. Many businesses are still in the early stages of learning how to interface with AI and identify more areas where AI can be beneficial. The learning curve to get the most out of AI is steep, requiring a lot of trial and error to understand what it is capable of and where it can be effectively implemented.

Employee Adaptation and Training

Getting employees to think about AI and find the best practices at the early stages of deployment are additional hurdles. There's a need to make the right decisions early on, which includes knowing how to implement AI and where it fits best within the organization. Learning to use AI systems and identifying systems that could benefit the company are ongoing processes that require both management and employees to adjust to new disciplines.

Trust and Validation

Learning where to trust AI and checking the output for accuracy is a continuous challenge. AI is not infallible, and it is important for companies to ensure a human is overseeing AI functions to prevent potential missteps or security concerns. Using the correct prompts to get the most out of AI is a skill that takes time to develop. Determining valid sources and vendors and integrating AI into the organization requires substantial effort and resources.

Tony Dahbura, executive director of the Johns Hopkins Information Security Institute and co-director of the Johns Hopkins Institute for Assured Autonomy, encourages companies that are implementing AI to ensure they keep a "human in the loop." Dahbura, who has also spent many years in the printing industry, having previously worked for his family's business, Hagerstown, Maryland-based Hub Labels, explains that while AI is often reliable and accurate in its outputs, it can occasionally produce unwanted results that could be damaging for a company or its customers.

"It's important in the operations, even though there's going to be increased levels of automation, [having a] human in the loop is really critical at all times," Dahbura says. "Organizations really need to, over time, structure themselves so that they can take advantage of the automation, but [ensure] they have humans in the loop at critical places in their processes overseeing what's going on, because it's very unlikely to be foolproof. If you just leave it all up to the technology, I don't think it's going to end well."

Strategic Application and Change Management

The rapid changes in AI capabilities necessitate ongoing training. Businesses face constraints such as financial limitations, talent availability, and a lack of awareness about what should be AI-assisted. Identifying and understanding other areas within the workplace where AI can be beneficial is essential, but many are still in the early stages of adoption, finding it difficult to quantify if AI results are genuine improvements or just different from previous human-only processes.

Continuous Learning and Adaptation

Keeping up with the latest AI developments is a learning process. AI is not perfect and requires continuous checking and modification. Validating information and identifying key opportunities to implement AI strategies are critical, and the establishment of guardrails and policies is necessary. For some, AI is still too new to integrate, and they are just starting to explore its potential.

Security Concerns

Security and potential legal, ethical, or moral implications of AI, such as the incidental use of copyrighted or patented material, are significant concerns. Building a closed AI environment and ensuring employees do not expose confidential customer data or company concepts and initiatives to competitors is crucial.

Practical Applications and Efficiency

Understanding how to use AI, where to use it, and how it can help businesses be more efficient and profitable is an ongoing challenge. Finding a good way to integrate AI into existing software and processes requires strategic planning and continuous effort.

As PRINTING United Alliance and NAPCO Research data indicate, many of the print service providers that have implemented AI have begun their journeys with the technology in content creation and marketing applications. Oftentimes, these are business areas that individuals within printing companies are not well-versed in. But those with AI tools at the ready can benefit from the technology's ability to interpret internal data and synthesize it into a content asset.

Karis Copp, managing director of Karis Copp Media, a B2B PR and communications agency specializing in the printing industry, shares that with AI, print businesses can reduce the time and human effort previously needed to develop quality content such as blog entries and social media posts. While it's important that a human vets any content before it is published, Copp says that AI tools can be highly beneficial for a company's internal content creators, especially in instances when they may not be experienced marketers.

"I certainly think it needs a human element, but it can be a great way of getting started," Copp says. "It can also be ideal for repurposing and maximizing content. If you're a small print business and marketing isn't top of the agenda because you don't have the time to invest in it, taking pillar content such as a guide, white paper, or longer form case study, or even just information from your website, a generative AI tool can turn that content asset into a series of social media posts, a podcast script, a video script, or a series of blogs."

NAPCO Research Survey Reports Similar Findings

Surveys conducted by NAPCO Research reveal findings similar to those uncovered in surveying the PRINTING United Alliance State of the Industry panel. A NAPCO Research survey in the field in March 2024 asked commercial printers how their organizations are using AI today and what their future plans are. As shown in Figure 2, the most cited AI uses commercial printers reported were writing marketing content (17%), data analytics (13%), email inbox management (13%), analyzing customer feedback and client interactions (12%), cyber security (12%), and trend analysis and forecasting (11%). The alarming part of this finding is the high incidence of commercial printers that have no plans to add AI.

