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THE INSIGHT REPORT

digital printing directions

Trends & Opportunities
Prof. Frank Romano



Digital Printing Directions

Trends & Opportunities

Rochester Institute of Technology School of Print Media

This report was commissioned by Canon Europe for the benefit of the European printing industry and others involved in print. Canon Europe had no role in the research or results in any manner. The research team thanks them for their vision and support.

Research by graduate students enrolled in the RIT online Masters' Degree in Print Media Trends course: Heba Abokamil, Amanda Barber, Marianne Engum, Meredith Needham, Meara O'Connell, Gregory Pake, Charissa Shirk, Sandra Yveborg, Jiayi Zhou, under the direction of Professor Emeritus Frank Romano

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Introduction

1 | Introduction

1.1 Introduction

Digital printing has changed the graphic arts industry and will continue to change it. Both page/document and wide format digital printing have caused an upheaval in the workforce, skillsets, technologies, and marketing of print-based communication. Just as letterpress printing services once had to re-invent themselves when offset lithography entered the industry, printers have had to adapt to new printing technology, workflows, print products, and value added services.

1.2 Methodology

From January to March 2008, Professor Frank Romano and a team of RIT graduate students performed 619 interviews with print producers, industry observers, and others, in order to produce a snapshot of the digital printing industry today, with projections into its future. Projections are based trend analysis and computer models. The survey audience was representative of the global printing industry and in-depth interviews were used in place of interactive questionnaires to acquire more detail.

TABLE 1 - Interview population

	North America	Western Europe	Asia	Rest of World	Total	
Commercial and quick printers	39	63	27	22	151	24.39%
Pre-press services	11	21	8	5	45	7.27%
Other trade services (bindery, mailing)	9	12	5	3	29	4.68%
Publishers (book, magazine, newspaper)	4	9	1	1	15	2.42%
Copy shops	12	21	15	9	57	9.21%
Print buyers	22	44	11	11	88	14.22%
Media, consultants, associations	19	29	19	14	81	13.09%
In-plant and transaction printers	21	23	12	9	65	10.50%
All other (photo labs, suppliers, educators)	23	28	19	18	88	14.22%
Total	160	250	117	92	619	100.00%
	25.85%	40.39%	18.90%	14.86%	100%	

- North America: Canada, USA, Mexico (NAFTA)
- Western Europe: UK, Belgium, Netherlands, France, Germany, Spain, Italy, Switzerland, Scandinavia
- Asia: China, Japan, S. Korea, Taiwan, Vietnam, Thailand, Singapore, Malaysia
- ROW: Eastern Europe, Russia, Middle East, Australia/New Zealand, Africa, Central & South America

The survey population represented a meaningful cross-section of the printing industry on a worldwide basis. There is an emphasis on the European market because of the presentation of this report at drupa 2008, but the data and findings are valid across almost all markets.

Key findings

- 1 Print volumes are down in industrialised nations, but up in other nations, based on labour rates.
- 2 Print costs are rising faster than prices charged for print products and services.
- 3 Competition for printing is global, especially books, package printing, and non-time-sensitive materials.
- 4 The number of commercial printing establishments is trending down, mostly through consolidations.
- 5 A new breed of copy shop with digital printing is evolving – fostering the re-birth of the small printer.
- 6 Print buyers are consolidating and centralising their print purchases via the Internet.
- 7 Digital printing is making significant inroads at the expense of offset and screen printing volumes. Variable Data Printing in all its forms is gaining traction.
- 8 New value added services and increased efficiency to control costs are important trends in the maintenance of profitability levels.
- 9 A skillset gap is now evident to print providers, who seek legacy skills as well as new employee skills in database, programming, and marketing. Investment in training is at the lowest point since 1992.
- 10 The transaction and direct mail markets are converging, and cross channel marketing is growing. The modern printer is becoming a digital marketer.
- 11 Offset printers with digital printing are exhibiting higher profits than those without it.



THE INSIGHT REPORT

the digital crossroads

2

The Digital Crossroads

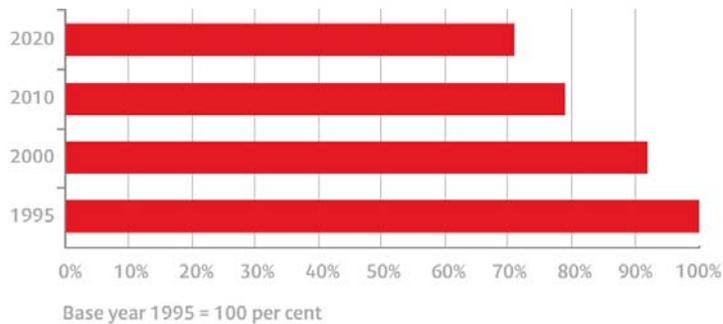
2 | The Digital Crossroads

The global printing industry is at a crossroads. One can compare it to the 1960s when letterpress printing was challenged by offset lithography. The offset process required new workflows and skillsets, but it engendered a whole new generation of print providers, and ushered in the concept of the quick printer. Digital printing in 2008 is at the point where offset was in 1968.

2.1 Changes in print volumes

Print volumes have both changed and shifted. The Internet and the use of other digital media have been responsible for the loss of about 20 per cent of all printing volume that existed in 1995, worldwide.

TABLE 2 – Internet effect on print volumes, 2000 – 2020



The worldwide volume of print is stabilising as we approach 2020. Most of the print volumes that can be substituted electronically will have been substituted.

However, another 20 per cent of all volume is now subject to global competition, especially books, certain packaging, and other non-time-sensitive materials. Thus, some printers in some Western countries have lost almost 40 per cent of their print volume (20 per cent from electronic substitution and 20 per cent from offshore printing) in less than five years. This has led to a reduction in the number of printing and related industry firms and created severe competitive pressures for those who remain.

