

TECHNOLOGY • SOLUTIONS • RESOURCES



2017  
FORECAST

*The Year  
Ahead*



winter 2017 | vol 9 issue 1 | \$199

- 4 **Now What? Post-Election and Print Market Outlook**
- 20 **Is Your Operational Waste on the Rise?**

Printing Industries of America and Its Affiliates—  
Your National and Local Resource



Find the next generation of print staff with **Open House Recruiting.**



Marrying the latest techniques in virtual recruiting with traditional face-to-face hiring, **Open House Recruiting** is a modern hiring solution for printers.

Whether you need to just fill one position or would like to start a continuous recruitment program, **Open House Recruiting** has affordable and accessible solutions for businesses of all types and sizes.

 Visit [www.openhouserecruiting.com](http://www.openhouserecruiting.com) to learn more!





Printing Industries of America  
 301 Brush Creek Road  
 Warrendale, PA 15086  
 Phone: 412-741-6860  
 Fax: 412-741-2311  
 www.printing.org

**Winter 2017 | Volume 9 | Issue 1**

The Magazine—ISSN: 1947-4164

Editor: Joe Deemer  
 Publisher: Julie Shaffer

**Printing Industries of America Staff**

President and CEO.....Michael Makin

**Printing Industries of America Board of Directors**

Chairman.....Curt Kreisler,  
 Gold Star Printers  
 First Vice Chairman.....Bryan T. Hall,  
 Graphic Visual Solutions  
 Second Vice Chairman.....Michael S. Wurst,  
 Henry Wurst, Inc.  
 Secretary.....Paul Cousineau,  
 Dow Jones & Company, Inc.  
 Treasurer.....John E. LeCloux,  
 WS Packaging Group

*Printing Industries of America: The Magazine* is published by Printing Industries of America, a member-supported, nonprofit, scientific, technical, and educational organization dedicated to the advancement of the graphic communications industries worldwide. A subscription to the magazine is included with every affiliate membership. Nonmember subscriptions are \$200 per year for subscribers in the U.S. and \$300 for those outside the U.S. Single copies are \$15 except for the *Forecast* issues, which are \$99 for members and \$199 for nonmembers. To subscribe, order single copies, or order the *Forecast*, call 800-910-4283, fax 412-741-2311, or visit [www.printing.org/store](http://www.printing.org/store). For complete membership information, please email [membership@printing.org](mailto:membership@printing.org).

The contents of the *The Magazine* are copyrighted and the property of the foundation; they are not to be quoted or reproduced without prior written consent. Mention of commercial products does not constitute endorsement. Bylined articles represent the opinions of the authors and are not necessarily those of Printing Industries of America.

Send manuscripts and news for potential publication to:

Kayleigh Smith  
 301 Brush Creek Road  
 Warrendale, PA 15086  
 Phone: 412-259-1713  
 Fax: 412-741-6860  
 Email: [ksmith@printing.org](mailto:ksmith@printing.org)  
 Manuscripts may be peer reviewed.

Powered by



# MAG THE MAGAZINE

## WELCOME



### Publisher's Message

For the past couple of years, Printing Industries has experimented with publishing the bi-annual *Forecast* issues of *The Magazine* in digital format only. I am pleased to announce that, starting with this Winter 2017 issue, we've returned to printing every issue of *The Magazine*, including the *Forecast*. While we will continue to offer a digital version of *The Magazine*, as the world's largest printing industry association, I believe it's important to offer our flagship publication in print format.

In this *Forecast*, several authors address how some of the sweeping changes anticipated with the new U.S. presidential administration might impact the printing industry. You will find articles from Ronnie Davis, Senior Vice President and Chief Economist, Printing Industries of America, Adriane Harrison, Human Relations Specialist, Printing Industries of America, and Mark Hammond, President, Land Air Water Legal Solutions LLC, that address the kind of change we may see in the areas of labor relations, healthcare, environmental regulations, and business taxes.

Of course, technology is always a major part of our forecast issues. You'll find articles on what one major industry player calls "Industry 4.0;" the ever-improving industry standards; workflow advances in digital, flexo, and offset printing; and how business owners might respond to disruptive digital technologies. Phil Snyder and Karen Snyder of the University of Houston explain the concept of transmedia storytelling and reveal how this meshing of different messaging media, including print, builds a unified communication experience that is very much the wave of the future.

You'll find all this and more as we look to the future in the winter edition of *The Magazine: Forecast*. As an added bonus, many of the stories feature links to supplementary online content so you can explore related topics in more detail. Whether you're reading this issue on the printed page or on a digital device, I hope you enjoy the Winter 2017 *Forecast*.

*Julie Shaffer*

**Julie Shaffer**

Vice President, Education & Marketing Strategies, Publisher,  
*Printing Industries of America: The Magazine*

# CONTENTS

---

## Industry Insights

- 4** **Now What? Post-Election and Print Market Outlook**  
Ronnie H. Davis, Ph.D.,  
*Printing Industries of America*
- 6** **HR Outlook: What to Expect in 2017**  
Adriane Harrison,  
*Printing Industries of America*
- 7** **The War for Talent: Did You Build the Right Recruiting Process?**  
Brian Regan, *Semper International*
- 8** **The Future of Environmental Regulations**  
Mark Hammond, Esquire,  
*Land Air Water Legal Solutions LLC*
- 10** **2017 Business Transition Planning**  
Larry Grypp, *University of Cincinnati's Goering Center for Family & Private Business*
- 12** **All Eyes on a Digital Future**  
Dan Marx, *Specialty Graphic Imaging Association (SGIA)*
- 14** **Driving Efficient Flexo: Printers Strive to Reduce Touches**  
Robert Moran,  
*Flexographic Technical Association*
- 16** **Agencies that Print**  
Jenn Strang, *Printing Industries of America*
- 

## Operations

- 18** **Workflow & Operations Assessment**  
Dillon Mooney, *Printing Industries of America*
- 20** **Is Your Operational Waste on the Rise?**  
James A. Workman,  
*Printing Industries of America*
- 22** **OSHA Update: New Electronic Injury and Illness Data Reporting Rule**  
Gary Jones, *Printing Industries of America*
- 24** **Sustainability Certification: Does It Make a Difference in Print Manufacturing**  
George B. Glisan, Ph.D.,  
*Appalachian State University*
- 

## Technology

- 26** **Industry 4.0**  
Dr. Mark Bohan, *Heidelberg USA*
- 28** **Connecting the Market: NFC Spurs Changes and Variations in Printed Media**  
John Bodnar, *Printing Industries of America*
- 29** **Ingredients for Better Variable-Data Printing**  
Jon Hall, *Printing Industries of America*
- 30** **Enhancing Transmedia Storytelling**  
Phil Snyder and Karen Snyder,  
*University of Houston*
- 32** **M3 Is for Controlling Metallics**  
Martin Habekost, *Ryerson University*
- 34** **Measuring OBAs**  
Christopher Smyth, *Ryerson University*; and  
Gerry Gerlach, *Idealliance Print Properties Committee*
- 36** **Forecast for eLearning**  
Sam Shea, *Printing Industries of America*



# 2017 Premier Print Awards

HONORING EXCELLENCE IN GRAPHIC COMMUNICATIONS

Start gathering your printed pieces for the most thrilling, global industry competition.  
Entries accepted beginning February 2017.



**Early-bird Deadline: April 21, 2017**  
**Entry Deadline: May 19, 2017**



Visit [www.printing.org/ppa](http://www.printing.org/ppa) for important dates and entry information.

# Now What?

## Post-Election and Print Market Outlook

By Ronnie H. Davis, Ph.D., Senior Vice President and Chief Economist, Printing Industries of America



Now that the election is over, it's time for a fresh assessment of the direction of the economy and print markets. First, the obvious question—do the election results matter for the economy and print? The answer is “Yes!”

While the fundamentals of the economy remain constant, new political priorities impact the economy and various industries in incremental yet significant ways.

### Trumponomics 101

Based on campaign rhetoric, there are three key policy areas that likely will impact the economy in the short term (2017–2018):

- **Regulatory reform**—rolling back and easing of various business regulations
- **Tax reform**—particularly corporate taxes
- **Stimulus**—spending on infrastructure

Three other policy priorities may take a little longer to develop beyond 2018:

- **Trade policy reform**

- **Monetary policy reform**—return to normalcy and slightly higher interest rates
- **Competitive policy changes**—antitrust enforcement

So how will these impact the economy? There are many unknowns as to what might actually happen and which campaign promises will be kept. The early consensus among economists calls for slightly higher growth in GDP and somewhat higher inflation and job growth. My own assessment is on the upper end of the consensus for each of these variables.

### The 2017–2018 Economy

The current economic expansion is now eight years old—one year beyond the average total length of the 11 post-war expansions, making it the eighth oldest. Does it have any life left? I believe the answer is yes for two main reasons. First, as discussed above, the Trumponomics policies should add some vigor to the previous trajectory. Second, the three longer expansions actually had higher average growth rates, so longer-run expansions need not be weak expansions.

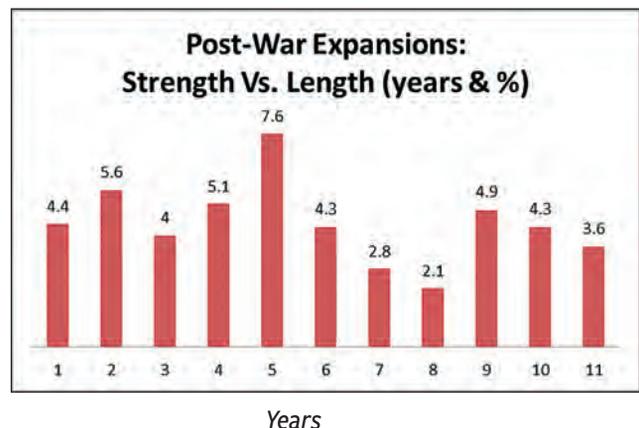
## WHAT TO EXPECT

### In 2017

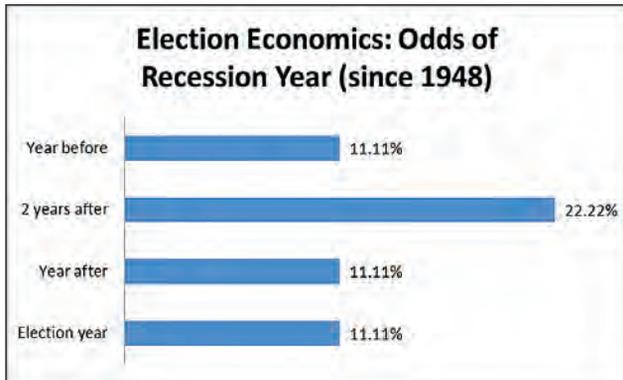
Stronger economic growth and an increase in print sales by around 2.0%.