Figure 2: Print Providers' AI Use

Q. Is your organization using artificial intelligence in any of the following ways?
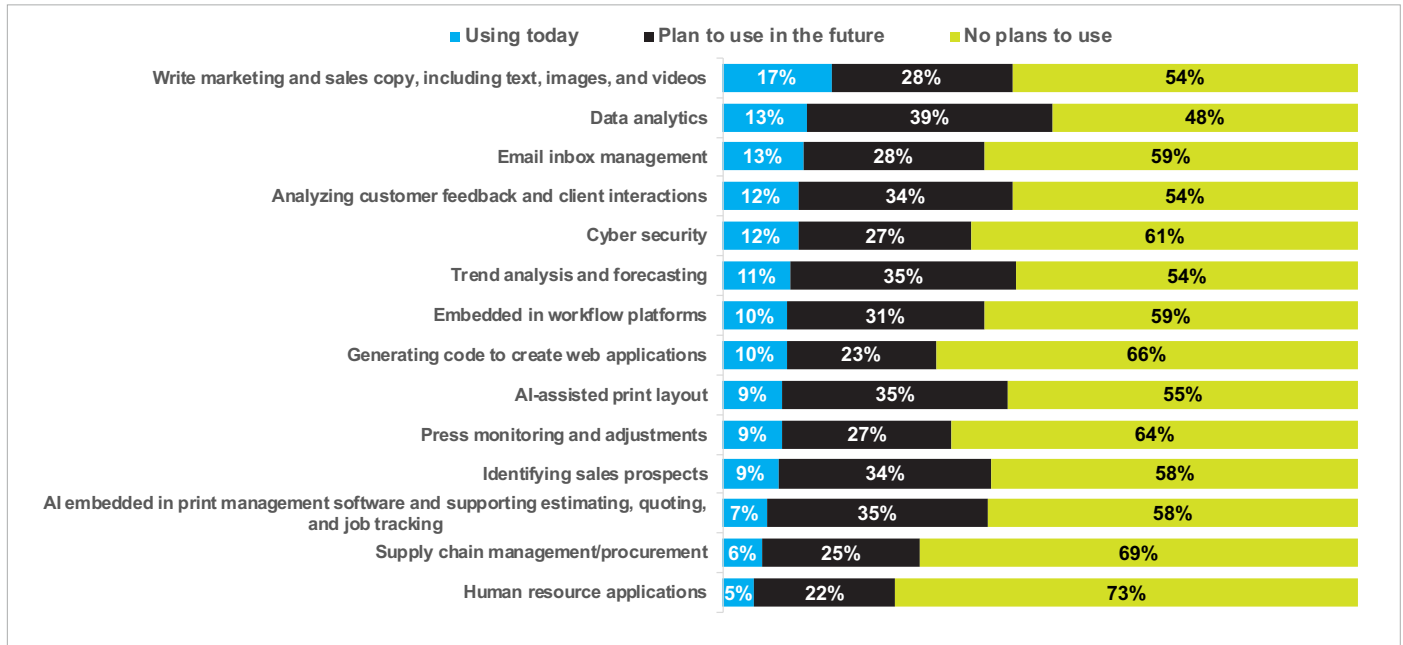
n=158 Print Providers

Source: NAPCO Research 2024

NAPCO Research regrouped the responses in Figure 2 to understand AI trends by functional area. As shown in Figure 3, print providers identified sales and marketing as the area with the most AI use today or in the future, followed by print production and operations management. Despite the high percentage with no plans to use AI, NAPCO Research expects that to change over time as commercial printers become more familiar with AI and the benefits it is delivering.

Figure 3: AI Use by Functional Area

n=158 Print Providers

Source: NAPCO Research 2024

Artificial Intelligence in the Printing Industry: The Journey Begins
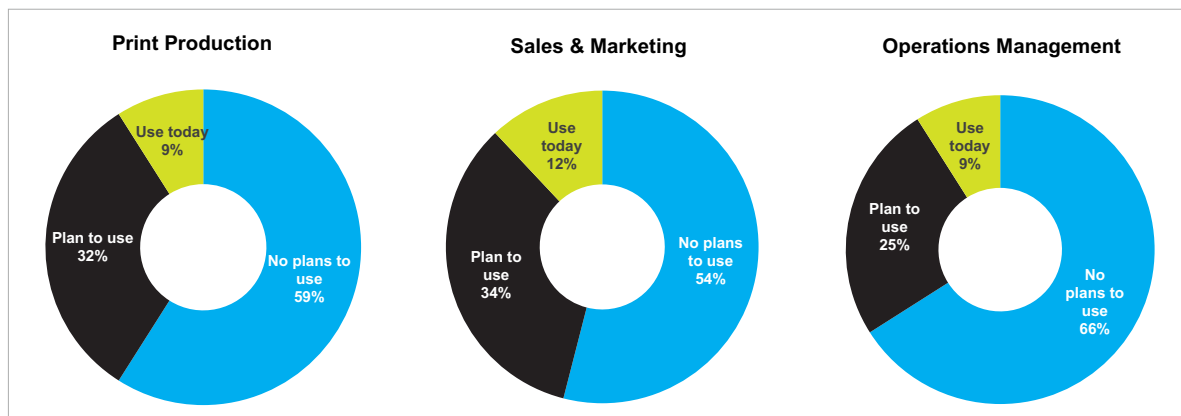
In-Depth Interviews Detail AI Status

The combined PRINTING United Alliance and NAPCO Research team interviewed printing establishments across industry segments to capture a real-world view on AI adoption and implementation. Because much of the focus of industry reporting and presentations on AI centered on how it can be used, these interviews looked to uncover ways organizations are using it today, their approaches to implementation, and their future plans. In addition, the study looked to find out the key reasons organizations were not using AI.

Here are profiles of print providers' AI journeys, grouped by type of print provider.

COMMERCIAL PRINTERS

Powering Efficiency with AI Tools

Company Focus: Commercial Printing

Annual Sales: $200 million to $250 million

Interview Participant Title: Managed Services Account Executive

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Ideation and efficiency for design, software development, and engineering tasks. Optimization of non-business hour client engagement and overall efficiency for online client experience team.

AI Difficulties: Security and potential legal, ethical, or moral implications of AI. The potential for incidental use of copyrighted or patented material or conceptual property is a concern. Building a closed AI environment and ensuring employees aren't exposing internal concepts and initiatives to competitors.

Interview Summary

This commercial printing company started learning about AI by attending AI events outside of the printing industry. Then, it implemented an internal AI oversight team to address the moral and ethical concerns with AI. During the implementation process, this team was important in communicating to the staff that AI was not meant to take over their jobs, but rather to enhance them.