TABLE 3 – Print production volumes by region

	North America	Western Europe	Asia	Rest of World	Total
North America (NAFTA)	73.10%	1.30%	12.10%	13.50%	100.00%
Western Europe	2.10%	71.10%	11.20%	15.60%	100.00%
Asia	0.00%	0.00%	97.30%	2.70%	100.00%
Rest of World	1.00%	8.30%	6.40%	84.30%	100.00%
Average	19.05%	20.18%	31.75%	29.03%	100.00%

For example, Western Europe produces 71.1 per cent of its print volume, with 11.2 per cent imported from Asia, and 15.6 per cent from the Rest of the World (mostly Eastern Europe). Import/export data is often misleading. For instance, it shows the UK as a primary exporter of printing to North America. This is true, except that the books shipped were printed in India, shipped to the UK and then trans-shipped to the US.

2.2 Global trade

The flow of shipping containers from Asia to Europe grew in 2007 by seven per cent. Containers have eliminated theft, loss, and are capable of handling perishable food, thus making foodstuffs globally available. Most of those containers contain products manufactured in Asia that are packed in boxes (printed) with labels (printed) and folding cartons (printed) and even instructions (printed). Customs officials count the products, but not the printing. Thus, we can only estimate how much printing has been lost by European and North American printers – and printers in other countries – because the base of manufacturing continues to shift from country to country.

Each nation attempts to develop a balance of trade and supports local industries that export. Today, China, India, and other Asian countries are the powerhouses of world trade, engendered by their lower wage rates. Japan was in such a position after WWII but their standard of living rose and they embraced quality. Then it was South Korea and the same thing happened. Today it is China and nations in the Pacific Rim with the low wage rates. But their standards of living will also rise and we may then run out of places in the world with low wages. Ironically, China is sub-contracting some work to Vietnam because their wage rates are lower than China's.

Some printed products are incorporating electronic technology and this has created a strange set of global relationships. The American Government Printing Office has contracted with two European companies to produce computer chips with a wire antenna, but they are assembled at a plant in Thailand. The blank passports travel to Europe where a microchip is inserted in the back cover and then returned to Thailand where they are fitted with a radio antenna. There were no US companies that could produce the “biometric” parts of the e-passport that met standards. GPO contracted with Gemalto and Infineon who produce the chip in the e-passport and who then subcontract with another vendor to do the inlaying. In the current production process, e-passport materials are moved via a secure transportation means, including armoured vehicles. Europe is in the forefront of Radio Frequency Identification (RFID) technology.

In North America and Western Europe, paper is about one third of the cost of a printing job. In Asia, it is fifty per cent, which indicates how low labour is as a percentage of manufacturing. Asia now has the advantage of low wage rates – and no significant base of legacy equipment and can thus compete with old technology used by Western printing firms on two levels – automation and labour.

The loss of printing volume has affected many geographic sectors: New Zealand has lost volume to Australia; Australia has lost volume to Malaysia; Singapore has lost volume to China, as have Europe and North America. For the first time the history of print, we are forced to justify and promote print to marketing and media buyers.

“By choosing a European printing company, print buyers are demonstrating that they are aware of the need to protect the environment and they can be certain that the working conditions in those companies are just and fair, an important principle for our society,” states the introduction in the brochure “Why work with the European Printing Industry?” created by Intergraf in cooperation with its members.

The brochure aims at informing print buyers and the general public about the characteristics of different production processes in printing and the constraints under which printers operate. It gives a comprehensive overview of the processes in the print chain, from raw materials to print finishing and recycling, including print processes such as offset, gravure printing and digital printing.

The current framework of regulations together with voluntary initiatives at national and European level ensures printed products are safe and of high quality. This framework includes strict measures on environment as well as responsibility in relationship with employees, customers and neighbours. Informing print buyers about the impact their choices make in these fields is important.

The brochure summarises the common positive characteristics of the printing industry in Europe. The European printing industry is a world class industry in terms of services, innovation, and product quality as well as in health and safety and environmental impact.

The European graphic industry is composed mainly of family-owned businesses. The emergence of new competitors in the eastern hemisphere have significantly altered the trade in printed goods, necessitating a review of the fundamentals of the European graphic industry if it is to face its new and aggressive competition. The Chinese graphic industry, with strong exports and internal demand, is enjoying a double-digit growth rate, and is becoming a feared competitor in particular segments of the market.

Environmental protection becomes a key differentiator. Even if significant differences persist within the 27 EU member states, Europe remains a leader in environmental performance. The legislation imposed over the past few years has been presented as being responsible for endangering the competitiveness of the European printing industry, but may now become one of its main assets. Throughout Europe, governments have promoted growth in the green sector by imposing legal limits on pollutants, by tax incentives for cleaner technology, and by levies on emissions. In Britain, such incentives were responsible for growth in wind power. What industries are spending on environmental issues may not be related just to complying with government regulations or tax breaks, but to the importance they attach to having a green image with their consumers and the public at large.”

The rise of green consumerism, in which buyers actively choose products because they are more environmentally sound, may turn out to be a potent force in cleaning up industry than government rules. The Italian government announced a ban in the coming decade on all non-biodegradable packaging. Agro-industrial giant Ferruzzi announced a plastic suitable for packaging that is the world’s first to be truly biodegradable. The number of people who will pay a bit more for a green product is now substantial. Print producers are also looking for the edge they will need to compete successfully.

However, respondents told us that European Union rules and regulations concerning “carbon footprint” may place a burden on printers, or may restrict offshore competition. The latter case could increase EU printer volumes, but prices would rise for buyers and this could accelerate electronic substitution.

2.3 The global print market

A printer in Auckland, New Zealand prints the labels for bottled water packaged in Fiji. In Singapore, half of its printing volume is exported. In Malaysia, books for elementary classes in American high schools were being printed. Thailand now processes its own foodstuffs and thus prints the packaging. A book printer in Singapore sells 70 per cent of its output to publishers in the UK, who then trans-ship those books to North America. Canadian printers have used the lower value of their dollar to compete in US markets. Western European printers have lost volumes to Eastern Europe and Russian printers. China makes much of the clothing for the world and thus prints the tags, labels, and packaging that accompany those garments. The business of print is both local and global.

Print is not one thing – it is many things:

Informational	Documents, books, periodicals, newspapers, financial/legal
Promotional	Catalogues, direct mail, brochures, collateral material
Packaging	Labels, folding cartons, corrugated, flexible
Product	Plastic cards, stationery, signage, RFID, manufacturing components
Utility	Transactional, forms, calendars, wrapping paper

Each category or print and each printed product is subject to different technological and offshoring dynamics.

