

For Affiliates of the Printing Industry Center at RIT

Printing as an Industry, Commodity, and Activity

By the late 20th century, books, magazines, newspapers and the occasional special print order made by individual consumers constituted only a fraction of the output of the U.S. printing industry. Whenever we read the label on a can of soup, review a bill, sign a check, or send a package via FedEx or UPS, we are handling a product of the printing industry. Therefore, tracking the growth of the industry is a tricky proposition. A research publication of the RIT Printing Industry Center, entitled *Printing as an Industry, Commodity, and Activity: An Economic Analysis of Growth and Inter-Industry Transactions*, by Maryellen R. Kelley and Nicolas Rockler, describes printing activity in the U.S., and defines the industry, the major printing commodities, types of customers, and the relationship between printing and the activities of other industries.

Defining the U.S. Printing Industry

The problem of industry definition is the result, in part, of the legacy of the industrial classification system. The North American Industry Classification System (NAICS) was adopted by the U.S. Economic Census in 1997, replacing the Standard Industrial Classification (SIC) system that had been in use since 1939. This change had a profound impact on how researchers track the changes in the size and structure of the printing industry. Under the SIC system, printing and publishing were grouped into one code, but now they are two separate codes. In addition, the NAICS system created new classifications that track print

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Color in Package Printing



In 2005, RIT completed a three-year project for ExxonMobil Corporation to develop an engineered approach to achieving repeatable and predictable color for the package printing industry. The strategy for achieving color faster, better, and cheaper is to rely on science instead of crafts. One of the key ingredients is the use of color measurement tools for press-side color control instead of visual based color adjustment that is subjective, dependent on viewing conditions, and difficult to document.

Based on this research, the RIT Printing Industry Center hosted its first public event, *Package Printing: An Engineered Approach to Repeatable and Predictable Color*, on November 14, 2006. This event brought nearly 100 participants to learn about the new methodologies developed by RIT. A number of case studies described how RIT extended the methodologies from press laboratories to commercial settings with success. 📷



Image 1. Bob Chung

RIT Professor Bob Chung explains the era of digital color management and how it is tied to the repeatable color methodology.

Image 2. Robert J. Eller

Robert J. Eller, ExxonMobil Chemical Company, delivers the keynote presentation on repeatable color becoming the future of package printing.

Slideshows and other session details from this event can be found at http://print.rit.edu/events/symp06_pkg/index.php

2006 Symposium & Planning Meeting

The annual meeting of the Printing Industry Center was held November 15-16, 2006. Nearly 80 participants—representatives from Industry Partner companies and their guests, RIT faculty and administrators, and RIT graduate students—came together to learn about the research that was conducted over the past year.

Research topics in 2006 included: Emerging Global Print Markets, Printing Industry Offshoring, Creativity in the Printing Industry, The Case for Print Media Advertising in the Internet Age, Print Media Distribution, Permanence of Toner on Paper, Faithful Facsimile Reproduction, and Digital Print Quality.

On the second day of the event, RIT researchers presented their proposed research plans for the coming year, and Industry Partner companies had the opportunity to provide feedback. This collaboration in developing the research agenda results in rich and relevant inquiries into the printing industry.

Based on these discussions, a Center plan of work for 2007 will be released to the community in January. Descriptions of the research and the principal investigators involved will be posted on the Center web site. 📄

More on Center research is available at <http://print.rit.edu/research/>



Image 3. Frank Cost

Frank Cost, Co-director of the RIT Printing Industry Center, sets the stage for the event presentations on research conducted in 2006.



Image 4. Patricia Sorce and Michael Pletka

Patricia Sorce, Co-director of the RIT Printing Industry Center, connects with an Industry Partner representative from Xerox at the event reception.

Color Printing Outreach, A New Training Initiative



RIT has developed three new industry education programs to enable the printing industry to optimize, standardize, and control their print production workflows. Ultimately, the industry as a whole can achieve a more agile process that better serves their client's needs.

Is color an important strategy to your company's competitiveness? Is making color repeatable and predictable a very important task that is required in your job? If you responded yes to either of those questions, consider the following programs.

Program Overview

Each of the three seminars offered on the RIT campus are structured in sequence and are designed with different learning outcomes in mind.