AI Increasing Efficiency

Since implementing AI tools, the biggest benefit the company has realized is its increased efficiency. Some areas where the company has benefited from time savings include:

- Automating client outreach and ensuring a consistency of communication

- Leveraging automated online calculators for pricing

- Using AI for content on the website, including images

- Strategically scheduling jobs in the most optimized way, as the interview respondent explained, "We're feeding in jobs from the [company's] public site, which has 25,000 plus active customers annually, plus [100 custom branded storefronts.] All those orders are constantly coming in, so we actually built the scheduling tool that's just constantly shifting those orders as they come in and looking at dependent steps down the road."

- Job candidate screening, creating recruitment content, ad placement, etc.

The company has also implemented AI as a way to boost its off-hours coverage. Being a commercial print company, customers are interacting with its platform at all hours, so an AI-based chatbot that leverages the company's closed-data system allows customers to still interact with the company any time, even if a human is not available.

Ensuring Company Data Protection

With security, morality, and ethics as top concerns as this company implemented AI, it was important to establish the internal committee to ensure that no proprietary information or client information could enter into a public-facing AI.

"Looking at those kinds of risks, but also knowing that we wanted to move forward with it was kind of the driving force of getting the committee. If we're going to do it, let's get everyone involved and do it as a controlled group rather than just meeting once a month and telling me what you tried on your own that just might have caused a huge risk for the company. I think that's just really important because there are a lot of ethical and moral obligations you have when you're doing it. So that was really kind of the driving force behind that committee."

Some of the ways the company goes about doing this is having an employee consistently monitor the chatbot. In addition to checking to ensure the chatbot is only using data from the closed environment, chats are checked to make sure logical answers are being provided and customers are satisfied with the interaction. Since implementing the chatbot, satisfaction has increased from 60% approval to between 85% and 90%.

It has also been very important for the company to ensure that everyone using AI is following these protocols and not exposing the company to a situation in which proprietary data could be released.

"You always have the human oversight. The one main thing we've pounded down for everyone in the company is do not use public models. It's fine if you're trying to get help with writing an e-mail to a client or something to use a ChatGPT, but don't be putting client specific information in there. All of our creative and marketing, it's all closed AI environments. It's leveraging publicly available information, but it's not pushing ours back out there."

Starting with Content to Learn About AI

Company Focus: Commercial Printer

Annual Sales: $20 million to $40 million

Interview Participant Title: Executive Vice President

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Saves time generating content.

AI Difficulties: AI is smart but kind of dumb, need to rewrite a lot to get a human flavor.

Interview Summary

This commercial printer is using ChatGPT for content generation and marketing outreach (in lead generation emails), just started to use AI for estimating, and is implementing a new ERP system.

The company started investigating and testing AI about two and half years ago, when ChatGPT was launched. According to a company executive vice president, "We began using the free version of ChatGPT. Now we use the paid service and it's much more robust."

He believes the company was paying about $50 a month for the subscription. In addition, he says the company subscribes to other AI tools and is experimenting with drawing and visual imaging programs like Leonardo AI.

The executive VP uses AI for content creation and iteration, where AI starts the initial draft, but he reviews and edits it before it is released. He says the company is starting to dabble in using AI for estimating, but that initiative is still in its early stages.

AI is a big time saver for the company in creating content, he adds.

Review AI Generated Content

He explains there is a caveat when using AI for content generation, noting, "We have a policy that we never let unedited AI information get out to the marketplace without a human intervention. Because while AI is highly intelligent, it can be really stupid and not understand what the humans are trying to get it to do. So we always have the final human review."

AI Powering Website Development and Performance

The company operates a separate division that offers website development. The company uses AI in that business unit to evaluate and audit clients' websites to find out what areas site visitors use and to recommend improvement actions. AI is used to evaluate client behaviors and interactions to support creative decisions, such as the best places to include a call-to-action button to improve engagement, what colors/fonts/styles to use, and other options. In addition, AI is used to generate reports on website performance and qualify the next best steps to fix a website or do a complete reboot.

The company develops websites with the intention of leveraging the data collected to support clients in developing successful marketing plans that might include print. For example, the data on what customers are interested in on a website can be used to create personalized direct mail.

Internal Champions Advancing AI

The company has internal champions across key functional areas including marketing, sales, and operations to advance AI. A key resource for the company in learning about AI is industry conferences.

He says, "We feel very strongly about our organization learning about and using AI because if we don't, our competitors are going to pass us by."

> ## "It's the early days of AI right now, so just get started. Learn about AI and start using it."

Security is Critical

An important consideration when using AI is security. As the VP notes, "Make sure your data is secure and there's no sensitive information being used. That's why we started using AI for marketing and content applications. We're always wary from a security standpoint."

AI is used in the company's manufacturing process via its digital press and workflow software.

As for the future, the company is open to pursuing AI applications deemed secure that support efficiency, map processes, create standard operating procedures, and add value to the organization, its customers, and partners.

"It's the early days of AI right now, so just get started. Learn about AI and start using it," he says.

Small Steps to Start

Company Focus: Commercial Printer

Annual Sales: $5 million to $10 million

Interview Participant Title: President

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Starting to test the waters, not sure.

AI Difficulties: Determining valid sources and vendors. Integration into organization.

Interview Summary

This company has dipped its toes into AI to become familiar with it. Company staff has used Grammarly and its AI features to modify communications and ChatGPT to create marketing materials and produce early content drafts that are edited.

The company president reported, "We are in the middle of transitioning to Pace as our MIS and we're aware that it contains some AI functions but haven't gotten far enough in the transition to see what all these are or what the benefits will be."

In summing up the company's AI journey, the company president said, "So while intrigued and curious, we're just taking small baby steps at this point. But I do see where before much longer, AI could be more effective for us."