If the acquired print is required within 100 miles of useage or 30 days of its ordering, it will probably remain close to home. This varies by printed product. For instance, 69 per cent of advertising (collateral) material is produced by printers 100 miles or less from the customer, and 90 per cent of that print is required in less than 30 days from its order. However, books are 2 per cent and 4 per cent respectively, and can thus easily move to offshore production, except for one-off and photo books.

TABLE 4 – Offshore print potential

	Within 100 miles	Within 30 days of use	Offshore potential
Advertising	69%	90%	Low
Books	2%	4%	High*
Catalogues	0%	80%	Moderate
Direct Mail	34%	98%	Low
Directories	57%	90%	Low
Forms	1%	50%	High
Government Information	50%	60%	Low
Internal communication	91%	90%	Low
Transactional	72%	99%	Low
Newspapers	95%	100%	Low
Packaging	6%	15%	High
Periodicals	11%	96%	Low
Quick Printing	91%	96%	Low
Technical Documentation	12%	60%	High
Miscellaneous	72%	21%	Moderate
Average	45%	70%	

* But not on-demand and photo books.

In 1980, 69 per cent of all print was purchased from a printing company within 100 miles of the customer. Today that percentage is 45 per cent and dropping. The ability to send files electronically and collaborate on-line for changes and proofing have made the physical location of the printing company less important. In fact, some European printing firms have investments in or ownership of printing facilities in Asia and other countries because of this level of communication.

The convenience factor is an important one in printer selection. In the past, local printers were available to answer questions, deliver proofs, and allow on-site press checks. Today, even with local printers, communication is by e-mail and remote soft proofing is a growing trend.

Even Governmental printing is not immune – the ballots for a New York City election were printed in Canada.

Because print is a physical product, distribution becomes an important cost factor for the print purchaser. Most print is mailed (48 per cent) or purchased at retail locations (20 per cent).

TABLE 5 – Information distribution, worldwide average

	All information	Print only
Postal service	10%	46%
Intra-company mail	3%	7%
Commercial delivery service (DHL, UPS, etc.)	1%	7%
Retail channels (stores, newsstands)	10%	22%
Free distribution (exhibitions, showrooms, etc.)	3%	9%
Other physical distribution (personal, news carriers)	1%	9%
E-mail	21%	0%
Posted on the Internet	23%	0%
Other electronic distribution (disks, etc.)	13%	0%
Faxed	1%	0%
Verbally communicated	14%	0%
	100%	100%

Print Media Distribution in a Digital Age, RiT Printing Industry Center, 2002 (updated)

Postage and shipping are now key determinants in print versus electronic promotion campaigns. Print may be commoditised in terms of price, but transportation is not. Moving print around is labour and fuel intensive.

The single technology that profoundly changed the printing industry was the electronic delivery of files. In the past, the originator delivered a manuscript for conversion to typesetting and then saw proofs; later they delivered mechanicals and then saw proofs. The printer controlled the prepress process but after 1985 desktop publishing became mainstream and the printer lost that control. This loss coincided with the evolution of the personal computer, “shrink-wrapped” software, and the standardised page description language. Jobs could be designed and produced by the originator and then sent to any printing service – or, to an in-house printing device. In the past the printer controlled the metal and later the film: the printer essentially “owned” the job. Today, the customer creates and owns the job and they can send it to any printer, anywhere on the planet.

The distribution of files has expanded the concept of distributed printing. A copy of “The Economist” sat in the lobby of a Vietnamese hotel because the files were sent to a local printer. In the past, “Time” magazine was printed in one plant; today it is printed in over 15 plants around the world. As a result, one long print run became 15 shorter print runs. This is now true of many periodicals, publications, and packaging. Packaging files created by a UK package goods company are sent to Estonia and Singapore for printing. Instead of one plant printing billions of impressions, multiple plants produce millions and thousands . . . and even tens of impressions.

In addition, marketers now order several shorter runs of promotional materials so as to avoid obsolescence, warehouse cost, and waste. Worldwide, short and long runs are about equal in number, and in time sensitivity. It is time sensitivity that keeps local printing firms in business.

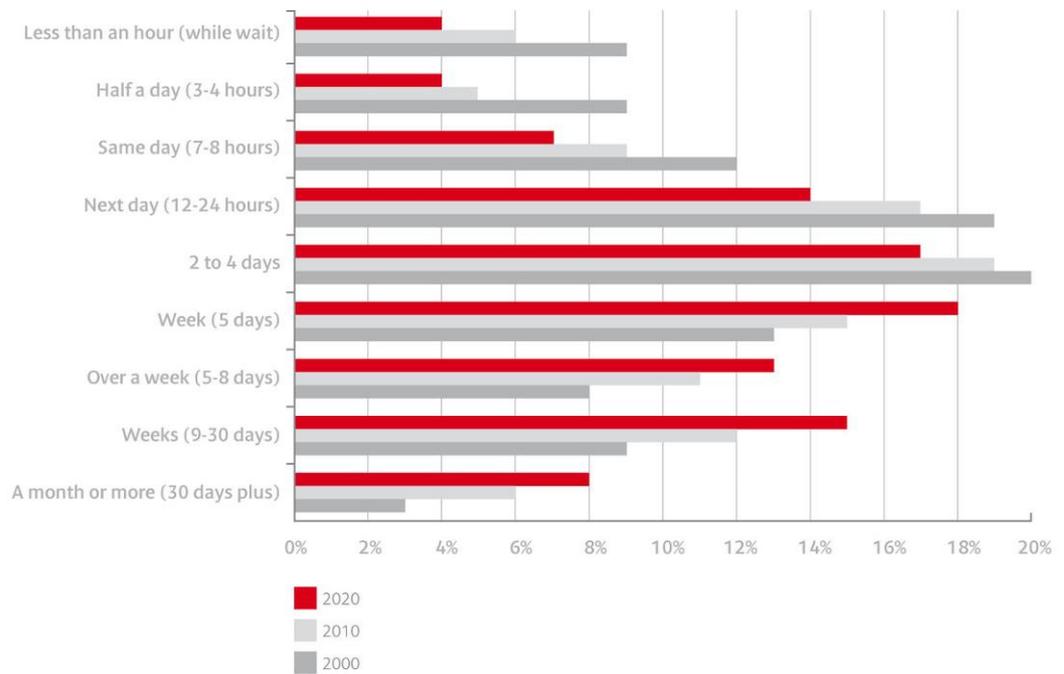
TABLE 6 – Print volumes by time and run length

Of all printed work, worldwide, by jobs

Of all printed work, worldwide by jobs	
Short run and time sensitive	45%
Short run and not time sensitive	9%
Long run and time sensitive	34%
Long run and not time sensitive	19%
Not classifiable	3%

There have been severe shifts in print production schedules and this is projected to continue into the future. In 2000, 15 per cent of jobs were produced in a day or less; this will reach 20 per cent by 2020. This means that reproduction technology and its related processes must become faster and more efficient.