### For the Next Few Years

Reduced business regulations, business tax reductions, infrastructure spending increases, and continued 2.0% growth for print.



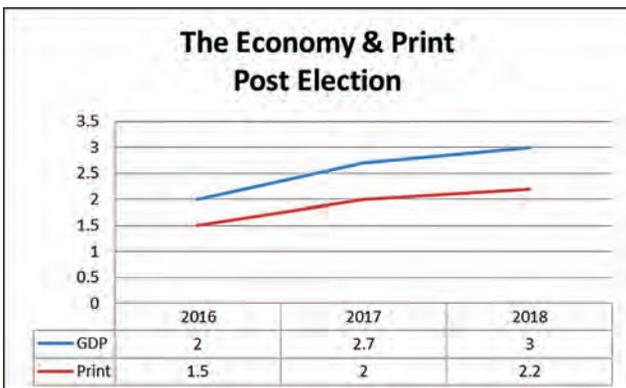
On the negative side, historically the second year after a presidential election (in this case 2018) has had double the risk of recession than the other three years of the cycle. This correlation adds a bit of jeopardy to our forecast. However, the odds still favor the continuation of the expansion.



All things considered, I believe the expansion should continue into 2017 and 2018. Additionally, the economy will likely pick up speed from regulatory and tax reform plus some possible fiscal stimulus. The bottom line is GDP growth in the range of 2.7 to 3.0%, a significant jump from the expected 2.0% in 2016.

### 2016-2017 Print Markets

Print markets will, of course, be helped by the bump in the economy. There will be some downward pressure because of the drop in election print, but the upswing in the economy should offset this. Our expectations are for print markets to grow nominally (including print inflation) at a rate of 2.0 to 2.2% over the next two years.



At this rate, print markets will add about \$3 billion in additional sales in each of the next two years. This rate of sales growth should sustain the current 3.0% profit rate on sales earned by the average printer and the 10.0% earned by industry profit leaders (those in the top 25% of profitability).

*“The early consensus among economists calls for slightly higher growth in GDP and somewhat higher inflation and job growth.”*



**Clean Your Database with this Member Benefit**



**Eligible members receive special pricing deals on...**

- List building services
- National Change of Address Processing
- Second Generation Sequence File Processing (DSF2 Link Processing)

[www.printing.org/bbdirect](http://www.printing.org/bbdirect)

# HR Outlook

## What to Expect in 2017

By Adriane Harrison, Human Relations Specialist, Printing Industries of America



Over the next two years, President Trump and the new Republican-controlled Congress will have the ability to shape labor and employment policy in dramatic ways.

### **NLRB Vacancies and Rulings**

The quickest changes will be seen in the area of labor law. The National Labor Relations Board (NLRB) is comprised of five Members who serve in a quasi-judicial role to review cases that have been decided by administrative law judges under the National Labor Relations Act.

Vacancies on the NLRB, both current and future, will have a major impact on labor law interpretation. Right now two Member seats are empty and two more will be empty in the next two years. That means four of the five NLRB Members will be Trump administration picks. In addition, the term for the current General Counsel to the NLRB will expire in 2017, opening another position with significant influence on labor policy.

So, what does this mean? The recent labor-friendly decisions that came from the NLRB may end quickly. Within the next two years, the recently blocked Persuader Rule will be gone completely. The expanded Joint Employer doctrine will revert to the former, unexpanded status. Also look for other union-friendly decisions to be reversed. The Quick Election rule will be rescinded, increasing the time between organizing and elections. Employers will likely no longer be required to provide email addresses to organizers. In addition, the “micro unit” decision—that specifically

dealt with printers—will probably be reversed at the earliest opportunity. That case allowed the shop floor to be gerrymandered so that a group of workers who were against unionization were cut out of the bargaining unit. Expect that to change in the future.

### **Fight for \$15**

Expect President Trump’s nominee for Secretary of Labor, Andrew Puzder, to argue against any federal minimum wage increase. While there is no word about how Mr. Puzder feels about the Fair Labor Standards Act overtime rule changes, it is a fair guess that he is not in favor of the 100% increase to the threshold salary for exempt employees that would have taken effect on December 1. President Trump has not completely abandoned some sort of increase but has suggested a delay or carve-out for small businesses.

### **Health Care**

Repeal of the Affordable Care Act is already under way, and new legislation is planned to replace it. Premiums will go down as risk pools are diversified and insurers are allowed to sell across state lines. It seems likely that the most popular aspects of the ACA will be written into new legislation, such as maintaining the pre-existing condition provisions and the ability for adult children to remain on their parent’s policy until age 26.

At least one law benefitting employees will likely be proposed by the Trump administration. President Trump’s daughter, Ivanka, is an advocate for paid maternity leave for women who have given birth, and President Trump supported paid maternity leave as part of his campaign platform. Look for this to happen through the unemployment insurance process.

---

# The War for Talent

## Did You Build the Right Recruiting Process?

By Brian Regan, President, Semper International



There is a war for talent happening right now. It impacts many facets of our economy. The printing industry is seeing it mostly in the specific trade positions. To be blunt, it's hard to find skilled bindery and press operators. The talent drought is evident in

other positions, but there is an epidemic shortage with bindery and press operators.

As this article is being written, the unemployment rate has reached the national level of a whopping 4.7%. Unfortunately, this issue will be continuing into and past 2017 barring any significant global issue (war, bubble burst ... housing?).

Talent pipeline building has been the buzzword for some time. The use of online tools to gain the eyes of potential employees has exploded. This trend is booming on professional networks like LinkedIn, niche job sites like the PIA Job Bank, and job aggregate sites like Indeed and Zip Recruiter—as is using all these avenues to harness the potential applicants into an applicant tracking system (ATS).

These tools, when properly deployed and managed, can have a powerful impact on how a firm attracts talent. While not all firms hit the nail on the head, many do have the fundamental systems to gain some traction on growing the talent pipeline.

There is an important piece of the talent procurement process that has eroded in relation to the hard-to-find skilled tradesperson. It is the ease of the process and, more important, the way they are engaged by a firm.

### Limited Access to Technology

Addressing the first issue, many of these people do not live their lives in front of a computer. With mobile technology rapidly consuming their online time, it's unclear if they ever will use computers as much as a highly technical talent pipeline process requires. This creates the potential for lost talent.

The advertising may gain their eyes, but the application process frustrates and loses them. The process may be simple for companies to track candidates but not enticing enough for the talent to go through the online applicant process.

A strong talent pipelining strategy backed by a solid ATS is recommended, but a firm must dig deeper. The human side of relationship building and working with the talent through the process is a piece largely overlooked when building these online-to-ATS processes. *Who* is calling the applicant? Are they able to excite and motivate the person to join? Let's not forget, we have only recently come out of a devastating recession. Many firms and recruiters are still used to a talent-rich environment. If your systems are designed from the perspective of high talent availability, it may not be best suited for the current low-talent-availability market.

### The Human Touch

Review your current process and focus a critical eye on how you are attracting talent and what you are doing after you gain their attention. Make sure you don't lose the right skilled person because of your process. Dig through the steps. Look at where the applicants are dropping off in the process and create a *human* solution. Add in more human-to-human interaction to ensure you keep those hard-to-find people engaged and motivated to join you.

# The Future of Environmental Regulations

By Mark Hammond, Esquire, President, Land Air Water Legal Solutions LLC

INSIGHTS



President Trump made several bold, sweeping pronouncements about the role the United States Environmental Protection Agency (U.S. EPA) and other federal agencies should play in the regulation of manufacturing and business. Sifting through the

rhetoric, what will drive future environmental and related regulatory efforts, and what specifically does the future hold for U.S.-based printing operations? Is past performance indicative of future returns, or will the federal government truly operate in a completely different manner, as promised during the campaign?

President Obama began his presidency with majorities in both the Senate and House, and three major policy goals—health care reform, financial regulatory reform, and climate change legislation. Eight years later, President Obama left office without ever having a climate change bill reach his desk. Why? Competing visions for such a bill amongst the president and other leaders from his party in Congress.

President Trump will face the exact same problem—competition from his own party's Congressional leaders for establishing legislative priorities and the specific details of any legislation that is introduced. Without strong prior relationships with Congressional members of his party, and the inherent resistance to presidential pressure that Senators have due to their staggered, six-year election cycle, President Trump may find the law-making process to be considerably more difficult than expected.

## Immediate (2017) Federal Outlook

The Clean Power Plan, which creates an intrusive regulatory scheme for reduction of greenhouse gas emissions from electric power production, will die, although the precise cause of its death has yet to be determined. The more interesting issue will be what comes next for greenhouse gases (GHG)—presidential direction to U.S. EPA to halt development of all GHG related regulations, a legislative override of *Massachusetts v. U.S. EPA* and/or the “endangerment finding,” or something completely different. In all likelihood, if and how GHG emissions will be regulated at the federal level will be a contentious issue for the next several years, with the major battles occurring during the first year of the new administration.

In terms of existing federal environmental regulations directly affecting printers, there will be no meaningful short-term developments. U.S. EPA is a large bureaucracy staffed by solid professionals, and other than two or three large national issues with significant energy and economic components (e.g., GHG emissions from power plants and/or automobiles, natural gas and oil pipeline development), there will not be noticeable changes in U.S. EPA's existing implementation of regulations generally or anything affecting printers specifically.

## Short-Term Federal Outlook

In the next two to three years, expect a decrease in overall federal environmental enforcement issues, no (or slow) development of new regulations, and a greatly increased emphasis on economics in the development of those regulations that do go forward. Should the new administration be more successful than widely expected in implementing its agenda, the beginning of a rollback of so-called “job killing”

The Magazine

8

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017

existing regulations may actually occur. This will have the unintended consequence of increasing the activity level of environmental advocacy organizations, including litigation. On the energy front, expect to see a very significant change in direction regarding the federal government's role in pipeline development and other energy issues, which should lower energy costs for manufacturers and printers—especially those with large thermal needs (i.e., heatset printers).