← Color Printing Fundamentals, the Seminar for Beginners

This basic-level seminar assumes no prior knowledge of color and color measurement. The program is designed to bring awareness to those who are new to the graphic arts industry or are in need of basic working knowledge and skills regarding color as applied to color specifications and assessment of printed color reproduction.

← Color Printing Process Control, the Seminar for Pressroom and Quality Assurance Personnel

This intermediate-level seminar introduces an engineered approach

to achieving consistent color printing in both conventional (i.e., offset, flexo, gravure) and digital printing environments. Participants should have a basic understanding of color perception and color measurement as applied to the graphic arts industry before taking this program.

← Predictable Color Proofing and Printing, the Seminar for Color Savvy Professionals

This seminar focuses on various techniques in achieving color agreement between different workflows and printing devices—design-to-print, proof-to-press, and press-to-press. Designed as an advanced-level short course, participants should have working knowledge of color measurement and process control as applied to print production before enrolling.

The state-of-the-art color measurement and color management laboratory and the digital press lab will be used for these hands-on workshops. The lab is equipped with digital presses from Kodak and HP. Excel templates will be used to learn key concepts during the seminar. Participants will be able to adopt the seminar tools to enable printing processes that more repeatable in their own work environment. 📺

Further information on these programs and registration information is available at <http://www.seminars.cias.rit.edu/>

Case Studies on Environmental Strategies

In response to changing pressures from customers, environmental groups, local communities and government regulators, many printing companies have realized that they need to integrate ecological principles into their comprehensive strategies. This month's research monograph is entitled *Formulation and Implementation of Environmental Strategies: A Comparison between U.S. and German Printing Firms* by Diana Mross and Sandra Rothenberg, Ph.D. (No. PICRM-2005-07). It takes a "case study" approach by examining the environmental strategies and outcomes of four printing companies, two American and two German.

Using public ratings and the opinions of industry experts, several companies known for proactive environmental management practices were identified for this study, of which four were ultimately selected for diversity in size and location:

- Oktoberdruck AG: a small German company with 26 employees,
- Zeitungsdruckerei Leipziger (ZDL): a large German printer with 250 employees,
- Alonzo Printing: a small firm in California with 54 employees, and
- Hickory Printing Group: a large American company with 259 employees.

Each of these companies has taken what printing experts and/or environmental professionals consider a leadership

position with regard to environmental management in the printing industry. All four succeeded in creating a competitive edge, ranging from reducing costs to improving stakeholder relations to capturing and retaining customers. Yet the environmental strategies of the four companies differed depending on the competitive forces that each faced.

Hickory Printing Group

This large privately-held commercial lithographic printing firm was established in 1917 by Mr. and Mrs. William Reese, and today the current chairman of the board of its two North Carolina plants is their son, Tom Reese. In 2004 Hickory, with a total sales volume of \$40.8 million, was ranked 123rd in the Printing Impressions 400.

Tom Reese started becoming actively involved in pollution control and the promotion of public awareness of environmental conservation in the early 1950s, and served as president of the North Carolina Wildlife Federation and in other high-profile positions. Hickory Printing is environmentally conscious because Reese sees that as the correct way to do business, regardless of the financial outcome.

Over the years the company has salvaged its waste paper, recovered silver (until shifting to CTP technology in 2000), eliminated isopropyl alcohol in fountain solutions, and experimented

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Table 1. Case Selection

	United States	German
Small Firm	Alonzo Printing	Oktoberdruck
Large Firm	Hickory Printing	Leipziger Zeitung-druckerei (ZDL)



Environmental *continued*

with soy-based inks. Reese insists that the firm continuously reduce its use of chemicals and invest in technology solutions, such as a centralized purchasing system and automatic blanket washers. Its latest initiative is a community waste management program, in which Hickory collects and recycles its customers' waste paper in return for credits on their next printing orders. This has increased its customer base. Hickory has been recognized locally and nationally for its commitment to the conservation of natural resources.

