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:

Adobe · Baldwin · Creo · RR Donnelley · GPO U.S. Government Printing Office · Heidelberg · hp invent · IBM · MeadWestvaco · NexPress A Kodak Company · NPES · Standard Register · Vertis · VIGC · Weyerhaeuser · The Document Company Xerox

about the PrintReview

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Patricia Sorce, Co-Director,
Printing Industry Center at RIT

Frank Cost, Co-Director,
Printing Industry Center at RIT

Adrienne McHargue,
Communications Coordinator,
Printing Industry Center at RIT

Patricia Cost, Contributing Editor

Photography by Marten Czamanske

http://print.rit.edu

R·I·T Printing Industry Center
An Alfred P. Sloan Foundation Center

Rochester Institute of Technology
55 Lomb Memorial Drive
Rochester, NY 14623

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Selling Small
continued

The motivation to use less product is usually primarily economic. But, as Xerox found, proactive and environmentally aware customers also recognize the environmental benefits of reducing material use. Suppliers can educate their customers about the synergies between environmental performance and cost reduction. Framing services as a means to help both the environmental and financial bottom line makes an attractive proposition for customers.

As pressures for reduced material consumption become more salient, it is likely that this new model will become more common. The question for most manufacturers of products is not if they should move to selling small, but when. As in other areas of service provision, early movers will have the advantage.

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R·I·T Printing Industry Center

print review

[for Affiliates of the Printing Industry Center at RIT] Volume 2: Spring 2005

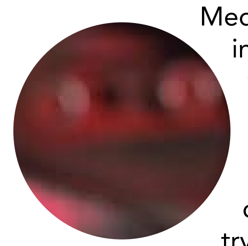
this quarter in:

news

Sloan Foundation Renews Partnership with RIT's Printing Industry Center

The Alfred P. Sloan Foundation has renewed its partnership with Rochester Institute of Technology's Printing Industry Center, awarding the center $250,000 over the next three years.

The Printing Industry Center—a joint operation involving RIT's School of Print Media in the College of Imaging Arts and Sciences, and the College of Business—is a forum for printing companies and associations worldwide, addressing concerns in the printing industry through research initiatives and educational outreach. The center generates a pipeline of data and observations that flows between researcher and industry representatives.

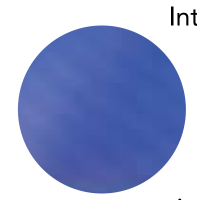


Industry partners pledge money to help fund the center's operations and advise RIT's researchers on topics critical to the printing industry. The industry partners are Adobe Systems Incorporated, Baldwin Technology Company, Inc., Creo Inc., RR Donnelley, Heidelberg, Hewlett-Packard Company, IBM Printing Systems, MeadWestvaco Corp., NexPress Solutions, Inc., NPES, Standard Register, VIGC, Weyerhaeuser and Xerox Corp. Two new partners will be joining the Center this spring.

RIT's Printing Industry Center will engage in a number of new research initiatives over the next three years including sourcing of print, insourcing versus outsourcing print services, and offshore outsourcing of printing.

"The unifying theme for all these activities is to develop a deeper and more refined understanding of the form and dynamics of new business models and processes that are emerging as a result of the rapid advancement of digital technologies and the global spread of ubiquitous high-speed access to the Internet," says Pat Sorce, co-director of the Printing Industry Center and chair of RIT's School of Print Media.

"The support of the Sloan Foundation and our industry partners has enabled RIT researchers to study the critical trends in the evolution of print as a complement and competitor to the Internet and then to disseminate what we learn to the industry in the form of published monographs, Web casts, electronic newsletters and numerous appearances at industry conferences and meetings," says Frank Cost, associate dean of the College of Imaging Arts and Sciences and co-director of the Printing Industry Center. "In the coming year, the center will begin to co-publish a series of books with the RIT Cary Graphic Arts Press. I have just completed work on the first book in the series, The New Medium of Print: Material Communication in the Internet Age, which comes out in June."



The Sloan Industry Centers program began in 1990. RIT launched its center in 2001, joining a list of other prestigious universities hosting Sloan Industry Centers, including Massachusetts Institute of Technology and the University of Minnesota.

RIT press release posted on May 10, 2005, at http://www.rit.edu/%7E930www/News/viewstory.php3?id=1555.