### Long-Term Federal Outlook

Developing federal environmental regulations and policy can be thought of as falling into two categories—mandatory duties that fall within narrowly proscribed limits that have been established in statutes and legislation, and more discretionary duties that fall within increasingly unbounded ranges under general authorities granted by statute and legislation. Clearly, this administration (and the current Congress) will push U.S. EPA to hew much more closely to exercising only its mandated duties and to develop

policies and regulations only when clearly required by law and with the minimal impact on economic development. Having said this, changing the culture of U.S. EPA will be very difficult, even over a long time frame. Most likely, U.S. EPA's mid-level staff and policy developers will continue to value environmental protection much higher than economics, and while the biggest issues will get a high level of administration oversight, the myriad smaller issues may not, especially in areas of enforcement and regulatory implementation.

As a general guideline, environmental regulation of printers (and especially lithographers) is driven more by state agencies. Health and safety regulation is driven more by federal agencies. The Trump administration, if it achieves its stated goals, will reduce regulatory requirements on manufacturers and business, but—at least toward printers—these impacts will be primarily in areas other than environmental protection.



**IS YOUR LATEST IMPROVEMENT PROJECT STALLED?**

Contact expert, third-party consulting from the Center for Technology and Research.

**We're here to help with:**

- Digital
- Color Management and Prepress
- Business Management
- Production Operations
- Plant Layout
- Press Testing and Equipment
- Acquisition
- Lean
- Sustainability

Contact an expert today at [consultinggroup@printing.org](mailto:consultinggroup@printing.org).



---

# 2017 Business Transition Planning

By Larry Grypp, President, University of Cincinnati's Goering Center for Family & Private Business

INSIGHTS



At the Goering Center we are working with private and family businesses across the spectrum to plan and prepare for the changes 2017 will bring. Knowing many in the printing field, we understand that most of your businesses are private and family-owned and

operated. Statistics show that many family businesses in particular will experience some form of ownership transition within the next five to ten years, and the printing industry overall is no exception to this pending change.

It is estimated that over 40% of family business leaders in the next few years expect to retire, leading to either succession, sale, or merger of the business. The mean age of family members in control of the family business in 2017 will be 60.2 years, and thus transition is coming.

According to a *First Research* Study, the printing industry in the U.S. includes around 35,000 companies with an estimated \$90 billion of annual revenue. The majority of these printers are small or midsized businesses that operate one production plant, employ fewer than 20 people, and have annual revenue under \$5 million. The majority of these smaller businesses are family-owned and family-managed.

Having a contingency plan for change is paramount in any business. Be it sale, merger, or succession, many family businesses, not just printers, will be

---

## WHAT TO EXPECT

### In 2017

Firms should consider initiating a contingency, transition, or succession plan. As more baby boomer business leaders near retirement age, the question will be asked: "What's next for the business?"

### For the Next Few Years

For the printing industry, as a microcosm of the overall family business world, many firms will most likely have to deal with some form of ownership transition within the next few years.

forced to deal with some form of transition in the upcoming years. I can share that a vast majority of all family-owned businesses would like to pass the business to their next generation. However, fewer than 30% of those family-owned businesses will successfully do so.

Still, as with many of my constituents, if keeping the business in the family is the goal, then you need to start planning now. 2017 will be the time to initiate a plan, select a successor(s), and outline the priorities needed to strategically pass the business to the next generation. Your first move is to open the discussion and understand that your business is not alone.

*If you need assistance with transition planning, visit [www.GrowYourFamilyBusiness.com](http://www.GrowYourFamilyBusiness.com) where you can find information on starting and developing your business plan for the future.*

The Magazine

10

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017

# Heraeus



## Need a lamp?

## Talk to us.

**At Heraeus Amba®: We understand lamps!** We offer a complete range of UV lamps for efficient printing processes. Whatever you need, the answer is always the same: Amba®. We make the best lamp for your curing equipment, and wherever you come from, we'll make it easy and convenient for you to find the UV lamp you need.

**Heraeus Noblelight America LLC** Gaithersburg, Maryland 20878-1357, USA  
Phone + 1 301 527 2660 · [info.hna.uvp@heraeus.com](mailto:info.hna.uvp@heraeus.com) · [heraeus-noblelight.com/amba](http://heraeus-noblelight.com/amba)



# All Eyes on a Digital Future

By Dan Marx, Vice President, Markets & Technologies, Specialty Graphic Imaging Association (SGIA)



Printing is in a long, drawn-out process of conversion from analog to digital technologies. While the amount of analog printing—be it offset, screen printing, flexography, etc.—represents a majority of the print done today, one cannot discount the

approaching, profound change.

The foundation of SGIA's membership and technology base is in display graphics and signage, where wide-format digital technology has revolutionized the way these product segments are designed, produced, and delivered. Digital technology—primarily inkjet technology—has not only replaced its analog predecessor, but has also facilitated the creation of new markets, product areas, and applications.

For some, like graphics and signage producers, digital technology is not new. It is now the primary technology for this segment. For others, digital printing technologies are just beginning to establish a foothold. Developments in inkjet technology, particularly where it has delivered higher print speeds, are bringing long-discussed possibilities into the realm of today. In the past couple of years, single-pass inkjet systems have been introduced that offer a competitive alternative for some publication printing. That, coupled with the fact that target marketing has resulted in shorter run lengths, even increases the competitiveness of the opportunity.

The same holds true in the printed packaging industry, where several equipment manufacturers have introduced (or will) full-color, single-pass sys-

tems for corrugated packaging. These systems will deliver the same benefits—short runs, full color, simpler process, lower labor costs, less inventory—to an area ripe for change. While most printed packaging produced today is done using analog methods, most print professionals in this industry segment can see the profound changes digital printing will bring, not only to corrugated, but also folding carton, flexible packaging, and other areas.

The timeline for analog-to-digital changeover in different industry segments is variable depending on the “readiness” of the technology, the receptivity to change among those using the analog systems, niche opportunities, or increased margin. In the display graphics and signage segment, the changeover took nearly fifteen years. In the ceramics segment, the changeover took about two years, driven by shorter runs, higher customization, just-in-time delivery, and eliminating the need for overproduction. Further, these devices integrated efficiently into existing production lines. Over time—and at different speeds—other industrial segments requiring the decoration or marking of parts will follow the path of the ceramics industry.

Printing is actually much broader than most printing professionals consider it to be. Some of the technological changes that will profoundly affect what we do today—and tomorrow—may be taking place in other segments we don't know and may never serve. What the printing industry does will continue to change. The result—an industry that is less a craft and more a science. Less a skill and more a process.

*Dan works to raise awareness of existing and emerging imaging technologies and helps printers and their customers identify and adopt new technologies as a way to access lucrative market areas. Contact him at [dan@sgia.org](mailto:dan@sgia.org).*



# RAPIDA 106

## World's Fastest Press

KBA presses bring you many profitable solutions, whether you are in packaging, commercial, or digital printing. From our makeready speeds, simultaneous processes, highest print quality, and the ability to print on the widest range of substrates KBA presses stand alone.

KBA North America | Phone +1 (800) 522-7521 | [na-marketing@kba.com](mailto:na-marketing@kba.com) | [kba.com](http://kba.com)



# Driving Efficient Flexo

## Printers Strive to Reduce Touches

By Robert Moran, Publisher, FLEXO Magazine, Flexographic Technical Association (FTA)



Shorter runs, intricate graphics, faster speeds, and more eco-friendly operations will define the flexographic industry of the future. Given today's intensely competitive environment, reduced changeover times, leaner operations, and adaptation of contin-

ually advancing technologies will prove essential in continuing to innovate.

In flexographic printing circles, the focus is on efficiency. The end goal remains higher print quality at lower fixed costs. Talk constantly turns to asset management. Everyone is intent on improving service, managing workflow to accommodate just-in-time delivery, complying with new packaging content regulations, and expanding finishing options.

Priorities range from optimizing processes and dispelling waste to expanding capabilities, escalating productivity, and boosting profitability. Long-term goals stress enhancing speed to market, realizing faster makereadies and quicker setups, and delivering repeatable color and ever predictable outcomes.

A significant portion of Flexographic Technical Association (FTA) printer members are voicing expectations of significant sales growth in the next twelve months. Most indicate business will improve somewhere between 5 and 10%, while some believe big boosts in volume—better than 10%—are possible.

Delving into more unique aspects of the operating environment, one printer offers, "I see a lot of business transitioning to flexo. We are traditionally

a gravure shop that just started flexo." Another comments, "We're expanding into new markets. We are very diversified and provide all types of packaging for our customers."

What's driving the future of flexographic printing? FTA printer members cite technological advances, multiprocess combination printing, sustainable practices, automated workflows, food safety guidelines, regulatory/compliance issues, statistical process control, and Flexographic Image Reproduction Specifications and Tolerances (FIRST) and other standards and specifications.

One explains, "Through standards and specifications, flexo has become a printing method with a scientific process behind it that allows products to be printed consistently and repeatedly from run to run." A second points to technologies, such as electron beam (EB) printing, and says it "has potential to eliminate the lamination process for several food products." That observation is frequently reiterated. One printer declares, "Automated processes translate into printing advances." Another notes, "Efficiency and quality are the forces that will separate the strong from the weak."

### Next Moves

Plans to maintain and build on momentum hinge on training and skills development as the number-one strategic direction among FTA printer members. Advice is specific and based on personal experience. "We are increasing our training commitments and investing in technology that improves efficiency and quality." Another one of FTA's most engaged printer members urges peers to, "Get more output in the same amount of time with training and accountability."

## WHAT TO EXPECT

### Immediate Assessment

- Flexographers see significant sales growth in 2017—the vast majority expect a 5–10% increase in volume.
- Packaging's share of print market pegged at over 40% with flexography responsible for 77%.
- Pundits see 5–6% annual growth, 2017–2020.

### Short-Term Outlook

- Multi-process combination printing, sustainable practices, automated workflows, Lean manufacturing, and food safety guidelines impact production.
- Statistical process control boosts quality while ensuring predictability and repeatability.