TABLE 7 – Job volume by schedule



As we probed this area, we discovered that printers sell one major service – time. Content originators take more time to create a job than it takes to print a job. Printers once required months, then weeks, and now days – and, in some cases, hours – for print production. There was a time when print buyers paid a premium for rush service. That is no longer the case and many printers often win printing jobs because they have available capacity to handle the demanding schedules of customers.

The concept of on-demand printing has permeated every aspect of the printing industry, forcing changes in workflow, offset makeready, and laying the foundation for digital printing.

Turnaround schedules will become even tighter as customers squeeze more time from their printing partners. And this single factor will challenge offshore print purchasing, even though 44 per cent of major print buyers surveyed believe there is a trend toward purchasing print offshore within their company. They acknowledge that there will be an impact on local and national printing services and the print supply chain as a result of offshoring.

2.4 Job complexity

Yet, it is neither run length nor time that is the primary factor in printing company revenue - it is job complexity. Print buyers place a higher value on jobs with complex binding, finishing, or other services.

TABLE 8 - Jobs by revenue and number

	By Revenue	By Jobs	Example
Simple	18%	41%	Single sheets, simple folders
Moderately complex	22%	27%	Multiple collated sheets unbound
Complex	29%	19%	Low-page-count bound documents
Very complex	31%	13%	High-page-count bound documents
	100%	100%	

Simple jobs (mostly single sheets) may be higher in number but they are lower in revenue, and far lower in profitability.

2.5 Cost concerns

Printing costs will continue to rise according to the survey participants. Paper prices have been rising and will continue to do so. Because there is less printing than in decades previous, paper mills have been closing machines, thus reducing capacity and competition that would otherwise discourage price increases. Higher petroleum prices affect printers, too, because it is the base for ink. Transportation of printed matter is also a serious issue because of rising fuel costs.

Print providers remain optimistic that their gross revenue will continue to increase (76.8 per cent in Europe), although they recognise that costs are rising at a faster rate than prices paid to them for their products and services (89.8 per cent of respondents agreed). Despite the revenue challenges facing these print providers, almost none of them expected to exit the industry, although some were exploring mergers or other forms of partnering (29.8 per cent).

The top strategies continued to be

- 1 Reducing production costs and improving efficiency
- 2 Growing through more effective sales and marketing
- 3 Positioning capabilities to expand into new markets

The strategy of reducing production costs and increasing efficiency, a traditional manufacturing response, might be challenging as costs increase at a faster rate than revenues. Respondents agreed (72.7 per cent in Europe) that they can no longer continue to do the same thing in the same way.

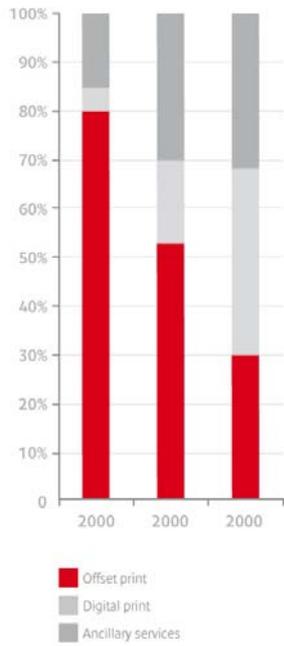
It is challenging when the price received for services remains stable while the price paid for supplies rises steadily. This constrains profitability that then inhibits equipment investment which then leads to a larger base of legacy equipment.

2.6 Revenue streams

80 per cent of print service providers worldwide expect the highest revenue growth over the next two to five years to come from digital full-colour printing - 70.1 per cent in Europe. This is due to economic conditions that force them to leverage their previous investments in legacy technology even as they agree about the improvement of digital print quality and variable data printing as an opportunity for revenue growth.

To cope with these competitive trends, printers worldwide are investigating and developing new revenue streams based on value added services - primarily because of digital printing and the value added ancillary services that they engender. Digital printing and ancillary services are now the engines of growth for the printing industry.

TABLE 9 – Commercial printing revenue streams, 2000 – 2020, worldwide

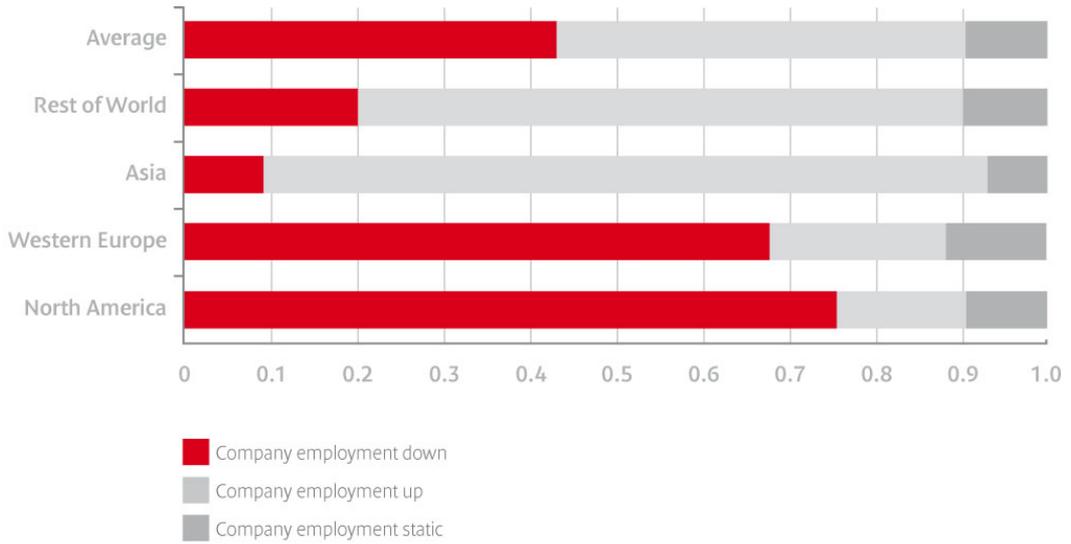


Through 2020, offset will remain a viable process, even as digital printing grows, but after 2020, new digital technology may affect offset the way that offset affected letterpress.