AI in Equipment and Software

Company Focus: Commercial Printer

Annual Sales: $5 million to $10 million

Interview Participant Title: Owner CEO

PRINTING UNITED Alliance State of the Industry Fill-In Survey Response

AI Benefits: Helps improve efficiency and productivity. Brings some skills to the table that we don't currently have.

AI Difficulties: Understanding how to use it, where to use it, and how it can help us be more efficient and profitable.

Interview Summary

This company owner reported her organization's AI experience is on its offset press, "which uses AI to continuously pursue better, shorter makereadies by adjusting to what the operator normally sets."

She also reported AI is used in prepress for "sharpening old photos, removing items that the customer is unhappy with, etc."

GRAPHIC/SIGN PRODUCERS

AI Started with an Employee Assignment

Company Focus: Graphic/Sign Production

Annual Sales: $20 million to $40 million

Interview Participant Title: President

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Making our team members more productive - elimination of repetitive tasks.

AI Difficulties: Pace of change — it's tough to stay on top of things.

Interview Summary

The company started its AI journey a few years ago by assigning a high potential, younger employee to research ChatGPT and then present findings to the company's executive team. The employee came to the executive meeting and presented ways the organization can use ChatGPT, and explained ways to write prompts.

Next, the company attempted to use different AI tools. The company president said the company experienced some success in using AI for marketing and accounts payable automation. A speech to transcription tool to document and summarize its meetings is another AI tool the company has implemented.

According to the company's president, "We were using AI to make our team members more efficient and automate some of the repetitive tasks that they do. Even before AI, every organization is trying to figure out how to improve the efficiency and productivity of their team members. We're in a very competitive industry, margins are thin and anything, any tools that we can give our team members to be a little more efficient and better at what they do offers an advantage."

Hired a Consultant to Train Staff

To advance its AI success, the company invested in having employees participate in Exponential Coaching International's 7-Week AI Sprint program. The company formed a cross-functional team of five individuals, excluding the executive team, to participate in the program that offers a blend of coaching and strategic guidance for integrating artificial intelligence into an operation.

After the program, completed in May 2024, the company president said, "Our company better understands the world of AI and how to leverage data, has a roadmap, built internal expertise, and we are taking some immediate action to help accelerate our journey. It was like a turbo-charged kick-start to prepare our business for the future."

The program educated the company's staff so they could identify ways for their organizations to use AI. Since the completion of the program, the cross-functional team began developing and working on the following initiatives:

- Change the way in-bound products are received and better manage inventory.
- Exploring the use of generative AI to reduce the time it takes to sketch concepts. Currently it takes internal artists about six hours to sketch out a customer's concept and create a 3D rendering. The company president reports there is an opportunity with AI to reduce six hours of sketching down to about 15 minutes, "as we build up our library and train AI and how to do it and give our artists a tool to become more efficient at what they do."
- Exploring ways to better collect data and using it to make more intelligent business decisions.
- Looking for ways to monetize data. For example, the company produces print for trade show booths and is investigating ways to collect data to advise customers on better booth designs.

Reflecting on the challenges in implementing AI, the company's president notes that AI can be complex because it encompasses a variety of applications and business areas.

A Game Changer and Challenge

He explained, "We all understand that AI has potentially game-changing implications for our industry and for our specific organizations, but given the pace of change, and just how technical it is, I think it's very challenging for us to understand it."

Hiring an outside firm with AI expertise to educate and guide the company's efforts expedited the company's AI learning curve and ability to leverage the best tools to start.

Offering advice to other print providers, the company's president says, "You can't sit on the sidelines with regard to AI because it is going to fundamentally change our business, so make sure you are learning about it. It isn't going away."

In addition, he attended a few AI presentations given by PRINTING United Alliance Chief Economist Andrew Paparozzi and agreed with the economist's view that whether AI is a threat to printing companies or tool for exponential growth and efficiency improvements, either way it's going to change your world.

> ## AI's potential as a game changer is understood, but given how fast things change, it's challenging to keep up and understand.

AI Uses Across Functional Areas

Company Focus: Graphic/Sign Production

Annual Sales: $150 million to $200 million

Interview Participant Title: President

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Supports the company in enhancing customer experiences.

AI Difficulties: People think implementing an AI initiative is a bigger transformation than it needs to be.

Interview Summary

The company has several different AI applications in action, but is most advanced in a program used on its telephone system to evaluate customer interactions. The company has used the AI program for two and a half years and it evaluates phone conversations between staff and customers to determine keyword phrases, subject matter, and voice intonation and inflection to rate interactions as positive, negative, or neutral.

Based on the classifications, the company will reward team members with positive interactions and dig deeper to learn more about the customer experiences deemed negative and take corrective action. The tool is much more productive than the time it takes for a person to listen to calls and evaluate conversations. The AI tool enables assessment of every single interaction.

The system can be programmed to listen for key words to identify challenges and opportunities. For example, the company can have it listen for color or quality complaints so it can make corrections.

Recently the company used it to listen for customer calls about a product defect it identified internally on a director's chair it customized for clients. The company's quality team discovered the hinges of the chairs rusted prematurely. After the manufacturer of the chair corrected the issues, the company needed to make sure that customers did not receive the defective chair. The system listened for anything related to a director's chair and heard nothing, so the company determined that the defective chairs had not reached customers.

Speaking on the value of the AI phone tool, the company's president says, "The greatest benefit is it really helps us in our employee recognition and training for our team members."

AI for Capturing Meeting Summaries

The company also uses an AI tool to record and provide objective summaries of group meetings. The company uses Fathom, an AI tool that records meetings, to provide objective summaries of group meetings.