Zeitungsdruckerei Leipzig (ZDL)

ZDL was established in 1992 as a large state-of-the-art plant in Leipzig/Stahmeln, Germany, specializing in web offset newspaper printing. The firm is owned by two equal partners, the media enterprises Madsack Hannover and Axel Springer AG in Berlin, who established environmental guidelines for ZDL to follow. Customers have also influenced its environmental actions.

ZDL's goal for 2005 to 2007 is to reinvest in four new web offset presses that will reduce the use of solvents and lower VOC emissions through the installation of automatic rubber blanket washing units. Because

ZDL's management believes that its environmental management is synonymous with performing well, it has decided not to get certified for international quality and environmental standards (ISO 9001 and ISO 14001), but rather to continue with its informal environmental management program.

Dirk Müller, who is responsible for ZDL's environmental practices, compiles an ecological balance report every year, evaluating all material and energy flows in the facility, and compares it to specified goals. Once a year ZDL meets with other German newspaper printers to compare ecological operations ratios, and also works closely with environmental protection organizations and consulting firms. Other ZDL initiatives are related to process improvements, ranging from reducing packaging and energy consumption to recycling solvents and used inks. Today ZDL uses 96% recycled newsprint and soy-based inks.

Since ZDL began to show its commitment to environmentally-sound newspaper production, relationships with stakeholders have improved. ZDL communicates to its readers how the newspaper is produced, reporting both positive environmental experiences and the problems that the firm encounters.

Oktoberdruck

This small company was founded in 1973 in Berlin, as a self-administered collective printing firm with five employees, specializing in multi-color sheetfed offset printing. Today all of the current 26 employees own proportional shares of the company and collectively determine within democratic structures how the firm operates. The firm's annual sales are DM 5.5 million (\$3.4 million in U.S. dollars).

Oktoberdruck considers environmental commitment to be its natural responsibility. The company's

1985–1986 participation in an environmental study conducted by students at the Technical University of Applied Sciences in Berlin resulted in its first major investment in implementing work safety procedures, such as installing an exhaust air unit, ventilation system, and noise protection wall. By 1999 the proportion of recycled paper it used had reached 38%, and today both vendors and manufacturers are involved in ecologically-oriented troubleshooting. Oktoberdruck was the first printing firm in the Berlin area to implement an environmental management system (EMS) and be validated by the EU Eco-Management Audit Scheme (EMAS). As current president Martina Fuchs-Bruschbeck points out, “In recent years, environmental issues have begun to be perceived as political issues.”

Alonzo Printing Corporation

Alonzo is a Hayward, California (San Francisco Bay area) union shop founded in 1976 that specializes in sheetfed and web offset printing and generates about \$9 million in annual sales. In the late 1980s, Alonzo’s founder Jim Duffy adopted an environmentally-friendly strategy for the company, but the economic recession of the late 1990s forced him to rethink these priorities because environmentalism had taken a back seat in the mind of his price-conscious customers. Recently, Alonzo’s new marketing and communications firm, Traversant, is again helping the company to promote its former environmentally-friendly image.

Alonzo was the first printer in Alameda, California to be certified as a “Green Business.” Its main environmental initiatives are the standardized use of recycled paper and soy-based inks. It was the first company to use Kenaf paper, a non-wood paper alternative, and it also recycles water, paper, office waste,

and solvents. The company exceeds all regulatory compliance standards and conducts internal “eco-audits” in order to compute its water, electricity, gas, paper, ink and solvent usage.

Since Alonzo once again began pursuing an environmentally-friendly strategy, the firm has established a good relationship with its union and retained many of its customers. Traversant believes that the marketing message of Alonzo’s environmental stance as a value-added service will differentiate the company from its competitors, attracting new customers.

Different Approaches

While all succeeded in creating a competitive edge from environmental initiatives, the strategies of the four companies differed depending on the competitive forces that each faced.

Both of the smaller firms are deliberate in their approach to developing their environmental strategies, using environmentally sound products to capture and maintain a niche market. On the other hand, the large firms have a more emergent feel to their environmental strategy, and primarily focus on the continuous introduction of technological solutions and process improvements.

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Environmental continued

As can be seen in Table 2, each company took a different approach to the use of environmentally “friendly” inks and paper. While Alonzo Printing uses 100% post-consumer paper as their house stock, Oktoberdruck and ZDL increasingly offer recycled paper as a house stock, and Hickory prints on recycled paper if that is requested by the customer and the customer is willing to pay the additional cost.