Successful Business Models for Digital Printing

Four different business models related to successful digital color print services are examined in the recent RIT Printing Industry Center report, *Digital Printing Success Models: Validation Study (2004)* (PICRM-2004-06). The four models, originally identified in a 2003 Center report (*Investing in Digital Color…the Bottom Line*), reflect different levels of investment in equipment, infrastructure, and human resources. Since the 2003 exploratory study was limited in scope, a more in-depth study was designed to provide more reliable estimates of the investments for each model, and to add business performance measures.

The 2004 study confirms the four typical business models we had found for success in variable data printing (from the lowest level of investment to the highest):

- Level 1: Quick Print Model
- Level 2: Commercial Short-Run Model
- Level 3: Internet On-Demand Model
- Level 4: Full Service/Fully Customized Model.

General Statistics on Respondents

On average, the sample of firms responding to the survey had been in business for 35.5 years. Almost one-third of the firms had under $3 million in revenues, and another third had over $10 million in revenues. Just over half of their overall digital printing was monochrome, and a somewhat lower percentage (44.8%) of variable data printing was monochrome. Most of our respondents bought their first variable data presses between 1998 and 2002. Table 1 shows the costs for all of the investments in getting started with variable data printing (using a 5% trimmed mean calculation).

Retaining customers and building loyalty were the goals of 53% of the variable data jobs, and seeking new customers typified

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Table 1. Investment Costs for Implementing Variable Data Printing

Investment	5% Trimmed Mean	Median
Initial press investment	$282,516	$250,000
Initial software investment	$17,370	$2,000
Additional hardware investment	$11,429	$5,000
Total additional software investment	$14,429	$0
Total network/ telecom/Internet investment	$6,484	$0
Database investment	$1,820	$0
Other investment	$716	$0
Total infrastructure investment	$416,250*	$358,500

*Total infrastructure investment is not the total of the figures in the column due to the 5% trimmed mean calculation.

this quarter in:

research

Trends in Fulfillment Services

As printers come to grips with the market effects of overcapacity, consolidation, shorter runs, and squeezed margins, many are surprised to discover that a technology revolution has been quietly building strength in the most unlikely corner of the print shop: the bindery. Here we examine the research presented in the Printing Industry Center at RIT monograph *Industry Trends in Fulfillment, Finishing and Distribution* (PICRM-2004-03).

Since growth trends in the overall economy no longer coincide with printing industry growth, printers can no longer hope for a rise in profits as the economy prospers.

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Selling Small and Smart

As society faces environmental limits to material consumption, the typical business model's goal of "selling large" must be questioned. In the seminal book *Small is Beautiful*, Schumaker argues that in order to be a truly sustainable society, we must ultimately consume less. The Printing Industry Center at RIT research report, *Selling Small and Smart: The Future of the Sustainable Enterprise* (PICRM-2004-01), outlines the experiences of three suppliers that are operating under a new business model that allows economic growth, while also helping society to step away from the spiral of increasing consumption.

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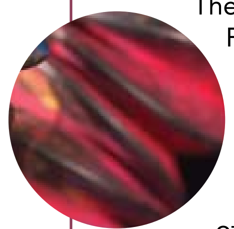
Selling Small
continued

In this new business model, material goods are not seen as ends in themselves. The traditional model of selling as much as possible is abandoned in exchange for a model in which firms make money by helping their customers achieve their goals while using less product.

Three Cases



The experiences of three companies, PPG (one of Chrysler's paint suppliers), Gage Chemical, and Xerox show how the switch to a sustainable business model can be successful. (See Table 3.) In addition to the reduction of product use, other environmental benefits were seen in all three cases.

Bringing About a Cultural Shift

The move to selling small is not easy. This new business model challenges one of the most basic assumptions about the goal of the average manufacturing organization, namely, that selling more of a product is good for the organization, and selling less of a product is bad. Internally, this basic assumption about the very nature of the firm is likely to be challenged, requiring attention to cultural change. Firms need to reframe the usual operating assumption from "the goal of our firm is to sell more product," to "the goal of our firm is to help our customers do X, and use less of our product in the process."