The company's president says an important feature of the tool is, "It provides an objective capture of what was discussed and decided at a meeting. When people take notes, there can be a slant or tone based on the note taker. That is not the case with an AI tool."

AI Tools Across Functional Areas

The company's approach to AI adoption, the company president says, is "Crawl, walk, run. People think implementing an AI initiative is a bigger transformation than it needs to be. There are small things that you can do, like adding AI notetaking for meetings. That is an example of AI making staff more efficient and helping a business."

He learns about AI and tools from subject matter experts speaking at various events and reading materials on the subject and passing on that information to his staff to investigate. The company then provides various departments with AI tools to assess uses. Top management's attitude on implementing and managing is from the ground up, where department heads look for ways to use AI in their units. Here are ways the company is pursuing AI in its operation:

- **Content Marketing.** The company's marketing team is working on assessing and evaluating using AI for creating content, and investigating using it for social media interactions.
- **Graphics Management.** A significant number of larger graphic files move through the company's facility. The company is evaluating programs to be more efficient in managing files. According to the company's president, "We are looking at ways to expedite the processing and evaluation of our graphics files to optimize capacity."
- **Product and Service Profitability.** Using AI to review business data to identify the behaviors of profitable business options.
- **Forecasting.** The company is assessing forecasting tools to analyze about 15 years of documented sales history to predict purchasing trends, demand, and sales.

Take Action Now

The company president advises industry peers that want to add AI to not wait for great and accept the good available right now. He explains, "I think everyone's waiting for the "ta-da" moment where the machine comes in and waves its magic wand and our business is that much better. But the reality is taking small steps across your organization."

Take small steps across your organization today!

Stay Informed on AI

He also noted the importance of staying informed on AI. "Read books, blogs, articles, or any type of material to stay aware of what is happening," he said. "Even AI experts are still learning.

Don't think you are too late for AI, even the experts are still learning.

Journey Starts with Getting Data in Order

Company Focus: Graphic/Sign Production/Packaging

Annual Sales: $100 million to $150 million

Interview Participant Title: Chairman and CEO

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Real-time data.

AI Difficulties: Software providers and vendors limiting data access

Interview Summary

The chairman/CEO of this graphics/sign production operation discussed the prerequisites, actions, and challenges of implementing AI in manufacturing.

The first prerequisite toward creating AI-driven print manufacturing, he says "is to get your data or tech stack in order first and connect each area of the stack so information can freely flow up and down the stack and be usable in the cloud."

The company is setting up a system called a Unified Name Space (UNS), which is like a big, organized library for all its data. This system will use a method called MQTT to label each piece of data, making it easier to find and use.

UNS is a centralized, standardized, data structure that aggregates and organizes information across an organization's entire network. It serves as a universal data reference point or a "single source of truth" for all connected devices and applications. In essence, UNS acts as a repository for real-time data collected from sensors, IIoT devices, machines, and other system components, along with their context. MQTT is a standards-based protocol that enables machine-to-machine communication and is commonly used in the IoT ecosystem to transmit data.

According to the company's chairman/CEO, "This organizes the data in such a way that when the data is produced or time stamped, it can be put into an area for user access with ease."

He compares it to organizing data with the Dewy Decimal System for categorizing the data in a library digitally.

Pulling Real-Time Data

He explains, "We are pulling this data from the base machine level via edge equipment from the machine center's PLC [programmable logic controller]. We are attempting to pull any and all data permissible from the OEMs [original equipment manufacturers]. We have some simple needs for this data today, yet we have no clue what data we will need tomorrow, so we want to pull all that we can."

The company's first proof of concept (POC) is to pull data at the same time from equipment and the standards from the cost model in its ERP system. This will allow an operator to see exactly how a job is performing against what was planned. To do this, the company wrote directions in Python to tie the estimating file with the PLC to share that data in real time with the operators at the machine.

Putting the value of this POC in perspective, the company chairman/CEO says, "All too often managers perform post-cost analysis on jobs once a day, once a week, or once a month, and come back to the operator and ask them why a particular job ran well or ran poorly."

Production Data Should be Immediate

The challenge with this, he says, "Change has to be affected in the moment, not later. Our ERP system doesn't allow for us to post cost a job until all the operations are completed. This lapse does not help the measurement of the operator's performance to happen when the operator can make positive change to the job. We feel strongly that without real-time data, none of this would be possible. Data is an event and tagging the event with a protocol that enables instant recall in real time is going to take our company into the world of Industry 4.0 and 5.0, where the digital factory has arrived, and we will flourish in the future."

Building a Digital Factory

A long-term goal of the company is to build a digital factory to allow clients from other Industry 4.0 and 5.0 factories to fill their requirements by reading the company's capacity and filling it automatically with their jobs without human intervention. The chairman/CEO believes this is where the world is heading, yet the printing industry is stuck.

He says, "Many small and medium size companies in our industry, and others like it, will be sold or wiped off the map because they cannot compete with the practices of Industry 4.0 and 5.0."

After the company gets its data working up and down the data stack, its next step will be to move it to a data lake or warehouse.

Not a Quick Fix

The chairman/CEO advises that most companies are looking for quick one hit wonders to begin their journey into AI, but his company believes that the first steps are "the organization of the data, the opening of the data, and placing the data into a lake for mining to drive AI."

The company has encountered resistance from hardware manufacturers and software providers to create the data foundation it envisions. He says, "We have OEMs and software providers creating obstacles in our hunt for data."

OEM and Software Provider Data Roadblocks

On the hardware side, he reports that OEMs often limit the data that can be accessed by their machines. He says the company wants to place edge equipment on machinery to plug into a PLC to capture every bit of data on a machine, "but vendors are guarded, as they don't believe we have the safety protocols in place as well as a stable network that is cyber secure, coupled with the thought that we want to steal their many years of research and development building a machine."