### Take on Tomorrow

- Package printing sales forecast at hundreds of billions of dollars. Most optimistic analysis says 2020 sales will approach \$998 billion–\$1 trillion.
- Flexography's share of packaging market is seen at 75%.
- Reinvestment is key.
- Focus on training and skills development remains top priority.

Still others were more specific when it came to next steps. “We’re purchasing a digital press.” Someone else hints at migrating increasingly into flexible packaging, shrink sleeves, and high-end wine and spirit labeling. Many, many more voice this pledge, “We will fill the press we have, then get another.” A final piece of cautionary advice is, “Don’t get caught with outdated software and hardware. Stay on top!”

*Flexographic Technical Association (FTA) is a professional society dedicated to bringing all members of the flexographic printing community—printers, suppliers, consumer product companies, institutions, prepress houses and others—together by providing opportunities for the free exchange of technical ideas, discussion of mutual concerns, and positioning of flexography as the printing process of choice within the global packaging community. It is a proponent of maintaining and advancing quality standards and includes 1,500 member sites employing more than 60,000 individuals.*



## 2016-2017 Dynamic Ratios Reports

Start financially benchmarking your company against others in the industry when you purchase one or more of the 2016-2017 *Dynamic Ratios* Report Volumes.

**Vol. 1** Management Guide to the Dynamic Ratios

**Vol. 2** All Printers by Sales Volume and Geographic Area

**Vol. 3** All Printers by Product Specialty

**Vol. 4** Sheetfed Printers by Sales Volume and Geographic Area

**Vol. 5** Web Offset Printers and Combination Offset Web/Sheetfed Printers

**Vol. 6** Printers with Sales Over \$22,000,000

**Vol. 7** Printers with Sales Under \$4,000,000

**Vol. 8** Digital Printers

**Vol. 9** Commercial and Advertising Printers

**Vol. 10** Binders

**Short Form Summary Report**

Learn more at [www.printing.org/ratios](http://www.printing.org/ratios)

# Agencies that Print

By Jenn Strang, Senior Marketing Manager, Printing Industries of America

INSIGHTS



For the last several years printers have been encouraged to become marketing service providers, most notably in our own publications and learning events. So it shouldn't come as a surprise that some marketing firms have recognized the same

opportunity and decided to move into the printing marketplace.

One such example can be found in Pittsburgh-based branding and design agency, Nium, Inc. The company recently celebrated its 15th anniversary with an open house and tour of the 148 year-old former friary that they call home. A featured stop on the tour was the agency's in-house digital production studio.

"The production studio came out of a desire to service our clients as best as possible," said Bill Stabnau, President of Nium, Inc. "We saw this as a means to create wins for both sides."

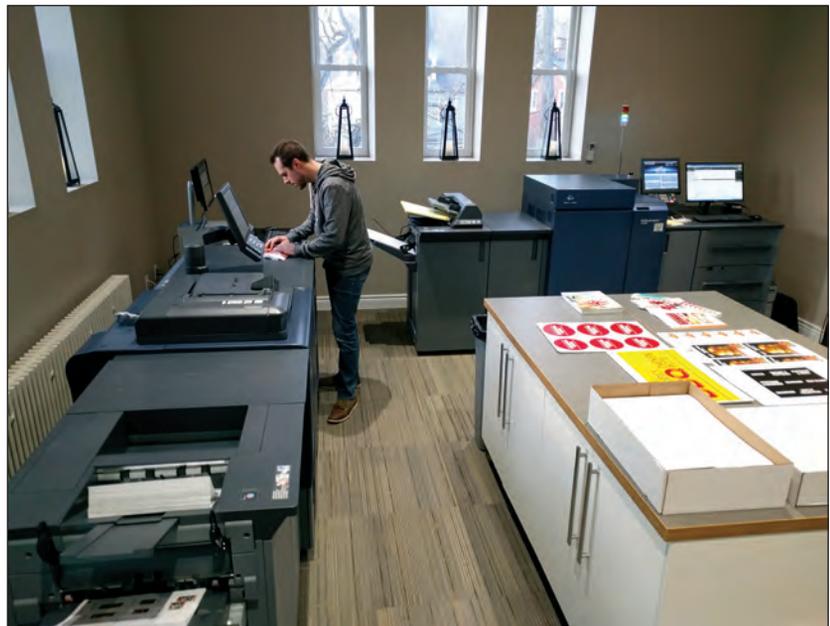
Nium's foray into print began small with wide-format printing of products such as menu boards and point-of-sale signage. Over time, the company expanded its breadth of deliverables as a means to meet client's needs. Today, the print studio is home to two digital presses, three large-format machines, and a wide array of finishing options. The recent addition of an eco-solvent plot/cut plotter allows for

inline diecutting of materials to produce customer clings and decals. Nium's client list includes Allstate, Bruegger's Bagels, Pearl Valley Cheese, and Sbarro.

Stabnau cited one of the benefits of an internal facility is the ability to test and create samples. "Having the equipment in-house means that we are able to experiment with materials and directly control quality prior to making larger production runs."

Nium has also seen the benefit of having its design and account staff interacting with the work in a hands-on manner that is rare for other creative agencies. "It connects our staff to the work. Everyone who touches it can see and feel it."

As for plans for the future, Nium plans to continue to grow its print offerings to meet the need of its clients.



**Figure 1.** Nium's in-house print studio is home to two digital presses, three large-format machines, and a wide array of finishing options.

The Magazine

16

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017



# American Spirit

Steadfast reliability. Uncompromising quality. Tireless innovation. The unmistakable virtues that make up the foundation of the American ethos can be found in every fiber of the remarkable products from Clearwater Paper. From Ancora's two-sided mastery to the unmatched packaging brilliance of Candesce CIS, Clearwater Paper products produce results as enduring and exceptional as the spirit they embody. A spirit found nowhere else in the world.

## Reflections

Ancora® | Candesce®



For samples, or to find a merchant distributor in your area, email us at [pandp@clearwaterpaper.com](mailto:pandp@clearwaterpaper.com)



Both Ancora and Candesce are available with either FSC or SFI CoC certification.



# Workflow & Operations Assessment

By Dillon Mooney, Technical Consultant, Printing Industries of America



Your company is turning a profit. You feel you have good personnel. You have made some capital investments in equipment/technology. Are you overlooking anything? What about your workflow?

Workflow is more than an organizational flow

chart documenting the various steps or procedures in your manufacturing process. Workflow includes all activities and the relationships of those activities necessary to produce a job or printed piece. Aside from the flow chart, many managers are not adept at evaluating their workflows as the procedures and tasks are ingrained in the company culture—"This is how we do it and it works." Using a set of independent eyes can identify improvement opportunities to make your processes more efficient and less prone to defects.

A workflow or operations assessment can be customized to the needs of a printing operation. It can examine the physical layout of the plant in regard to location of the different operations and how their proximity affects excessive employee motion and wasted time transporting work-in-process inventory. Progressive management philosophies incorporate concepts from Lean manufacturing in their workflow, seeking to continually reassess and look for improvements.

Evaluation of workflows can include the following:

## Human Resources

- Are skilled people being hired and retained?

## Customer Service

- Do communications with customers and outside designers include file preparation guidelines and quality and delivery expectations?

## Estimating

- Are production costs being tracked and documented?
- Are budgeted hourly rates for the equipment calculated for the actual equipment?
- Is the estimating software integrated into the MIS software?

## Scheduling

- Does the MIS software use an electronic job ticket that tracks the job in real time, and are changes easily identified by the operators?

## Prepress

- Is the equipment suitable and efficient for the workflow?
- Is color management being used and implemented correctly?

## Pressroom

- Does the equipment suit the type of work being produced? Does it include technology and automation that makes it cost competitive?
- Is the equipment, including accessories, working correctly?
- Is there a written maintenance program with records?

- Are there written SOPs that are easy to understand and are they implemented?
- Are environmental controls being used to maintain temperature and humidity?

### Makeready

- Are materials being staged for premakeready?
- Are tools and other materials the press operators use available in convenient, easily accessible locations?

### Bindery

- Is the equipment and technology suitable to achieve outputs for the requirements of the binding operations?
- Is there a preventive maintenance program?

### Warehouse

- Are rolls/pallets organized and easily accessible with a fork truck?
- How much raw material and product damage is visible?
- Is inventory tracked in the MIS software?

### Plant Layout

Plant layout is the physical relationship of the building, including size, location of departments, and the efficient flow or movement of a job through the production process. New equipment installations and plant expansion are opportune times to evaluate the plant layout. Improvements in plant layout can often free up significant amounts of space.

- Does the physical workflow make sense, resulting in the least distance of movement, and are frequently used materials stored near point of use?
- Is the right amount of space allocated for each piece of equipment, avoiding clutter and making it easy to move around and access equipment?

### Summary

Workflow assessments can optimize existing technology, equipment, space, and identify needs for immediate improvements and future investments to ensure maximum efficiency and profitability.

**Leading Solutions Provider  
for the Mailing Industry!**



Phone 800.728.0154 or visit  
[www.mcspro.com](http://www.mcspro.com) today!

### Industrial Inkjet Systems

- MCS 4.25" Eagle Inkjet
- MCS 2" Falcon Imager
- MCS 2.5" Osprey Inkjet



### Industrial Camera Systems

- MCS Perfect Match
- Output Camera Systems



### High-Speed Inserting

- FlowMaster
- MailStream Direct
- FTS



### Digital Presses

- MCS KM 1070 & 1100 - Color
- MCS KM 1250 & 2250 - B&W



# Is Your Operational Waste on the Rise?

By James A. Workman, Vice President, Center for Technology and Research, Printing Industries of America



As we begin 2017, the economy is in its eighth year of growth and printing companies are, on average, enjoying the highest level of profitability since the Great Recession. Growth, however, may have been accommodated with decisions counter-productive

to reducing waste and improving performance.

Floor space may have been haphazardly filled with inventory or additional equipment. Clutter and disorganization may have become the norm. Safety priorities may have been overlooked in order to stay on schedule.

Now would be a good time to reassess operational performance. Printers that pursue operational excellence do so in part by putting in place disciplined processes for employees to search for and remove non-value-added activities (things customers wouldn't want to pay for). That helps bring manufacturing costs down, develops an energizing culture, and reduces lead time.

Here are eight types of waste companies can use to assess the efficiency of their operations. All employees should be sensitized to these so they can be spotted and dealt with. If a company is ignorant of its current situation, things are unlikely to improve.