The term “ancillary services” is used because they are adjuncts to print. But in reality, print may become the ancillary service when one considers that digital marketing, database applications, and integrated Internet services are the keys to high profitability. Thus, print becomes a sub-set of the total job.

Offset still dominates European printing but digital printing is now growing faster than offset in acquisition of systems and volumes of work (81.3 per cent of respondents agree).

TABLE 10 – Employment trends



43.1 per cent of respondents reported that employment in their companies was down compared to 2000; however, 47.3 per cent reported that employment was up. Overall, employment in the printing industry, worldwide, is down, compared to the base year of 1995. This is due to two factors:

- 1 The number of firms that have consolidated or closed
- 2 Employee reductions resulting from automation and workflow efficiencies

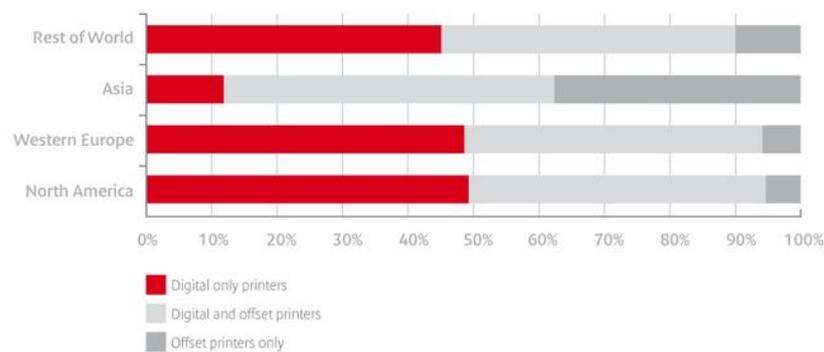
TABLE 11 – Employee and management levels, 2000 - 2020

	2000	2010	2020
Employee levels, base year 1995	94%	88%	79%
Management levels, base year 1995	91%	86%	78%
Average	93%	87%	79%

Printing firms are operating leaner in terms of both employees and management (including supervisory) personnel. This affects the time that supervisory and management staff have available for conference, seminar, or trade exhibition attendance, which has led to a growth in webinars, webcasts, and computer delivery of information.

Employee reductions and new technology appear to be related to profitability levels. Those printing firms with digital printing report higher profit levels than those without it.

TABLE 12 – Profitability has increased in last year, by percentage of firms responding



The improvement in margins is largely a result of efficiency gains and volumes being gained from companies that are no longer active. Thus, a printer with one local competitor may see a business gain from that competitor closing.

North American printers are hesitant about investing in offset at present with a 30 per cent drop of orders in 2007, but Germany is going through a record period of sales with significant purchases of offset presses, as are France and the UK, as well as Eastern Europe (where there was a 14-15 per cent growth in offset press sales in 2007). Worldwide, offset equipment sales are growing at about two per cent, mostly a replacement market. A key growth segment in the global market is packaging with annual growth of up to 4 per cent and sheet-fed printers are acquiring offset presses with the ability to handle folding carton stock, or new large format presses that are more productive.

At the same time, digital printing equipment sales are growing at about ten per cent worldwide and 11 per cent in Europe.

There are seven major applications that will feed the growth of digital printing

- 1 Short run marketing collateral (brochures, flyers, and booklets) is a leading application for colour digital printing.
- 2 Direct mail has the highest growth potential. Target marketing fits perfectly with digital printing's VDP capabilities.
- 3 One-off and very short-run books and manuals can only be produced effectively with digital printing.
- 4 Catalogue printing will grow by integrating static and dynamic content.
- 5 Business identity, which includes business cards and letterheads, will continue to grow.
- 6 Transpromo materials will integrate bills and statements with promotional content.
- 7 Colour tags and labels with versioned content are evolving rapidly.

Over the next decade, an increasing percentage of print provider revenue will come from digital printing and related services, with a decline in offset revenue. As digital printing capabilities continue to expand, digital printing will expand to print other products than those listed above and to handle longer runs.

2.7 The new workforce

The printing industry bemoans its inability to attract workers. Because most printing businesses are small and family-owned, there tend to be fewer job opportunities in those businesses, or even the economic ability to invest in long-term employee development and a potential for employees to rise to management positions.

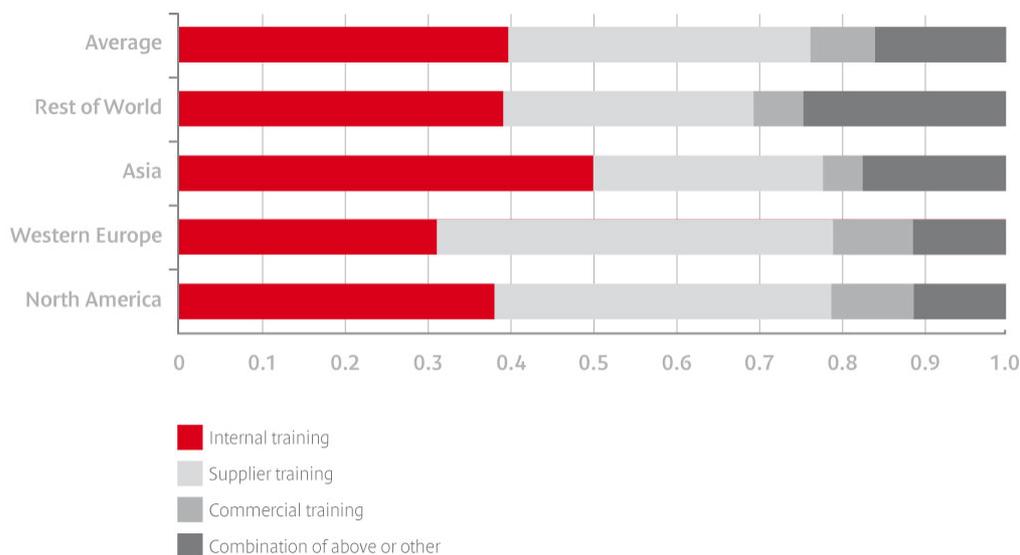
It is often found that many of the job positions printers claim are unfilled are for operators of certain legacy equipment. This equipment tends to be older, where a trained worker has retired or moved to another company where their experience on that equipment might be better rewarded because they already have the requisite skills.