The company wants to use data from its machines, explains the chairman/CEO, so it can become hyper efficient and "play in the world of Industry 4.0 and 5.0," not to make machinery.

That is the first part of the pushback the company is experiencing. The next, he reports, "Many of the newer and more advanced pieces of equipment are built with their own proprietary OS to help with some of our solution-based data collection, which is in many cases, a great feature preprogrammed to advance data and share it with the owner of that piece of equipment. That is wonderful, however it is not enough for us. We want more data."

Another roadblock is that legacy equipment may have nothing on it inclusive of a PLC. "You would be shocked to find out that even some modern hunks of equipment do not have PLCs," he reports. "So, we have to build a sensor map with the edge equipment and snag our own data."

Software providers too are creating obstacles. He says, "There are many software providers in our industry and other industries that will not unlock the silo to allow us to get at our data. Consider our experience in having to write Python directions to pull data from machines and the ERP system at the same time."

Pursuing Productivity and Employee Experience

Company Focus: Graphic/Sign Production

Annual Sales: $20 million to $40 million

Interview Participant Title: Principal and Cofounder

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Faster response times to customers for certain business tasks and labor reduction for those tasks.

AI Difficulties: Resources, awareness of what should be AI assisted, financial constraints, talent pool within the company.

Interview Summary

The company is using AI today for content creation, design, sales, and marketing applications, while exploring other areas of use. For example, it is looking to integrate AI with its accounting and production systems.

A key catalyst for its move into using AI was the launch of ChatGPT. AI tools the organization uses today include Grammarly, ChatGPT, Dall-E, and Midjourney, mostly for content creation, design, sales, and marketing applications.

AI Poised for a Larger Role

Overall, the principal and cofounder of the company reports AI implementation is in its early stages and the company is exploring options to have it play a larger role in the next year in automating tasks and providing data needed to run its business more effectively.

The company cofounder uses AI to write and respond to emails. After instructing the AI tool on the desired message and tone, he edits the AI generated copy. He explains, "AI will create the email note in seconds — saving me a considerable amount of time — then I can review and edit it to make mine."

Using AI for RFPs

Another area where the company is using AI is to complete requests for proposals (RFP). The company bids on many jobs that require the completion of complex questionnaires with hundreds of questions to provide key details prospects will consider before awarding a contract. By using ChatGPT, the company can upload the RFP questions and instruct an AI tool to fill in answers based on past RFPs. Before, the company principal reports, it used to take a staff member days to complete RFP questions by cutting and pasting past answers, compared to 10 minutes to 15 minutes using AI.

AI has been more of a time saver for the company than a game changer, but the cofounder expects that to change in the future. He says the company is using AI for writing copy, creating design concepts, and sales/marketing applications, and expects to use it to rebuild its website and power a customer chatbot.

He noted an application the company is using that has yielded significant time savings in crafting design concepts. By using prompts describing an idea, the AI tool generates options. The company cofounder explains, "Whatever the purpose, whether a client presentation deck or sales creative, these types of tools create good-enough results to convey concepts that we can edit and enhance."

Even though these tools are great time savers, the company cofounder warns that the output created must be checked and oftentimes edited. Most of the free AI image creation tools, he advises, don't have a sufficient resolution for anything other than concepting. Still, these tools offer quick results to include in client presentations to convey concepts.

Understanding AI is a Key Challenge

A key challenge in adding AI, the company cofounder says, is learning about it and staying current on changes. As a starting point, he recommended reading the book "The Business Case for AI" by Kavita Ganesan, describing it as a good primer on the state of AI.

The company's AI investments include subscribing to AI-specific tools and other software, including those from Adobe, that are AI enabled. The company wants to expand its use of AI and an internal team has been spearheading those efforts.

Using AI to Support Employee Happiness

Another generative AI-enabled tool the company uses is Motivosity, an employee experience platform that enables companies to address important moments in the employee journey. The software focuses on three of the key factors of employee satisfaction: feeling appreciated for work, being part of a community, and a meaningful relationship with managers.

The tool's AI features offer personalized guidance to employees, support managers in finding the most effective employee interactions, advise on addressing unique leadership challenges, and suggest actions to enhance work performance.

He says the tool helps to monitor morale and the emotional state of staff, so it can signal if staff members are unhappy before they leave a company.

Implement AI with Purpose

The company cofounder recommends learning about AI because it is only going to keep coming and companies need to find unique ways to make it benefit their organizations. Don't implement AI applications without a business purpose, rather, he says, "Find a specific thing, whether it's scheduling work or content marketing, and focus on that."

Going forward, the organization plans to benefit from AI in its accounting processes, customer interactions, satisfaction ratings, targeted marketing, forecasting, supply chain optimization, and more.

PACKAGING PRINTER

AI Offering Benefits, But Need More Print-Specific Tools

Company Focus: Package Printing/Converting

Annual Sales: $100 million to $150 million

Interview Participant Title: President

PRINTING United Alliance State of the Industry Fill-In Survey Response

AI Benefits: Machinery automation.

AI Difficulties: Learning how to use it to get the most benefit

Interview Summary

This company has implemented AI in its production area in multiple ways and the company president pointed to three distinct categories of the AI implementation, which include:

- **Learning from previous file prep to improve prepress processes:** Having the machine observe how jobs have been created in the past and letting the machine learn how to conduct future jobs with reduced operator intervention.