## Defects

This refers to more than the product itself, but the time and materials wasted in producing defective product then re-running it. Waste from product defects includes employee time spent, materials and

equipment used inspecting and sorting defective product, and in identifying, handling, and segregating non-conforming product.

## Overproduction

Overproduction is producing product earlier or in an amount greater than the next process or customer needs. The result is large amounts of product spending long periods of time in work-in-process (WIP). Symptoms of overproduction include pulling jobs off equipment in the middle of a production run to make room for another job, production overtime that customers don't pay for, large amounts of floor space clogged with skids of WIP, process bottlenecks and bindery extras that are never used, and warehouses filled with finished inventory.

## Waiting

Processes and people waiting for other processes and people to complete activities, scheduled downtime, equipment breakdowns, defective product, and inaccurate and incomplete job information are all non-value-added waste.

## Transportation

Think about the time spent and extra equipment used to valet information, tooling, materials, supplies, and WIP around the plant. Moving product on pallets from one side of the building to another and back again is a perfect example.

## Inventory and WIP

Inventory should be whittled down to the bare minimum. There is a dollar cost in time and resources to hold excessive raw materials, lots of WIP, and a warehouse full of finished goods. This is why "just in time" is a mantra at many Lean-thinking companies.

## Motion

This includes time wasted searching for and retrieving tooling and materials, getting around equipment and processes, and making numerous equipment adjustments. Other causes for excess motion are adjustments due to broken and poorly functioning tools, ineffective color management, abnormal equipment conditions, and lack of teamwork and process organization.

## Extra Processing

Companies sometimes spend extra time and effort to manipulate a product in a way that customers don't perceive as valuable. It might be in how jobs are packed or tight production tolerances. Extra processing also happens because of redundant actions and activities required due to poor job planning, fixing errors and mistakes, inadequate materials, and sudden mechanical problems from substandard press and equipment conditions.

## Non-Utilized People

Can we agree that it's a waste not to utilize people's abilities, input, creativity, and teamwork? This type of waste is caused by antiquated thinking, departmental silos, resistance to change, lack of timely feedback, poor hiring practices, and little or no investment in training and education.

## Summary

Despite production pressures in a growing market, printers must find ways to improve or find themselves at a competitive disadvantage. Creating an improvement culture isn't easy. It starts with honestly evaluating the extent to which time, materials, money, and brainpower are wasted, pinpointing the worst examples, and bringing employees together to problem solve and test new approaches.

*Looking for improvement ideas, inspiration, and know-how? Attend the 2017 Continuous Improvement Conference, April 2-5 in Pittsburgh, PA. The event, presented by PIA in partnership with SGIA, covers how printing companies can use the concepts of Lean manufacturing and other management and quality systems to out-perform the competition. Information at [ci.printing.org](http://ci.printing.org).*



# YOU

WANT AFFORDABLE SOLUTIONS THAT WILL GROW REVENUE.

# WE

HAVE DIGITAL SOLUTIONS TO ANALOG CHALLENGES.

bizhub® PRESS C71cf



With advanced color management, variable data capabilities, shortened lead times, all wrapped up in a minimal footprint, this is a digital label printer that doesn't sacrifice performance for affordability.

Want to experience more of what WE can do for YOU?

► [CountonKONICAMINOLTA.com](http://CountonKONICAMINOLTA.com)



KONICA MINOLTA

© 2016 KONICA MINOLTA BUSINESS SOLUTIONS U.S.A., INC. All rights reserved. Reproduction in whole or in part without written permission is prohibited. KONICA MINOLTA, the KONICA MINOLTA logo and bizhub are registered trademarks or trademarks of KONICA MINOLTA, INC. Design & specifications are subject to change without notice.

The Magazine

21

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017

# OSHA Update

## New Electronic Injury and Illness Data Reporting Rule

By Gary Jones, Assistant Vice President, EHS Affairs, Printing Industries of America



On May 11, 2016, the Occupational Safety and Health Administration (OSHA) released its new recordkeeping rule requiring employers to submit injury and illness data annually, beginning in July 2017. The rule, Improve Tracking of Workplace Injuries

and Illnesses, has two components. The first component requires companies to submit records of workplace injuries and illnesses electronically to OSHA. The second component prohibits retaliation against employees who report workplace injuries or illnesses.

This controversial rule resulted in legal challenges to its validity by industry groups. As a result, OSHA delayed implementation of the anti-retaliation provisions and issued additional guidance on several provisions in the rule, which can be found at <http://prnt.in/2016osharule>. Since the federal court in Texas did not enjoin the rule, it became effective on December 1, 2016. The two lawsuits are still active, and a court has not ruled on the merits of the rule.

### Electronic Submission Requirements

The rule requires certain employers, including printing operations, to electronically submit

the injury and illness information to OSHA. The requirement applies to the following:

- Establishments with 250 or more employees that are currently required to keep OSHA injury and illness records
- Establishments with 20-249 employees that are classified in certain industries with historically high rates of occupational injuries and illnesses

Data submission requirements for these businesses will be phased in according to **Chart 1**.

OSHA will remove personally identifiable information and then post the establishment-specific injury and illness data it collects on its website at [www.osha.gov](http://www.osha.gov).

### Informing Employees about Injury Reporting and Anti-Retaliation

While not in the rule itself, OSHA's preamble explanation of the rule states that an employer must provide reasonable procedures for reporting work-related injuries and illnesses that do not deter or discourage employees from reporting them.

According to OSHA, informing employees about their right to report injuries can be met by posting the OSHA *Job Safety and Health — It's The Law* poster

### New Electronic Form and Submission Requirements

Recordkeeping Forms for Year	Establishments* with 250+ Employees	Establishments* with 20-249 Employees	Deadline to Submit Form
2016	Form 300A	Form 300A	July 1, 2017
2017	Form 300 Log, Form 300A & Form 301	Form 300A	July 1, 2018
2018 and thereafter	Form 300 Log, Form 300A & Form 301	Form 300A	March 2, 2019

**Chart 1.** New electronic form and date submission requirements

\*Establishment means a single location and not a total company enrollment amount.

from [www.osha.gov/Publications/poster.html](http://www.osha.gov/Publications/poster.html) (provided it is a version from April 2015 or later). It is highly recommended that printing operations include a policy in their handbooks stating employees have a right to report any injury or illness without fear of retaliation and specifying the procedure for reporting work-related injuries and illnesses. The procedure must be reasonable and not deter or discourage employees from reporting.

OSHA gave examples of unacceptable programs and disciplinary policies that might deter employees from reporting injuries and illnesses. These include post-accident drug and alcohol testing, certain types of injury and illness reduction incentive programs, and indiscriminate discipline.

- **Post-Accident Drug and Alcohol Testing**

**Policies.** According to OSHA, such testing may deter employees from reporting an accident or injury due to the inconvenience, burden, or invasion of privacy resulting from the test. If, however, the employer has an “objectively reasonable basis” that drug/alcohol use by the reporting employee could have contributed to the injury or illness, post-accident drug and alcohol testing does not violate the rule. If more than one employee is involved in an accident, then all involved employees must be tested.

OSHA was clear it cannot prevent any post-incident drug testing that is consistent with the terms of a state’s Drug-Free Workplace or workers’ compensation statutes, or federal law (such as U.S. Department of Transportation regulations). In addition, testing is permissible under the rule even in the absence of such a state or federal law if an employer’s private insurance carrier offers discounted rates for having a post-incident drug testing policy. Random, pre-employment, and reasonable suspicion testing are not covered by the rule and are permissible.

- **Safety Incentive Programs.** Companies may not create employee reward programs for positive outcomes such as low injury or illness ratings or number of days without a lost-work-time incident. OSHA stated that these incentive programs

may deter injury and illness reporting and are not allowed under the rule. It is OSHA’s position, however, that a safety incentive program based on leading indicators, such as a program that incentivizes compliance with safety rules, completion of voluntary additional safety training, or participation in voluntary safety committees or meetings, would not deter the reporting of injuries.

- **Indiscriminate Discipline.** The new rule prohibits employers from taking adverse action against employees that report work-related injuries or illnesses, such as discharge, demotion, or denying a significant benefit (e.g., bonus). Also prohibited is assigning the employee “points” that could lead to future consequences, demeaning or embarrassing the employee, threatening to penalize or otherwise discipline an employee for reporting, or dismissing them for not following vague safety rules such as “Work Carefully.”

OSHA is very clear that the new rule allows employers to discipline employees for violating legitimate safety rules. In instances where an employee violated a safety rule and was also injured as a result of that violation, then reported the injury or illness, that employee could be disciplined without violating the rule. To conform to the rule, the company must have specific safety rules and demonstrate that these rules are enforced uniformly.

## Conclusion

Because the federal court did not issue an injunction or a final ruling, printing operations need to conform to the provisions of the new rule. Otherwise, nonconforming companies are at risk of OSHA citations.

Printing operations should also review their injury reporting procedures as recommended. The best practice is to require employees to sign a form showing that they have received and read the policy. In addition, supervisors and other management personnel should be trained on the disciplinary procedures to ensure that they are implemented uniformly.

# Sustainability Certification

## Does It Make a Difference in Print Manufacturing?

By George B. Glisan, Ph.D., Reese Distinguished Professor of Graphic Arts & Imaging Technology, Appalachian State University



Too often owners and managers of printing companies believe that as long as they offer sustainably sourced paper choices they will be regarded as “green.” The reality is that printing is manufacturing. Offering raw materials that are “green” doesn’t, by extension, make your production

process “green.” As a scientist would say, having sustainable inputs would be a *necessary*, but not *sufficient*, condition for being “green.”

To become a sustainably managed manufacturer of anything requires consideration of more than materials. Minimally, it requires that you lessen your environmental impact, streamline your production processes, focus on continuous improvement, and of course, you are profitable to sustain the enterprise. It is possible for a printing company that aspires to become “green” to achieve all of the foregoing; however, without a roadmap it will not be easy. Furthermore, assuming you achieve a sustainable production process, how do you validate the achievement to your clients, your employees, or the community where you live and work?

There is a validating solution that comes with a roadmap. That solution is the Sustainable Green Printing (SGP) Partnership. SGP is a third-party nonprofit entity focused on sustainability and printing.