Conclusion

The case study results indicate a transition in the printing industry from initiating environmental actions ad-hoc to formulating and implementing environmental strategies. Yet, there is still potential for deliberate environmental strategies in printing firms. Before a company can formulate and implement a strategy, management

should analyze all factors facing the firm and influencing the managers’ perception of environmental issues. These factors include: factory conditions, the context for strategy and rivalry, demand conditions, and related and supporting industries.

Once these are analyzed, the environmental strategy needs to be supported by strong leadership. The case studies made clear that the leaders of these firms had a tremendous influence on creating cultures in which environmental issues were important. Without strong leadership, a proactive environmental strategy is not possible in the face of constant pressure to resort to more traditional means of achieving strategic success.

To read about this research in detail, download the monograph from: <http://print.rit.edu/pubs/picrm200507.pdf>

Table 2. Comparison of Ink and Paper Choices

	Oktoberdruck	ZDL	Alonzo	Hickory
Papers	Increased use of paper with recycled content	Majority of paper is recycled paper	100% post-consumer paper as house stock	No recycled paper unless requested
Inks	Vehicles in inks are 80% vegetable oil	Uses soy-based ink	Always uses soy- based ink	No vegetable oil ink

Printing continued

specializations brought about by new technology (such as digital printing) and that isolate smaller specializations that had formerly been lumped into a broader category. Using the 1997 Census definition of the printing industry, the authors reconstructed a time series of annual

revenues for the years 1977 to 2002, and adjusted the data for inflation, benchmarking the series to 1997 prices. The data analysis includes a comparison of the major specializations within printing, namely, printed books, business forms, and commercial printing—the one specialization that

is not identified with a specific type of document.

Trends in Industry Growth

Overall, annual revenues for the printing industry increased from \$50.3 billion in 1977 to \$99.6 billion in 2000. During that time period, the 1980s saw the greatest growth. Between 1981 and 1990, the industry grew at the rate of 5.2% per year and industry shipments increased by \$32.4 billion (in 1997 dollars). Commercial printing was the fastest growing branch of the industry, responsible for 83.9% of its growth during these years. Of the four other contributors to printing industry revenues (business forms, books, prepress services, and bindery/postpress operations), business forms was the largest, with over 20% of the printing industry's annual revenues and growing at 2.4% per year.

Between 1991 and 2000, the revenues of the printing industry as a whole grew by only 1.7% per year. A decline in business forms revenues began in 1988, after having achieved a peak of \$15.6 billion in revenues for 1987. By 2002, the business forms segment was generating only \$8.5 billion in revenues, which was \$2.1 billion less than the real value of the industry's shipments in 1977 (\$10.6 billion).

This contrasts with the new NAICS classifications of quick printing, digital, screen, and flexography. They were responsible for 21.7% of the commercial printing industry's revenues, and this share increased to 25.5% by 2002.

Changes in Industries' Use of the Commercial Print Commodity

The greatest increase in commercial print sales during the 25-year period studied was driven by the growth in demand from the service industries. Four industry groups—technical/professional business support & related

administrative services; wholesale & retail trade; civic/business associations, professional & similar membership organizations; and publishing—increased their purchases by more than \$4 billion. Moreover, 25% of the overall growth in commercial print sales was attributable to the first of these groups: technical/professional business support & related administrative services. Purchases made by industries in this group increased by over 400% between 1972 and 1982, and by 150% between 1982 and 1997.

On the opposite end of the spectrum, three industry groups—paper, plastic & metal packaging; processed foods & related products; and finance, insurance & real estate—so reduced their use of commercial print that their 1997 purchases were smaller than the amounts purchased in 1972! The next section may explain why this happened.

Printing Activity Elsewhere—Secondary Production of the Commercial Print Commodity

Some industries other than the printing industry generate their own printed output. Since it is impossible to measure the printing output of such secondary producers directly (because they are not classified as belonging to the printing

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Printing *continued*

industry), the authors used a “proxy” measure to estimate the commercial print commodity output produced by other industries.