- **Machine setup:** Specifically with folder/gluer machines, the company is allowing machines to learn how to do certain setups, rather than relying on memorization of prior jobs. For example, many machines have job recall functions, in which they replicate the exact settings of a previous job. In this situation, the machine can recognize similarities to other job setups and adjust accordingly, even if it's not exactly the same. "What we're trying to do is use machine learning to say, 'OK, we've run these similar jobs before and now we have a job that maybe, it's the same style but a different size. And we want to apply the learnings from those previous jobs to this job and let the machine do an initial set up for the first-time job, not just the repeat job.'"

- **Color management:** Leveraging AI to more quickly and consistently color match specific Pantones, for example. This involves not just using the color instructions in the job file, but allowing AI to factor in ink density, the ink/water balance, etc.

The AI Journey and Implementation

This interviewee recognized that some people are intimidated or threatened by AI because they think that it will take over their jobs or make them obsolete. However, he explained that this is not the case and that the use of AI helps make people more effective and is not intended to get rid of them from the company. He said it was important to find the right people in the company's multiple facilities to be the leaders in AI implementation – those who recognize its opportunities and benefits. He also mentioned that it's important for the AI leader to have the time to dedicate to it so that it does not get overlooked in the day-to-day. "I think having a leader in it is important. Otherwise everybody has a full time job and is busy taking care of business and it doesn't rise enough to the surface to get the priority it needs."

Overcoming Educational Hurdles

The lack of print industry specific education on AI was a frustration for this interviewee. He said there are a lot of people out there that know the basics of AI, like how to use ChatGPT to write an email, for example. While that can be helpful, it doesn't really rise to the level of benefiting the business on a large scale. He would really like to see more resources available on how to implement AI into a print business to help the company operate more efficiently/effectively. "There aren't many people out there that know about how to use AI to improve color or to improve your set up times on new jobs," he says. "You have to teach yourself and you have to apply knowledge and principles. So, I would say we have a few supplier partners that have been good resources and help us and we've taught ourselves a lot."

Reasons Not Using AI

While print providers begin to test the waters of AI, there are those yet to make the move. Companies interviewed for this research that are not using AI indicated that they are not sure of its benefits, how to implement it, or are not aware of how others in the industry are using it in production workflow. The following are brief summaries of the key reasons printing companies participating in the research were not using AI.

1. ***The president of a commercial printer with sales between $5 million and $10 million*** noted how ChatGPT offers amazing capabilities in people's personal lives and has used it to write a speech. But he is not sure how to implement AI into his business. He says, "I don't understand the technology to the level that would benefit our business. If it could, for instance, read my emails and reply to customers with a quote, or track inventory levels and place orders, that would be amazing."

2. ***The vice president of operations and marketing of a commercial printer with sales between $5 million to $10 million*** believes AI is still new in commercial printing and has yet to read concise articles on how AI is being used with traditional offset printing, digital printing, bindery operations, and shipping and fulfillment. The VP said, "It needs to be defined better. I need a firm definition of what AI is for the commercial printing industry. Maybe we are using it already, and I just don't know it."

3. ***President of a commercial printing company with $1 million to $3 million in annual sales*** doesn't see any potential benefits currently to adopting AI in its workflow, but will adopt when the time is right for his company. He says "We have implemented many technological advancements. In every case the ROI has never been what the provider suggested it would be. The more dependent on computer circuitry, the less reliable the predicted ROI turned out to be. We have had to survive steep learning curves, equipment that did not deliver the product we required (this from top names in the industry), and in one case the inability of the manufacturer to ever make the equipment work as promised. We have tended to use digitally based equipment much longer than is prescribed due to the fact that if it is still performing for us as we require then the expense of upgrading does not make any sense."

CONCLUSIONS AND RECOMMENDATIONS

The adoption of artificial intelligence (AI) in the industry has begun. While adoption is in the early stages, industry executives are learning to harness its power. So far AI has been used primarily for content creation (blogs, emails, promotional materials, etc.). But if companies surveyed do as they plan, during the next year usage will increase across a range of functions, including operations, sales, customer service, market analytics, HR, risk management, and cybersecurity.

An AI benefit that will drive adoption is its ability to automate repetitive, low-value tasks. Every hour an organization saves boosts productivity and reallocates time for use on more valuable activities. One printing executive interviewed for this study explains the importance in this way: "Even before AI, every organization is trying to figure out how to improve the efficiency and productivity of their team members. We're in a very competitive industry, margins are thin and anything, any tools, that we can give our team members to be a little more efficient and better at what they do offers an advantage."

Opportunity, But Not Without Obstacles

While study participants recognize the immense opportunity AI can deliver, they reported experiencing the following obstacles in adding it to their organizations:

- Determining the best place to start
- Identifying the parts of the company that would benefit most from AI
- Evaluating and selecting the right AI applications
- Climbing the learning curve
- Integrating AI applications with ERP, MIS, CRM and other essential systems
- Preparing staff to work effectively with AI and for the changes it will create

As one executive interviewed reports, "We all understand that AI has potentially game changing implications for our industry and for our specific organizations, but given the pace of change and just how technical it is, I think it's very challenging for us to understand it."

Recommendations for Adding AI

Those companies interviewed for the research identified the following core recommendations for adding AI.

Careful Preparation Required

Tactics include creating implementation teams, hiring outside consultants to train team members on possibilities, and designating an AI champion/leader, otherwise, as one printing executive interviewed for this study said, "Everybody has a full-time job and is busy taking care of business and it [AI] doesn't rise enough to the surface to get the priority it needs." Nearly all executives interviewed agree on the importance of educating staff on how AI will enhance — not eliminate — their jobs.

Start Small and Focus on One Area at a Time

The number and variety of AI applications and options can be overwhelming. Participants in this research recommend three things.

1. Don't try to do everything at once: "Find a specific thing, whether it's scheduling work or content marketing, and focus on that."