A Xerox spokesman explained the conflict: "It is a tough [transition] because you are now selling an intangible alongside the tangible, and the intangible (the services and optimization) is often the more important component of the transaction. … [But] when you ultimately concentrate on what is right for the client, the client is inherently going to give you more business and more revenue, which is an offset to the declining product element of a transaction."

Bringing about a cultural shift in employees' minds is not the only challenge to firms that are trying to "sell small and smart." They need to change sales incentive structures and the skill base within their organization. Also, at the operational level of the customer organization, reductions in the use of various materials are likely to mean changing long-held routines and assumptions.

How to Make the Switch

Given these challenges, how can firms manage the change to selling small? Drawing from the experiences of PPG, Gage, and Xerox, there are some general steps that can be followed for firms wanting to make the shift to selling small:

- **Build off Existing Strengths:** Often, suppliers are in the best position to help their customers use less of their product. Recognize and build off existing technical expertise about the product and the customer operation in which it is used, as well as the existing customer relation skills. In the experience of Gage Chemical and PPG, for example, there was already a service mindset that was used to help employees understand the new role they were playing for their customers. Xerox, on the other hand, built off an existing base of technical expertise, which contributed to the detailed process information needed to help customers find ways to use less product.

- **Redefine the Basis for Profit in Contractual Agreements:** Traditional contracts, usually based on compensation per unit sold, rarely offer any incentive for suppliers to help consumers use less of their product. New contracts need to offer "win-win" alternatives, in which both parties can benefit from reduced sales of the traditional product. These contracts can even include explicit goals for product use reduction and associated environmental goals. Gage, for example, changed the way it sold its material from a per gallon basis to a "cost per unit" basis, where the customer paid a set amount per vehicle being painted. Using a slightly different approach, PPG and Chrysler reformulated their traditional contract so that both parties shared cost reductions achieved by supplier initiatives

- **Communicate the New Business Model:** Selling small does not fit in the traditional business model, challenges basic assumptions, and requires change on both the part of the supplier and customer. Leaders need to continuously communicate, to all affected parties involved, the value in reduced product use and sales.

- **Change Incentives:** Most firms working under the selling large model offer incentives tied to increased product sales. These incentive systems need to be changed to allow salespeople and other employees to make the link between selling less and their own personal compensation. Gage, for example, eliminated commission. Xerox has stopped paying some employees on a transaction-by-transaction basis. Instead, they are paid on an overall year-over-year revenue increase from their customer base or their targeted geography.

- **Acquire New Employee Skills and Knowledge:** While suppliers need to build off their existing skills and knowledge, it is likely that these are not sufficient to fully implement the new business model. Additional customer service skills or technical knowledge about customer processes may be needed. For some companies, acquiring the appropriate skills may only involve retraining workers. All three firms we interviewed adjusted their service training to meet the needs of their new service role. For others, it may involve hiring workers with specialized knowledge about customer processes or even acquiring another firm. Xerox, for example, purchased an entire company in order to obtain an expertise in information technology.

- **Highlight Environmental Advantages:** Most approaches to selling small are motivated by customer interest in reducing cost. Yet, the environmental benefits are real and sometimes significant. Some suppliers will be approached by customers already interested in reducing environmental impact. For those that aren't, the environmental benefits of reduced product use can be a strong component of the marketing effort.

Firms are more likely to be successful selling small if there is pressure for change, coming either from the customers, as in the case of PPG and Gage, or from the market, as in the case of Xerox. Building a close relationship in which customers come to depend on the supplier for their process knowledge is the key to a sustainable selling small strategy. Thus, firms that want to sell small need to have an in-depth knowledge of the customer's processes and needs, and a close service relationship with the customer. Suppliers can also use the selling small approach to build closer relationships with their customers, and actually increase revenue in the process. In addition, because they are better able to propose innovative process solutions, firms with a broader product base and strong R&D department will benefit more from selling small than those suppliers who only produce one particular product.