The proxy measure they used was printing ink. The estimated amount of commercial print commodity output generated by an industry (outside the printing industry) was computed by multiplying that industry’s purchases of printing ink by the reciprocal of the ink I-O coefficient. The results showed the amount of secondary commercial print production to be substantial, adding another \$21.3 billion, \$19.5 billion, \$30.5 billion, and \$42.5 billion to printing output in 1972, 1982, 1987, and 1997, respectively.

Comparing the actual amounts of primary commercial print output reported in the I-O accounts, the overall amount of secondary output that was being produced (and not counted) in other industries exceeded primary output by 17.1% in 1972. This situation did not last, however. Secondary output was 26.3% less than the primary commercial print commodity output in 1982. Secondary print production increased again in 1987, and by 1997, other industries were estimated to be generating only 8.3% less print than

the actual (primary) commercial print commodity output of \$46.3 billion.

The publishing and packaging industries were shown to be responsible for producing most of the secondary commercial print output in each of the benchmark years. Together, secondary print production by these two industry groups accounted for 84.1%, 82.6%, 84.1% and 75.8% of all secondary output estimated to have been produced in 1972, 1982, 1987, and 1997, respectively.

The newspaper industry is perhaps the only unambiguous case of a decline in print use by an industry. In 1997, the combination of secondary production and purchases of the commercial print commodity by the newspaper industry totaled \$3.9 billion—less than the \$4.3 billion the newspaper industry required in 1982.

Final Observation

Since a substantial amount of print production takes place in industries in which the printing methods have become integrated into other processes that would not otherwise be identified as printing, the locus of printing activity and the conditions under which it may be expected to flourish are uncertain and difficult to predict. 📖

To read about this research in detail, information on the publication can be found at <http://print.rit.edu/kelley/>

Workforce Education & Training

Feb 6–8
Color Management for Flexography

Feb 21–23
Basic Flexographer - Level 1 (New)

Feb 26–March 2
Orientation to the Graphic Arts &
Digital Imaging Workshop

March 6–8
Color Printing Fundamentals (New)

March 7–9
Lithographic Relationships and
Variables

March 14–15
IT Requirements for Successful
Digital Printing (New)

March 20–22
G7™: A New Method of Calibrating
Proof to Press (New)

March 21–23
Digital Printing Bootcamp

March 27–29
Flexographic Relationships and
Variables (New)

April 3–4
Implementing Variable Data Printing
(New)

April 3–5
Print Buying Essentials

April 11–13
Web Offset Lithography

April 18–20
Lithographic Troubleshooting

April 24–26
Color Printing Process Control (New)

RIT has been a leading provider of education for the printing and imaging industries for over 50 years. Education and training is provided in both traditional and digital technologies using world-renowned instructors, RIT’s comprehensive prepress and press labs, and the latest imaging facilities. While seminars are scheduled throughout the year, customized programs can be designed to suit a company’s specific needs at any time, and are offered either at RIT or on-site.

FEBRUARY

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at krptpd@rit.edu



<http://www.rit.edu/printmedia>



About the Center

Rochester Institute of Technology (RIT) was selected by the Alfred P. Sloan Foundation in 2001 to join the family of Sloan Industry Centers located at prestigious universities across the U.S. The Printing Industry Center at RIT is a joint program of the School of Print Media and RIT's College of Business, emphasizing Sloan's long-standing tradition of applying a broad multidisciplinary approach to industry investigations and findings.

Dedicated to the study of major business environment influences in the printing industry brought on by new technologies and societal changes, the Printing Industry Center at RIT addresses the concerns of the printing industry through educational outreach, research initiatives, and print evaluation services. The Center creates a forum for printing companies and associations worldwide to access a neutral platform for the dissemination of knowledge that can be trusted by the industry, to share ideas, and to build the partnerships needed to sustain growth and profitability in a rapidly changing market.

With the support of RIT, the Alfred P. Sloan Foundation, and our Industry Partners, it is our mission to continue to develop and articulate the knowledge necessary for the long-term economic health of the printing industry.

More information on the Printing Industry Center at RIT and its research activities can be found online at <http://print.rit.edu>.

Industry Partners

Support for the Printing Industry Center at RIT comes from:



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