2. Start small: "Crawl, walk, run. People think implementing an AI initiative is a bigger transformation than it needs to be. There are small things that you can do, like adding AI notetaking for meetings. That is an example of AI making staff more efficient and helping a business."

3. Rather than wait for the great, accept the good available now: "I think everyone's waiting for the "ta-da" moment where the machine comes in and waves its magic wand and our business is that much better. But the reality is taking small steps across your organization."

Continuous Learning is Essential

AI technologies are advancing rapidly. Stay current by attending AI seminars, webinars, and events, outside the printing industry as well as inside, and by reading books, blogs, articles, or any type of material. Make staying current a priority because AI is going to fundamentally change business.

Don't Forget the Human Touch

Although AI is smart, it often needs refinement to get a human touch. As one interview participant explains, "We have a policy that we never let unedited AI information get out to the marketplace without human intervention. Because while AI is highly intelligent, it can be really stupid and not understand what the humans are trying to get it to do. So we always have the final human review."

Focus on Data Security

Learning where to trust AI and checking the output for accuracy is a continuous challenge. Security and potential legal, ethical, or moral implications of AI, such as the incidental use of copyrighted or patented material, are significant concerns. Building a closed AI environment and ensuring employees do not expose confidential customer data, as well as company concepts and initiatives to competitors is crucial. Representative comments from printing executives interviewed offered the following:

- "Make sure your data is secure and there's no sensitive information being used. That's why we started using AI for marketing and content applications. We're always wary from a security standpoint."

- "You always have the human oversight. The one main thing we've pounded down for everyone in the company is do not use public models. It's fine if you're trying to get help with writing an email to a client or something to use a ChatGPT, but don't be putting client specific information in there. All of our creative and marketing, it's all closed AI environments. It's leveraging publicly available information, but it's not pushing ours back out there."

The AI Outsourcing Option

Outsourcing AI is an option for adding AI, as organizations exist that offer Artificial Intelligence as a Service (AIaaS), a cloud-based delivery model that allows businesses to access and integrate artificial intelligence capabilities into their applications and processes without needing extensive in-house AI infrastructure or expertise.

Using an AIaaS provider offers printing companies a low-risk way to experiment with AI without a large initial investment.

Appendix

Artificial Intelligence/Big Data Reading List

The sources below provide practical, jargon-free guidance for incorporating AI and big data profitably into businesses of any size and focus.

- "Artificial Intelligence for Small Business: The Complete Guide," Michael Kaput, marketinginstitute.com
- "AI for Small Business: A Beginner's Guide," Microsoft Teams, microsoft.com
- "The essential small business guide to generative AI," Stacey Hartman, godaddy.com
- "The best AI productivity tools in 2023," Miguel Rebelo, zapier.com
- "12 Tools for Small Businesses to Make Teams More Efficient," Mahima Dua, mailmodo.com
- "10 Best AI Tools for Startups & Small Businesses in 2023," Alex York, clickup.com
- "6 Ways Small Business Owners Can Get Their Employee to Use AI," Nicholas Leighton, entrepreneur.com
- "GoDaddy's AI prompt library — the best AI prompts for small businesses," godaddy.com
- "Artificial Intelligence as a Service (AIaaS)," Kinza Yasar, techtarget.com
- "Top 11 AI as a Service Companies," Aminu Abdullahi, eWEEK, eweek.com
- AI: Your Roadmap to Fuel Innovation & Amplify Profits, Harrison Painter, Harrison Painter Media
- Artificial Intelligence: An Executive Guide to Make AI Work for Your Business, David E. Sweenor, TinyTechMedia, LLC
- The Business Case For AI: A Leader's Guide to AI Strategies, Best Practices & Real-World Applications, Kavita Ganesan, Ph.D., Opinosis Analytics Publishing

Big Data

- *Big Data For Small Business,* Bernard Marr, John Wiley & Sons, Limited
- "The Smart Alternative to Big Data," Bernard Marr, fm-magazine.com
- "Building a data-driven company: the way to go for small business," Heinz Grunwald, hypergrowth.io
- "11 Tips to Become a Truly Data-Driven Company," Tom O'Neil, sisense.com
- "How to build a data-driven company," Sara Brown, mitsloan.mit.edu
- "6 steps to build a data-driven company, according to the experts," Toni Sekinah, thenextweb.com

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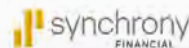## THE PRINTING UNITED ALLIANCE RESEARCH DIFFERENCE

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WHO WE ARE

PRINTINGUNITED **ALLIANCE**

PRINTING United Alliance is the most comprehensive member-based printing and graphic arts association in the United States, comprised of the vast communities which it represents. The Alliance serves industry professionals across market segments with preeminent education, training, workshops, events, research, government and legislative representation, safety, and environmental sustainability guidance, as well as resources from the leading media company in the industry — NAPCO Media. Now a division of PRINTING United Alliance, Idealliance is the global leader in standards training and certification for printing and graphic arts operations across the entire industry supply chain.

PRINTING United Alliance also produces the PRINTING United Expo (Sept. 10-12, 2024, Las Vegas, the most influential days in printing. The expansive display of technology and supplies, education, programming, and services are showcased to the industry at large, and represents all market segments in one easily accessed place.

NAPCORESEARCH

NAPCO Research 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.

Contact research@napco.com to talk with our analysts to find out how we can help you with your research needs.

Staying on top of industry trends is essential to your success.

Throughout the year, PRINTING United Alliance's research team creates top-notch reports for the industry and works with consultancies to conduct commissioned research.

PRINTING United Alliance members get unlimited access to the resulting reports that reflect the scope of the printing industry.

Visit: printing.org/library/business-excellence/economics-forecasting

If you have any questions, please contact researchteam@printing.org.

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