Increasingly, our world is tilting ever closer to the need—even demand—that the world’s various commercial interests are serving the planet and its population with their best long-term interests in mind. The reason for this is summarized by one stark

### WHAT TO EXPECT

#### In 2017

As the impact of certification becomes more widely known, especially on financial performance, inquiries to SGP will be commonplace.

#### For the Next Few Years

The number of SGP certified printing companies will double.

#### For Five Years and Beyond

Our industry will evolve to a point where it will be common to have chain of custody paper certifications, AND sustainable print certification as well.

reality—we’re nearing a global population of 8 billion on a planet with finite resources. Climate change will play a role in the future, but sustainability is about finding a balance between consumption and preservation of resources for the survival of the planet and its population without resorting to conflict.

Recently, I conducted research on printing operations in North America that obtained SGP certification. The research found certified printers were more likely to reduce VOC and HAP emissions, reduce energy and water consumption, increase the volume of recycled materials, and reduce the volume of landfilled materials. In addition, certified companies were more likely to report reduced costs of operations and increased profitability.

Yet, less than 1% of all North American print manufacturing operations are SGP-certified. I attribute this low number to two factors. First, SGP is a relatively new organization. Second, these findings are not yet widely known, especially the finding that a certified company is more likely to increase profitability.

# BEYOND INNOVATION DISCOVER SOLUTIONS



## CANON SOLUTIONS AMERICA NAMED A LEADER IN WORLDWIDE HIGH-SPEED INKJET PRESS BY IDC MARKETScape FOR 2016<sup>1</sup>

The IDC MarketScape 2016 recognition encompasses Canon Solutions America Production Print Solutions' breadth of product offering—as well as innovative workflow software and service expertise—with end-to-end solutions ideal for specific industries including financial, insurance, retail, healthcare, higher education, non-profit, advertising, and publishing.

A trusted partner and recognized leader in the industry, Canon Solutions America's commitment to its customers has led to a digital production lineup unrivaled in the marketplace.

There's only one name you need to know in production printing—and beyond. We're one Canon. We're here for you. Download our *Portfolio of Innovative Print Solutions*: [PPS.CSA.CANON.COM/NEWOPPORTUNITIES](http://PPS.CSA.CANON.COM/NEWOPPORTUNITIES) 



PROFESSIONAL  
SERVICES

END-TO-END  
SOLUTIONS

INNOVATIVE  
WORKFLOW  
SOFTWARE

877-623-4969 [CSA.CANON.COM](http://CSA.CANON.COM)

**Canon**

CANON SOLUTIONS AMERICA



CANON SEE IMPOSSIBLE

# Industry 4.0

By Dr. Mark Bohan, Director, Prinect and CtP, Heidelberg, USA



Print manufacturing is embracing Industry 4.0 with the next level of industrial production driven by digitization, having gone through many changes over the past decades. This is driving productivity while ensuring and verifying the quality of the

printed materials in an autonomous and integrated manner. Industry 4.0 is the fourth industrial revolution, with the first revolution based on the harnessing of power from steam or water, followed by the advent of mass production using electric energy. This was followed by the use of digital technologies using electronics and IT to further automate the production process.

What we are seeing now with the fourth industrial revolution is the use of cyber-physical systems. These are effectively systems and processes which communicate with each other, machine and/or

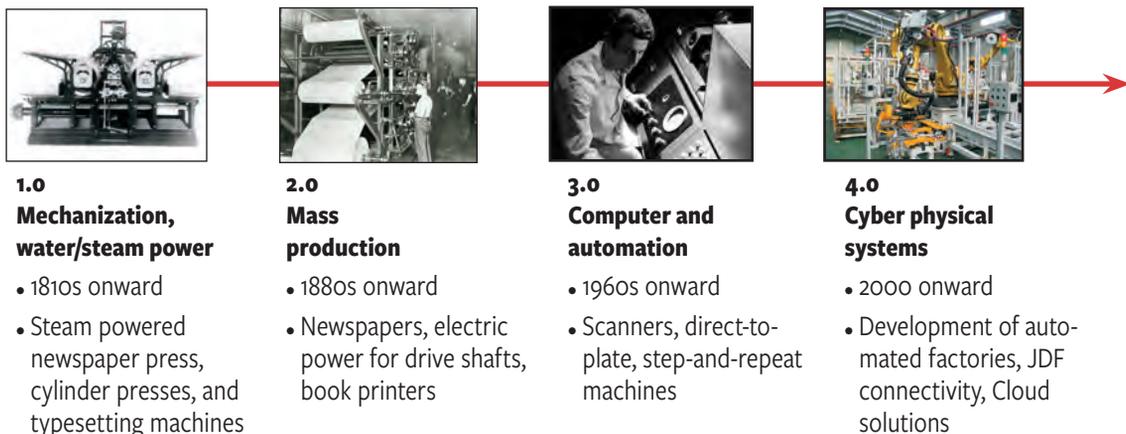
humans, both inside and outside company boundaries, collaborating to provide a smart production system throughout the whole value chain. Examples from the printing industry can be seen in **Figure 1**.

The nine key components that drive Industry 4.0 are as follows:

1. System integration
2. Big data and analytics
3. Simulation and virtualization
4. Industrial internet of things (IoT)
5. The Cloud
6. Cybersecurity
7. Autonomous robots
8. Augmented reality
9. Additive manufacturing

While not all of these may be evident in each case, the manufacturing will leverage many of these key components.

This will have a very significant change in both the way in which businesses operate and also those that will be successful in the future. While efficiencies



**Figure 1.** The evolution of Industry 4.0 in the print industry.

can be gained in each of the processes, it is only through a fully integrated manufacturing systems approach that fully uses the IoT, analytics, and digital data that the complete manufacturing value chain can be configured for optimal performance. This self-directing factory runs on shared data and it is always fully transparent. This makes it possible to optimize the workflow globally while continuing to drive productivity gains on a silo-by-silo basis. As new opportunities to break bottlenecks and accelerate throughput begin to emerge, the uplifting effect on profitability can be dramatic.

### Getting Started

Many of the component parts are now available, transforming the smart factories of tomorrow into the reality of today. Systems are available from manufacturers that leverage the Industry 4.0 approach and offer significant improvements to the manufacturing process, where strength is gained from having the complete approach across all manufacturing areas.

---

## WHAT TO EXPECT

### In 2017

The leveraging of technology to drive autonomous printing.

### For the Next Few Years

Adoption across the industry of technologies that underpin Industry 4.0 across the companies independent of their size.

### For Five Years and Beyond

Full adoption of Industry 4.0 principles with intelligent factories that print autonomously and dynamically price their product based on the load and capabilities.

The communications industry is one that is at the forefront of embracing this approach to its business operations. Exploiting these systems for business allows increased throughput and productivity to drive profitability. Companies that embrace this will see a significant competitive advantage in the marketplace today and in the coming years.



# 2017 INTERTECH™ TECHNOLOGY AWARDS

## Call for Entries

For 39 years, the InterTech™ awards have honored technologies predicted to have a major impact on the graphic communications industry. Will your work be honored this year?

Open to manufacturers and suppliers of equipment and software involved in any aspect of graphic communications operations. To be honored with an InterTech™ award, a technology must be recognized by the judging panel to meet the following criteria:

- Be truly innovative, not just an evolutionary improvement to an existing product
- Enabling printers to operate more efficiently or offer new products or services
- Commercially available, yet not in widespread use

For more information about the InterTech™ awards, visit [www.printing.org/intertech](http://www.printing.org/intertech)



Printing Industries of America  
CENTER FOR TECHNOLOGY AND RESEARCH

---

# Connecting the Market

## NFC Spurs Changes and Variations in Printed Media

By John Bodnar, Technology and Research Assistant, Printing Industries of America



As 2017 unfolds, near-field communication (NFC) is experiencing a great surge in awareness and popularity. Apple using NFC for its Apple-Pay phone and watch-based payments helped give consumers a simple introduction to this technology. Nintendo's

WiiU console made it possible for collectible figurines with NFC tags in the base to be used with the controller to affect gameplay and also built a collecting culture in the process. These two large brands threw their hats into the NFC ring and created new experiences and an increased level of interactivity with point-of-sale and entertainment. These are just two functions (payment and media manipulation) out of a variety options. What else can NFC do and to what limitations? More importantly, can it be implemented into a business plan and print marketing strategies?

One of the most common applications for NFC is a smart poster, which is a printed poster that has a defined location for a consumer to tap a phone to for an enhanced experience. This experience can be a video, music file, or website. The experience could also be an interaction with an app such as entering into a contest, access to exclusive video, or a free download. Smaller formats are possible. In Asian and a few European markets, downloads of full music albums are made possible via NFC-enabled cards that supply access to the desired material. This can even work to promote a music single or include a music video. Of course, the

---

*“NFC offers another means for connecting with customers at a new level, discovering new metrics on interactivity, and building stronger brand loyalty.”*

---

card would only be limited to what the desired function is.

In pharmaceuticals, food, and beverages, there are options for product assurance with packaging. NFC was tested with Johnny Walker Blue Label as a means to notify customers if the packaging has been compromised by having an NFC antennae that breaks when the seal of the bottle is broken. By tapping your phone to the designated point, you will be notified that the bottle has been opened due to the antennae breaking in the process. With higher priced wines, NFC is used to certify that your product is genuine and not counterfeit. Both of these functions can be utilized in the packaging process and in promoting brand confidence in customers. The ability of NFC to help authenticate pharmaceuticals is obviously important, as well.

As the level of connectivity to devices and new forms of product interaction continue to grow, there will be additional functions and advancements in those functions. Greater use of NFC can lead to lower costs for tags and programming hardware as well as advances in software solutions. Most important, this is another means for connecting with customers at a new level, discovering new metrics on interactivity, and building stronger brand loyalty.

# Ingredients for Better Variable-Data Printing

By Jon Hall, Senior Graphic Designer, Printing Industries of America



Variable-data printing (VDP) is not a new concept, but many printers and designers are still unsure about how to use it effectively. VDP has been transforming the digital printing industry by including variable text, image swapping, and even more advanced

uses like geomapping, personalized QR codes, and personalized URLs.

Regardless of new techniques or software made available for VDP, a successful campaign comes down to two main ingredients: good, reliable data and an effective message to your evolving audience.