It is traditional for printing companies to fill positions by hiring employees from other printing companies. This is one of the reasons for the reluctance to provide training. One printer said “Why train them for my competitor.”

In 1997, a local printer complained to the president of our university because the graduate that was hired could not do paste up, a skill that was eliminated after 1985. A company owner once complained about not being able to find a Linotype operator. The last hot metal linecaster was manufactured in 1972 in Italy. These represented old skills for old technology – that, sadly, many printers still retain.

A review of the high-profit printers around the world shows one common factor – they invest in training. Internal training is the primary method used to provide skillsets to employees worldwide – at 39.7 per cent of all printers. Supplier-based training is next at 36.4 per cent.

TABLE 13 – Training practices by percentage of users



It is startling how low the numbers are in the above table. Although print providers are happy with employee skillsets in many areas, they indicate that employees will need enhanced technical skills for pre-press, digital printing, programming, and design activities. They feel that even their current employees in customer service, sales, and senior management positions need to be more solutions-oriented. Print providers indicated a mean training budget of €1,198 per employee per year in 2007. High-profit printers invested almost twice that amount (€2,368).

For instance, the US has moved to automate the craft aspect of print production, but the German industry has maintained a strong apprentice program, training workers for the industry.

European respondents indicated that potential employees would most need industry-specific skills (51.3 per cent), followed by analytical skills (40.9 per cent) and technical skills (47.1 per cent). Three quarters of printers interviewed believe that the skillsets of potential employees would be inadequate to meet their company’s needs. Yet, only 20.8 per cent reported that would be increasing their training budgets.

2.8 Old skillsets

The skillsets of the “old” craft-based printing industry are now mostly “shrink-wrapped” – they are functions within programs that perform automatically what human skill and action once performed or they are integrated into systems provided by suppliers. Traditional skillsets have either disappeared or been integrated into other operations. The craft is still there, but it is now a programme or machine function.

Ink, Chemistry Specialist

At one time, printers mixed their own inks and chemical solutions. Ink and other suppliers have usurped this function through better consistency, service, and support.

Typesetter

Desktop publishing has eradicated typesetting as a distinct service. Graphic designers receive word processing text files and format them within page application programs. In most cases, this has not resulted in better typography because many graphic designers are not as typographically-astute as typographic professionals were.

Pasteup Artist

Pages are now composed on computer screens, usually by graphic designers, and the manual assembly of pages is long gone.

Trapping Specialist

Trapping is integrated into application programmes, CTP workflows, and RIPs.

Scanner Operator

The advent of digital photography has reduced the need for scanners, although they are still required for legacy artwork, photos, and prints.

Dot Etcher

In the days of film, the dot etcher corrected images for print using acid, X-acto knife, and Q-tips. All image enhancement is now digital. “To Photoshop” is now a verb.

Cameraperson

The graphic arts camera and its darkroom are long gone from mainstream print production.

Film Stripper/Proofer

CTP has eliminated the film assembly stage and the stripping function. No more film, no more film proofing.

Platemaker

The film-to-plate function has been replaced with CTP. For instance, in Germany, over 80 per cent of plates are produced using CTP. In the UK, about 48 per cent of plates made by sheetfed printers are CTP.

Press Assistant

New levels of press capability and automation require a more computer-savvy press person who understands computer-controlled ink-based reproduction. Press staffing has been reduced from four to three to two operators on newer presses.

These positions have been lost to automation and workflow integration. Digital workflows have been most responsible for the elimination of analogue skillsets.

2.9 Crossover skillsets

Skillsets common to the “old” world of printing and the “new” world of printing:

Designer

Pre-designed templates may provide selections of layout and design, but creativity may not be “automatable.” Creativity will always be in demand.

Preflight Technician

It is essential to discover missing items/errors in customer files, correct files, and prepare files for output to print devices. This function is now critical because 82 per cent of submitted files have some problem to be resolved.

Image Specialist

This function corrects or enhances colour images, applies colour and printer profiles, and organises them for print. Adobe Photoshop has changed the nature of imagery.

Prepress Specialist

This function handles fonts, digital images, corrects photos, and maintains colour management profiles for all systems. This person requires familiarity with major application programs so that submitted files may be examined and repaired.

Print Broker, Salesperson

The sales function is increasingly applying Web-based job entry and tracking. Customer-facing personnel will long be needed even as an increasing amount of print is acquired online.

CSR

Customer Service Representatives use e-mail to communicate with customers and keep track of jobs and specifications. They are the liaison between plant and customer.

Estimator, Planner, Scheduler

MIS systems automate estimating but someone must still enter all variables. Imposition, or arranging multiple pages or graphics on a large press sheet or pagination of sheets, is now primarily electronic.

Bindery Specialist

The set up of offline finishing systems is still a specialised skill. There may be many bindery workers, but there are only a few specialists who set up the mechanical finishing systems.

2.10 New skillsets

The new functions and skillsets of the digital world are mostly based on IT – Information Technology. They involve programming and computer-related skills:

Database Analyst

This function analyses databases, converts them into useable form, performs data hygiene (cleans up data for consistency). Subsets of Oracle and other enterprise databases are output as flat file ASCII fields and records for organisation and operation.

VDP Specialist

In order to produce personalised products, one must link databases and image archives to page layouts using special-purpose programs. This position works with marketing, database, and design personnel.

Digital Asset Specialist

Maintain archives of text, art, and image files and track changes and usage. Printers are increasingly working with clients to implement and maintain Digital Asset or Digital Content Management systems.