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Table 3. Summary of Three Cases

	Gage	PPC	Xerox
Old Model of "Selling Large"	Selling chemical blends for automotive paint application	Selling paint for automotive paint application	Selling printers, copiers, and supporting products
New "Selling Small" Model	Providing an effective paint shop operation	Managing efficient and quality paint shop operations	Managing efficient document management processes
Material Good Reduced	Solvents and cleaners	Paint	Printers, copiers, paper, and toner
Other Environmental Benefits	Lower VOC emissions	Lower VOC emissions	Less energy use and reduced solid waste

Fulfillment Services
continued

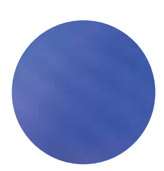
Print services providers are incorporating different strategies into their business models to respond to this new reality. Many are offering value-added services and the convenience of one-stop-shopping to grow their businesses. Finishing and distribution have become key value-added services that many printing companies are bringing in-house.

A Changing Industry

The sample for the industry survey in this research study consisted of databases from Finishing Resources, Inc., and the Binding Industries of America. Analysis of the survey data points to changing business dynamics in the printing industry.

The authors confirm a shift in the printing industry away from the traditional commercial printing company model and toward organizations that offer conventional printing along with a range of non-printing services. Eighty-three percent of the respondents indicated that in order for printing companies to remain competitive they would have to diversify by offering value-added services. Printing companies have to see themselves as "one with their clients," providing solutions rather than products.

Approximately 42% of the survey respondents characterize their business type as "full service provider." For the purposes of this research, a full service provider is defined as a company that provides a complete range of production services that begins with prepress and continues through to distribution.



Current Trends in Finishing

While the postpress area may not have seen the same radical technological change that has taken place in prepress departments over the past 10 to 15 years, there have been significant improvements in finishing and distribution, due primarily to digital and computer applications. Digital printing sparked a wave of in-line finishing developments such as in-line saddle-stitching, perfect binding, and three-side trimming options. New systems support variable sheet-count and variable information jobs with full integrity, because the sheets never leave the system.

Binding, folding, gluing, and stitching were the primary finishing services that the respondents' companies offer. Such standard finishing services are generally not outsourced, whereas specialty finishing services such as die-cutting, embossing, and foiling are frequently still outsourced.

While current industry research suggests that fulfillment is the number one value-added service being offered, our survey found that e-commerce was the number one service being offered (71%), followed by fulfillment.

Fulfillment Trends

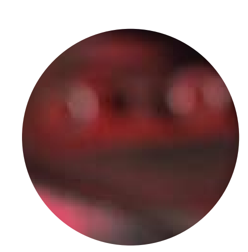
Fulfillment appears to be one of the primary value-added services offered by printers and finishers. Based on input from the pilot survey, fulfillment was defined as "the ordering, sorting, managing, assembly and dispersion of product through activities such as kitting, providing personalized customer packages of a product, or multiple products." Fifty-eight percent of all respondents offer some type of fulfillment service. Product fulfillment was reported at a slightly higher percentage than Internet fulfillment, kitting, literature fulfillment, or 'other.'

The NAPL Survey of Fulfillment Practices (2004) reports that for approximately 72% of overall respondents to its research survey, print volume has increased from clients receiving fulfillment services. Additionally, 75% overall and at least 65% in every company-size category reported that client profitability has improved as a result of offering fulfillment services.

Offering mailing, warehousing, and distribution has become distinctively advantageous for printers. Erik Cagle of Printing Impressions magazine believes that mailing capabilities today may seem like a value-added bonus, but two years from now those companies that have not committed to this discipline will find themselves in an unenviable minority. According to the Arandell Corporation, located in Wisconsin, adding mailing services has increased the volume of new jobs, because customers have embraced a one-stop-shopping mentality.

Future Trends

If we take a step back from the current research, a new question arises: How will the electronic distribution of information and print-on-demand impact traditional print distribution? The traditional print-and-distribute workflow is being replaced by one that reverses these steps; in such a model a file is electronically distributed and then the job is physically printed near the point of final delivery. It appears that customers will select a distribute-and-print option more frequently in the future.



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Digtial Printing
continued

39% of them. Nearly half of the firms we surveyed target specific vertical industries in selling variable data print services. The key challenge to selling variable data printing is the need to communicate the value of personalization to their customers. They also noted other challenges such as clients not having a retention or customer relationship strategy (83% said this), and clients having poor data quality (81%).

Cluster Analysis

Our cluster analysis of digital print providers was based on the degree to which their variable data revenues were from versioning, mail merge, personalization, transaction printing, Internet on-demand, and fully customized applications. The four-cluster solution verified the findings of our 2003 study, described in Table 2.