## Good, Reliable Data

Collecting and maintaining good data is the most important aspect of a successful variable-data campaign. For basic VDP, information such as first and last name, company, title, address, and email is required. However, to use variable data effectively, it's wise to gather more information about your customer base. Depending on the nature of your business, delve deeper into your customers' demographic data. If you're not actively gathering your customers' purchasing trends, conducting a survey can gather additional information such as their purchase history, frequency, method of buying your product (phone, one-on-one sales, or online), and feedback about your products.

Once you have the information you need to create effective lists for your variable marketing, maintaining your lists becomes key. Keeping in contact with your customer base and referring back to your sales

force can help keep your lists current. Update your database weekly to monthly depending on how often you are in contact with your customers. It's a common mistake not to update a database, and navigating through bad data can be frustrating and time consuming.

## Micro Moments and VDP

In today's mobile-centric world, we have to move beyond just targeting the right audience. Not to belittle the idea of marketing to the right people, but let's move one step further and talk about how people interact with your business.

According to a 2016 survey from Google, over 40% of people ages 18–49 use only smartphones to search for answers and research reviews for a product or service immediately before a purchase. And over 60% use more than one device to perform searches before a purchase.

By using these “micro moments” where people are searching for answers, there is an opportunity for VDP to be effective. For example, a targeted direct mail and email using variable data can invite past customers to review a product or service online they recently purchased within the last six months in exchange for a specified discount toward their next purchase. Placing a variable image featuring the product they purchased and “recommended for you” products keeps your brand and their needs in mind.

Using variable data effectively can have a tremendous impact on how your customers interact with your company and brand. VDP can't work alone, but integrated into a cross-media campaign, it can be a very powerful tool.

The Magazine

29

PRINTING  
INDUSTRIES  
OF AMERICA

WINTER  
2017

# Enhancing Transmedia Storytelling

By Phil Snyder, MFA and Karen Snyder, MFA, University of Houston

TECHNOLOGY



Transmedia storytelling represents a process whereby integral elements of a story are dispersed systematically across multiple delivery channels/platforms for the purpose of creating a unified and coordinated entertainment/communication experience. Ideally, each medium makes its own unique contribution to the unfolding of the story, and there is heavy audience interplay within the story itself. Ultimately, however, the technologies used in the delivery of stories are what have allowed transmedia to become the storytelling juggernaut it is. Thus, it is primarily the emergence of mobile-based content delivery technologies that has driven this revolution in storytelling.

## The *Star Wars* Archetype

Among the most influential of transmedia offerings, and an archetypal example of the phenomenon, is the *Star Wars* franchise. Originally distributed as a feature film in 1977 viewable only in public theatres, fans can now watch more of the story in the TV shows, read more of the story in the books, play through additional stories in video games, and add their own thoughts to the story world through fan-based contributions. This audience-centered storytelling approach is what makes

## WHAT TO EXPECT

### In 2017

We will see continued expansion of transmedia merchandising technologies with variable-data printing personalizing applications.

### For the Next Few Years

We will see explosive growth of more localized 3D printing of toys, games, clothing, and other transmedia licensed merchandise.

### For Five Years and Beyond

In-home 3D printing of merchandise will be standard practice.

transmedia especially attractive and effective in how it empowers the consumer to give feedback to the producer—often themselves becoming producers of unlicensed spinoff content, creating tributes, spoofs, fan conventions with cosplay, and new stories based on the original.

Printing technologies play an increasingly important role in the story delivery as well, since everything from traditionally bound books,



The Magazine

30

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017

---

***“Everything from traditionally bound books, graphic novels and comic books, posters, and packaging to tickets and trading cards are all considered parts of the multiplatform storytelling process”***

---

graphic novels and comic books, posters, and packaging to tickets and trading cards are all considered parts of the multiplatform storytelling process.

Not to be overlooked are the huge and increasingly profitable licensing applications. The Walt Disney Company, which purchased Lucasfilm for \$4 billion in 2012, is the master of franchise merchandising. Little girls who do *not* own a toy based on the movie *Frozen* may be in the minority in America, thanks to Disney’s expertise in transmedia marketing.

George Lucas made the vast majority of his \$5 billion fortune not from the motion pictures themselves, but from merchandising, to which he very presciently retained the rights. *Star Wars* toys have generated over \$12 billion since 1977. In addition to the toys, there are the products that license the *Star Wars* brand, which in total revenues after 35 years have generated \$35 billion.

An observer might find many of the branding tie-ins surprising. A short list includes a Cover Girl makeup line, non-dairy coffee creamers, fresh fruit, macaroni & cheese dinners, bottled water, tea infusers, a Pringles snack line, ice cream, breakfast cereals, and even duct tape. All of these require print technology for packaging and labels.

*Star Wars* may have taken place in a galaxy far, far away, but the story hits home in many different ways—some unavoidable as fixtures in the cultural landscape—and transmedia delivery technologies are at the forefront. Every child who plays with a toy from the franchise, reenacting or reinventing parts of the story, participates in that cosmos in their own microcosmic way.

---

## COMPLEMENTARY CONTENT

**How One Brilliant Decision in 1973 Made George Lucas a Multi-Billionaire Today**

<http://prnt.in/lucasbillionaire>

**Disney Publishing Worldwide and Random House Announce Relaunch of Star Wars Adult Fiction Line**

<http://prnt.in/swfiction>

**Abstract: 3D Printing as Driver of Localized Manufacturing: Expected Benefits from Producer and Consumer Perspectives**

<http://prnt.in/3dmerch>



**You Are At Risk.....**

It is critical that you prepare for the expense of an (IP) Intellectual Property lawsuit.

- Patent and Patent Troll lawsuits are strategically used as a business tactic to leverage market position.
- Patent and other IP lawsuits can *easily* cost millions!

**TALK TO US ABOUT A SPECIAL PIA MEMBER BENEFIT:**

**GET A TROLL POLICY WITH \$250K OF PROTECTION FOR \$3000 OR LESS!**

[www.ipisc.com](http://www.ipisc.com)  
800.537.7863

**IPISC's Insurance Products Offer Solutions**

- Combating litigation.
- Paying legal costs if your ideas are stolen or you are sued for Infringement.
- Offering confidence that you can't simply be spent out of business with a frivolous lawsuit.
- Supporting your claims to the fullest extent of the policy.
- Minimizing your risk of unattractive licensing deals.

**Put the Global Leader On Your Side!**

IPISC provides clients peace of mind by protecting their businesses against crippling patent and troll litigation.

# M3 Is for Controlling Metallics

By Martin Habekost, Associate Chair of the School of Graphic Communications Management, Ryerson University



In 2009, ISO 13655 was released to update the way color is measured in the print industry. This ISO procedure lists four measurement conditions labelled M0, M1, M2, and M3. M0 is for all legacy models that do not meet ISO 13655. M1 is measuring printed sheets with

a defined amount of UV light added to the white light, so the optical brighteners in the paper can be excited and included in the measurements. The light source used for these measurements has also been updated.

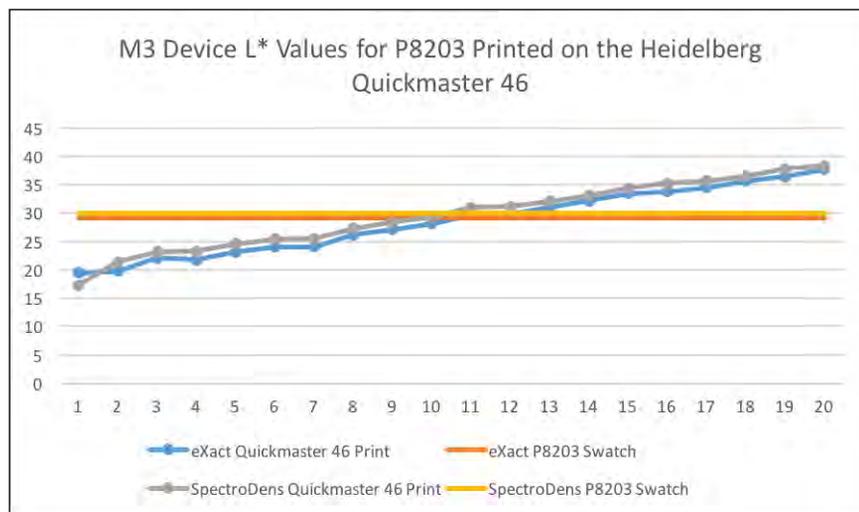
M2 is the same as M1, but without the extra UV-light excitement. That leaves M3. This measurement condition has been created for special-effect inks, as it says in the standard. The light used for the measurement is the same as in M2, but two polarization filters have been added. One is in front of the light source and the second in front of the measurement sensor. The orientation of the grating of these filters is orthogonal to each other. This ensures that no strong specular reflection from the sample influences the color measurement.

In 2015, a study was conducted with a set of 10 metallic offset inks. First, prints were made on the Prüfbau printability tester and then also on an offset press. For the color measurement two M3 capable instruments were used; one was an

X-Rite eXact and the second was a Techkon SpectroDens. Both instruments measured very similar  $L^*a^*b^*$  numbers and also gave quite similar ink density values. The prints were made on coated paper.

In the current study, the test was expanded into metallic flexographic printing inks. The flexographic and offset printed samples were not only printed on coated paper, but also on a board, like those boards used in the manufacturing of folding cartons. A gloss water-based coating was applied to the printed samples to see if that had any influence on the measured color and density values. The same instruments used in the 2015 study were also used in this study.

The results from the current study show that the application of water-based coating has very little effect on the measured color; therefore, the printed ink density can be used for controlling the ink on press. Since the measurements on the folding carton board were not influenced by the board or the water-based coating, the M3 measurement mode



## FORECAST FOR 2017

Print companies printing metallic inks for their customers will start to use the M3 measurement mode to control metallic inks on press. Print companies need to invest into instruments that support the M3 mode.

can be used for controlling metallic inks in this application.

The flexographic printing inks have a larger metallic flake than the offset inks, but the measurement instruments were not influenced by this. This is due to the two polarization filters that are used in the M3 measurement mode. Also the application of water-based coating has a negligible effect on the measured  $L^*a^*b^*$  and corresponding density values.

The message to all print shops that print metallic inks is that they should get a color measurement device for press-side use that is capable of the M3 measurement mode making the guesswork of printing metallic inks a thing of the past.