Digital Printing Technician

Perform colour calibration where necessary, paper handling, job specification and monitoring, system periodic maintenance, consumables replacement, and online bindery operation where applicable. May handle multiple printing systems.

Quality/Environmental Specialist

Analyse plant waste and spoilage, substrates, quality practices, recycling, and other environmental practices. Monitor and apply applicable regulations and reportage.

IT Specialist

Perform computer updates, install new system and applications software, maintain networks, establish system security, install new computers, integrate workflow modules, set up Hot Folders, handle Internet tasks and programming, such as Java, Flash and Website programming.

Networking Specialist

LAN and wireless services integrator for all equipment within the facility and with outsiders. Monitor and maintain FTP site. May be integrated with IT Specialist.

Distribution Specialist

Apply postal regulations, mailing formats, shipping alternatives for distribution and fulfilment of jobs. Establish distribute-and-print relationships with other facilities.

Marketing Specialist

This skillset would have two facets: Establish company promotion programmes, handle exhibitions, research new markets, develop marketing programs for the printing firms, and work with customers on their marketing programs.

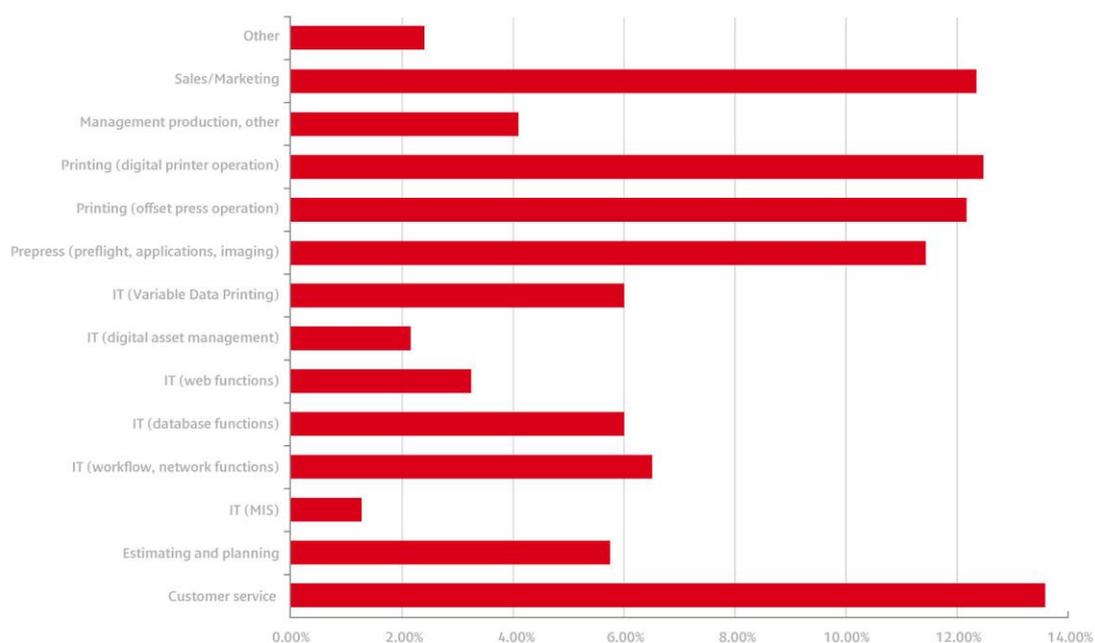
Within some positions there may be echelons of personnel. There may be an IT Manager or Director, an IT Specialist, or an IT Programmer, for example, each at a different wage level based on ability and responsibility.

2.11 The IT connection

A skills ‘gap’ implies an area where individuals within an existing workforce have lower skill levels than are necessary to meet business or industry objectives, or where new entrants lack the skills required for them to perform effectively. A skills ‘shortage’ is where there is a lack of adequately skilled individuals in the labour market. In the printing industry, we have both a skills gap and a skills shortage.

We noted that print providers refer to skills shortages based on legacy equipment and processes – 37 per cent of our survey population have sought employees to operate older presses (Europe 42.1 per cent), workflows, pre-press systems, etc. What is most interesting is that 67 per cent of new employees retained by the survey population had IT-based skillsets (Europe 61.1 per cent). It is also interesting that printers in the survey hired almost as many digital printing employees as traditional press operators, at 12.11 per cent versus 12.48 per cent (Europe 10.2 per cent versus 13.9 per cent).

TABLE 14 – New hiring by job functions, worldwide



European percentages are not significantly different.

About one quarter of all new hiring in the printing industry worldwide involves IT-based functions. Some printers do not always define these skillsets as IT-based. Many find it more expedient to hire from other printers rather than develop other recruitment channels, such as university graduates.

Much of the hiring remains in the area of legacy skills – around 40 per cent if you count customer service, estimating/planning, prepress, and printing. If some printers continue to retain older equipment, they will continue to face shortages of operators for that equipment and these shortages will exacerbate over time. Without the automation and quality-enhancing features of newer systems, these devices will no longer be able to meet buyer requirements.

Finding a solution to skill shortages requires a strategic, coordinated response from industry, the enterprise itself, and educational/training organisations. Industry needs to provide a long-term action plan; enterprises must promote solutions within the workplace; and education/training providers must broaden their approaches to traditional training.

Proactive employers in the printing industry are addressing skill shortages with strategies that include:

- 1 introducing new technology to reduce the need for highly qualified staff
- 2 insisting that equipment and system providers update the content and delivery of their training

The heart of the skill shortage problem is that industry lacks both a far-reaching vision and a long-term strategy for dealing with the future workforce requirements of the printing industry.

A core issue is a mismatch between the training currently being given and the skills actually required to compete successfully in the new printing industry environment:

- improvements in the productivity of printing businesses brought about by technology advances
- changes in demand for traditional print products (more colour, variability)
- the cannibalisation of traditional print products by other media (electronic substitution)
- technological sophistication of new equipment that does not require traditional apprenticeships

Successful printing companies are not of a particular size; they are businesses that view themselves as being in the communications industry, not in the ink-on-paper business. They have robust internal IT capability and invest in training. They embrace both.