All four of the models identified had a substantial 12-month increase in revenue. We can conclude that there are many ways of achieving business success using digital printing technology, depending on the size of the business and its traditional strengths with the current client base.

- **Level 1: Quick Print Model**

With the lowest amount of revenue from variable data printing (8%), these firms also had the lowest investment of the four clusters. A majority of firms in the quick-print category also own offset equipment—the quick print nomenclature is somewhat misleading. The quick print name refers only to their digital applications.

- **Level 2: Commercial Short-Run Model**

While resembling the quick print model in terms of number of employees and ratio of IT employees to production employees, this group had more revenue from variable data printing jobs (19%), due primarily to the major printing application of versioning (reported by 100% of the respondents in this cluster). Based on the long-term history of the commercial short-run firms, there was likely to be significant infrastructure already in place for finishing, fulfillment, and distribution. This reduced the need for additional infrastructure investments, so that the primary capital equipment investment for this level was associated with the cost of the digital press equipment (87% of the original investment).

The next two clusters—Internet On-Demand (IOD, Level 3)and Full Service/Fully Customized (FS/FC, Level 4)—had a number of similarities. Both had a large proportion of IT employees and a large proportion of revenues coming from variable data printing; and both had a high percent growth in revenues. However, they differed in their approaches to providing personalized communications.

- **Level 3: Internet On-Demand Model**

The IOD model uses a "push" strategy, which means that a higher percentage of jobs are designed to seek customers. For example, a web-based template allows the local sales channel partner to leverage its knowledge about market characteristics. The end user can add localized information (data) to an existing web-based template to create customized marketing materials in small runs and on-demand. The technology ensures that brand integrity and corporate messaging are not compromised.

- **Level 4: Full Service/Fully Customized Model**

The FS/FC printer has built a software infrastructure that is based on a "pull" model that is initiated with the customer's inquiry to the web site or call center. Using variable text, pictures, graphics, and barcodes, a dynamic document is created in which the entire layout varies with the preferences captured from previous interaction(s) with the customer. Software rules customize the content. For example, if the recipient is female and over 30 years of age, insert paragraph 1 and graphic 3; if the recipient is male and less than 45 years of age, insert paragraph 12 and image 5. The result is a document designed for the individual recipient. These FS/FC printers have invested in a high-speed digital color print technology as well as the infrastructure to provide electronic distribution.

Both IOD and FS/FC printers can perform digital document supply chain management. The service provider creates value by helping clients increase the efficiency of their supply chain and deliver printed materials more cost-effectively, thereby reducing inventory and loss to obsolescence.

Table 2. Cluster Analysis Summary

Major Applications	Cluster 1 (n=26)	Cluster 2 (n=67)	Cluster 3 (n=46)	Cluster 4 (n=31)
Versioning	4%	66%	0%	100%
Mail merge	19%	85%	59%	48%
Personalized	46%	82%	43%	32%
Transaction	11%	10%	4%	6%
Internet on-demand	65%	41%	0%	0%
Fully customized	42%	51%	4%	3%
Descriptive Characteristics	**Cluster 1 (n=26)**	**Cluster 2 (n=67)**	**Cluster 3 (n=46)**	**Cluster 4 (n=31)**
Employee size (5% of trimmed mean)	70	118	51	51
Percent growth in revenues	13.2%	16.3%	11.8%	9.1%
Percent revenue from variable data printing	23%	31%	8%	19%
Percent of IT employees to production employees	16%	25%	7%	5%
Capital Equipment Investments (5% trimmed mean)	**Cluster 1 (n=26)**	**Cluster 2 (n=67)**	**Cluster 3 (n=46)**	**Cluster 4 (n=31)**
Total	$520,735	$908,833	$202,097	$309,805
Initial press investment	$349,402	$419,370	$171,075	$269,498
Percent of press investment to total investment	69%	46%	85%	87%

Only 8% of the digital printers in our study reported that transaction printing was a major part of their digital printing applications, and another 38% said it was a minor part. Perhaps because much transaction printing occurs in-house, our sample of independent printers did not include more transaction printers.

As more printers see a way for digital printing to fit into their existing businesses, we anticipate that the demand for digital printing equipment and supplies will continue to increase in the next few years.

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