## Financial Performance Assessment: The PIA Roadmap to Financial Success

Find out where your company's fiscal strengths and weaknesses lie and get a customized plan for success.

Also includes 3 months of on-going assistance from PIA's industry economic experts.

Visit [www.printing.org/fpa](http://www.printing.org/fpa) to learn more and to schedule your consultation.



## Meet the Landa Digital Printing team in Long Beach, CA on March 12-15, 2017

Landa Digital Printing is proud to be participating in the up-coming Printing Industries of America, **President's Conference**

- Learn more about what Landa presented during Drupa 2016
- Gain a better understanding about the Nanographic® Printing process
- Collect some new, hot-off-the-press, Landa samples

For more information, or to register to meet with Landa during the conference, go to:  
[www.landanano.com/PIA](http://www.landanano.com/PIA)



President's Conference:  
March 12-15, 2017 in Long Beach, CA

Landa

The Magazine

33

PRINTING  
INDUSTRIES  
OF AMERICA  
WINTER  
2017

# Measuring OBAs

By Christopher Smyth, Assistant Professor, Ryerson University; and Gerry Gerlach, Color Management Expert & Member of Idealliance Print Properties Committee



Optical brightening agents (OBAs) are chemical additives used in the production of cosmetics, fabrics, laundry detergents, papers, and more. They make things appear “whiter and brighter”. Used in paper coatings, they provide an economical and efficient way to help make stock more attractive to both print buyers and end users.

OBAs work by absorbing light energy in the ultraviolet (UV) parts of the electromagnetic spectrum (approximately 340–370 nm) and re-emitting this light energy in the “bluer” region of the spectrum (420–470 nm). This is what lets “yellowish” products appear whiter. On their own, the yellowish colored products reflect less blue light; the brighteners supply this light, and the printing appears whiter to our eyes.

## Background

The challenge is that conventional color management workflows did not necessarily take into account the UV portion of the spectrum. Different lamps and measuring devices had varying levels of support for UV and effectively “ignored” it.

Several groups focused on printing and publishing responded to this challenge by updating standards and specifications.

## ISO: ISO 3664:2009 and ISO 13655:2009

Published in 2009, in effect internationally in 2012, ISO 3664:2009 “Graphic technology and photography (viewing conditions)” was designed to support viewing conditions that *included* the UV portion of the industry standard D50 viewing condition. Previously, ISO-compliant lamps were not required to have a specified amount of UV light. As a result, higher-OBA sheets would not appear consistent in the viewing booth as the OBAs were not emitting the same level of light as outside of the booth.

Another change in 2009, ISO 13655:2009 “Graphic technology – spectral measurement and colorimetric computation for graphic arts images” was introduced to include additional measurement approaches in part to help accurately measure and predict the impact of UV light. New measurement classifications included the ability to use legacy unfiltered measurements (M0) and new “D50 full spectrum measurements” (M1).

Together, these changes offered better alignment between the viewing light and the instrument measuring light. However, the higher OBA content in some press sheets meant that the proof to press did not match—either visually or numerically. Press sheets would look blue (or the proofs look too yellow), due to the addition of UV light and the resulting blue re-emitted by the OBAs.

## GRACoL 2013/CRPC-6

G7 GRACoL® 2013 (CGATS 21-2, CRPC-6) is a newer print characterization data set that was developed

Proof			Press Sheet			Acceptability %s 1a (unacceptable) to 4d (acceptable)			
L	a	b	L	a	b	1a	2b	3c	4d
94.04	0.79	-2.82	94.86	3.22	-9.24	100			
94.04	0.79	-2.82	94.08	1.29	-3.54	57			28
93.87	1.15	-4.91	94.86	3.22	-9.24	14	14	28	43
93.87	1.15	-4.91	94.08	1.29	-3.54		28	43	28
94.93	3.41	-9.52	94.86	3.22	-9.24	14	43	14	28
94.93	3.41	-9.52	94.08	1.29	-3.54	14	28	28	28
94.10	1.29	-3.67	94.86	3.22	-9.24			28	70
94.10	1.29	-3.67	94.08	1.29	-3.54			26	43

**Figure 1.** Sample results from a survey of Idealliance ‘G7’ training attendees in Toronto, Canada. The results of this version of the survey indicate the most acceptable proof-to-press matches (4d, green column) are with a moderate OBA stock, made with CRPC6 with a higher OBA content press sheet. The least acceptable match (red column, 1a) was with a lower OBA proofing stock made using older GRACoL 2006 data, when compared to a higher OBA press sheet.

with a slightly “bluer” whitepoint, (95, 1, -4) in an effort to find a better “match” with current papers.

### Current Proof-to-Press Assessments

Our continuing research will focus on two parts. The first seeks to verify the applicability of GRACoL2013 (which is built using CRPC-6) as an M1 reference data set for current commercial printing on a range of OBA stocks available in the North American market.

The second is to check on the visual acceptability of proof-to-press matches for combinations of low-, moderate-, and higher-OBA media (proofs and press sheet samples) derived using M1 measurements. This involves capturing the opinions of a variety of observers as to the acceptability of a particular proof-to-press match under ISO 3664:2009-compliant and controlled viewing conditions.

In addition, other surveys were completed using different participants and combinations of proofing stocks and press sheets.

The resulting data and analysis could help establish best practices for working with OBA-influenced stocks in the printing value chain (buyers, clients, preproduction, printers, etc.). As well, it could support the theory that the North American printing industry could benefit from a new, additional, characterization set, specifically developed for higher-OBA workflows.

Learn more about OBAs and this research at the Technical Association of the Graphic Arts Tech Conference in Houston from March 19 to 22. Or keep an eye out for the 2017 TAGA Proceedings—including all conference presentations—which will be released later this year.

**HIRE RIGHT  
THE  
FIRST  
TIME**

**Caliper partners with PIA to provide exclusive member benefits including;**

- 10% discount on hiring assessments
- 10% discount on staff development tools
- In depth experience working with printing industry professionals

**CALIPER** To find out more, visit [calipercorp.com/pia](http://calipercorp.com/pia)

---

# Forecast for eLearning

By Sam Shea, Digital Content Manager, Printing Industries of America



Recently some of the biggest players in the tech industry have invested in online learning, or eLearning. This investment, in turn, will no doubt continue to drive technological development in this space. Three areas one can expect major development in

eLearning include video-based training, mobile learning, and increased personalization.

To better understand the scope of eLearning, let's examine just a handful of the recent developments within the industry. Software giant Adobe, which already had the eLearning content creation software Captivate, recently released Captivate Prime, which added delivery and administrative functionality. In another example of the industry's growth, two of the most well-known entities in the learning management software (LMS) segment, the for-profit company Blackboard and the open-source platform Moodle, announced an expansion of their already established partnership. Finally, perhaps the most significant news in eLearning involves LinkedIn acquiring the popular online video training website Lynda.com in the spring of 2015 for \$1.5 billion followed by Microsoft purchasing LinkedIn for \$26 billion at the end of 2016.

## Video

One significant trend in eLearning involves the incorporation of video, and this practice will only continue to grow. While informal online video-based learning has been taking place for as long as there have been online videos, the goal of

formal eLearning approaches is to incorporate video-based content in structured frameworks.

## Mobile Learning

Another significant trend in online learning involves compatibility with mobile devices. Mobile learning, or mLearning, has been a buzzword for a number of years. A study by RnRMarketResearch.com predicts that this segment of the online learning market should grow to \$37.60 billion by 2020 with a compound annual growth rate (CAGR) of 36.3%. A related trend you can expect to see here is eLearning that takes advantage of mobile-enabled virtual reality (VR) systems.

## Personalization

A final burgeoning practice in eLearning involves the incorporation of "Big Data" to provide increased personalization. Just as Netflix builds your queue of recommended movies based on your past viewing history, eLearning systems are taking advantage of user feedback and data to provide more tailored experiences. The acquisition of Lynda.com by LinkedIn points to such an instance where existing user data could be harnessed to provide relevant suggestions for online learning.

## What to Expect

Using recent history as an indicator, it seems likely that major companies will continue to invest in eLearning technologies, either with an eye toward becoming solution providers or for their own corporate training needs. It also seems likely that, moving forward, a stereotypical eLearning situation will involve a learner engaging through a mobile device with some form of video-based content that has either been recommended (or mandated) for them based on their personal data.

# 2017 CONTINUOUS IMPROVEMENT CONFERENCE

April 2-5, 2017 | Pittsburgh, PA



Presented by



## BRINGING AN IMPROVEMENT CULTURE TO LIFE

The **2017 Continuous Improvement Conference** is the only printing industry event focused on helping companies achieve operational excellence by using the concepts of Lean manufacturing and other management and quality systems. Year

after year attendees directly link reduced costs, lowered waste, and increased profit margins to ideas gained from conference presentations and networking.

### 2017 Continuous Improvement Conference Featured Keynotes:



Engaging Everyone Everyday:  
Lean Management at Work  
**Joe Murli**  
*The Murli Group*



Everybody Matters:  
Unlocking Unlimited  
Potential  
**Rich Diviney**  
*Barry-Wehmiller*



Why Isn't Lean Working?  
Investing in People to  
Navigate the Lean Road Trip  
**Jamie Parker**  
*FedEx Office*



How to Do a Gemba Walk  
**Michael Bremer**  
*Cumberland Group*



Fix What Bugs You:  
Making Problem Solving  
Your Competitive Edge  
**Greg Glebe**  
*Xylem Design*

Register now at [ci.printing.org](http://ci.printing.org).

20/20

Do you have a clear **VISION** of your future?



## 2017 President's Conference | March 12-15, Long Beach CA

Be a part of the conversation as we explore strategies for developing both short- and long-term plans for improving your bottom line and growing your business.

We have an exceptional lineup of leadership, finance, operations, and human resources experts ready to discuss the important issues facing our industry today such as:

- Managing disruptive change
- Navigating US labor policy changes
- Growing market share
- Running a modern family business
- Beating the patent trolls
- Controlling healthcare costs

*I'm attending because I believe that leaving this conference with just one great idea can help our organization excel!* – **Doug Rawson**, President, Superior Litho

Bring along your leadership team and **save \$200 off each registration!**

Register at [www.presidentsconference.com](http://www.presidentsconference.com)