2.12 What is IT?

Information Technology analyses, creates, maintains and supports applications and databases and deals with the use of computers and telecommunications in the design, development, installation, and implementation of information programs and systems. IT encompasses the use of hardware, software, telecommunications, database management, websites, and other information processing technologies used in computer-based systems to create, store, retrieve, transfer, process and present information. Very simply, IT involves anything to do with computers.

In 1980, setting-up a four-colour printing job took well over one hour at the press. Today it takes about 15 minutes. Paper waste has been reduced by a factor of five, while productivity has increased by an estimated 41 per cent. But these statistics cannot compete with digital printing at zero makeready and zero waste. Most of these benefits have arisen from the high levels of automation incorporated into workflows and equipment – because of IT.

CTP forced the printing industry to implement totally digital workflows – because of IT. Digital printing devices integrate significant levels of automation to control virtually every aspect of the document – because of IT.

IT skills are becoming an essential new competency of print producers who want to distinguish themselves from competitors. Printers with up-to-date IT capabilities can combine task-specific software from multiple vendors for e-commerce to facilitate sales, transactions, and communications with customers. Printers also need IT skills to set up web catalogues and design template programs for specific customers, automate internal processes and improve management control over pricing, costs, and productivity. More importantly, internal IT resources can be used to customise software for e-commerce or general-purpose printing functions to gain competitive advantages or set up interfaces with major customers that cannot be easily duplicated by other suppliers.

IT people and systems engender differentiation and differentiation engenders new profit streams.

Businesses have had difficulty finding “hybrid professionals” trained in technology and possessing both business and industry-savvy. There are more than enough new graduates from universities each year to fill the available technology jobs, but some believe that there are many more experienced IT workers out of the market who are unemployed or underemployed or those who left IT during a period of unemployment following the dotcom bust.

2.13 IT education

Information Technology and Computer Science are inter-related disciplines that involve the understanding and design of computers and computational processes. They are concerned with the understanding of information transfer and transformation while endowing them with some form of intelligence. The disciplines range from theoretical studies of algorithms to practical problems of implementation of computational hardware and software.

Information systems specialists focus on integrating information technology solutions and business processes to meet the information needs of businesses and other organisations and enable organisations to achieve their objectives. They have abilities in these disciplines:

Disciplines		
Artificial intelligence Computer science Computer engineering Computer science Database engineering Graphics Human computer interaction	Network engineering Operating systems Performance engineering Project management Robotics Scientific computing Software architecture	Software engineering System administration System design System security Thinking/Problem solving Web systems design
Related areas include:		
Cognitive science Digital library science E-commerce Information science	Information systems Info security and privacy Instructional design Knowledge engineering	Management information systems Multimedia design Telecommunications

Because the IT field is dominated by professional specialties, not just intellectual disciplines, its students need to be immersed in practice as much as in a study of concepts and principles. They need to learn to be professionals, which means they need to learn and embody their specialty's body of knowledge, its standards of practice, and its codes of conduct. In other words, there needs to be a convergence of print and IT education. How does this translate into areas important to the printing industry? The new skillsets may be translated into these areas of knowledge:

Areas of knowledge:	
Colour calibration Colour management (profiling) Database analytics and manipulation Digital marketing Distribution channel applications Finishing automation (robotics) Flash programming	Internet systems Java programming Networking, wireless Postal regulation applications Quality analysis and control Web programming Workflow (Hot folders etc)

The last piece of the puzzle is then printing industry training for these IT employees. Courses are now offered by associations and educational institutions that involve an "introduction" or "orientation" to the graphic arts. New curricula for higher-education degrees are being developed to integrate IT and print.



THE INSIGHT REPORT

new applications and print products

3

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Static vs. dynamic printing

Digital printing involves any reproduction process that does not use a static image carrier (such as a plate). Every page impression is re-generated, even if they are the same. Digital printing can use any method that places spots of coloured particles on substrates, with toner and inkjet being most common.

Most printing is static – make one plate and then print many impressions. This concept may exist for decades because there will be long runs for a long time. But, at the same time, dynamic printing is growing and it will eventually be cost-effective enough to be applied to long runs.

Static printing refers to traditional ink-on-paper approaches – offset lithography being the most common – where each and every sheet is reproduced from the same image carrier fixed with the same image. The copies look exactly the same. Toner-based printers use an image carrier that is imaged each time it passes by, re-imaging for each copy. The copies look the same, but each is generated individually. Inkjet-based printers have no image carrier, but also re-generate the image every time. Dynamic printing means that the printer re-generates the image for every page; thus, every page can be different.

Process Differences	Static (offset printing)	Dynamic (digital printing)
Image carrier	Fixed	Variable
Material	Ink	Toner, Inkjet
Quality	High	Moderate-High
Variability	None	High
Quantities	Moderate-to-high	Low-to-moderate
Paper choice	Contracting	Expanding
Sheet Size	Small to very large	Small to moderate
Documents	Moderate-long runs	Short-to-moderate runs

TABLE 15 – Printed products by process, based on volume, worldwide

	All print	Digital print	Digital print application
Periodicals	10.0%	4.3%	Personalised wraps
Newspapers	9.4%	1.8%	Bespoke information
Books	7.2%	11.0%	On-demand books
Catalogue	9.6%	4.2%	Order forms
Direct Mail	7.0%	10.5%	Personalisation
Directories	5.5%	5.5%	Regionalised versions
Financial / Legal	5.8%	5.7%	Transactional, transpromo
Packaging	10.7%	8.9%	Labels
Documentation	4.9%	3.4%	Versioned manuals
Advertising	15.5%	27.9%	Short-run collateral
Stationery	7.2%	6.3%	Photo business cards
Forms	3.0%	6.1%	Versioned materials
Miscellaneous	3.0%	6.1%	Personalised calendars
	100%	100%	

Direct Mail, some Packaging, and Financial/Legal (the latter includes transactional) apply hybrid approaches where static print is combined with dynamic print. We have allocated volumes as appropriate – about 11 per cent of all printing worldwide is hybrid.

The advantage of dynamic printing is that the re-imaging for each sheet lets you do things you cannot do with a static printing press:

- Print immediately because there is no significant set-up time (time advantage)
- Each sheet can be personalised to a person or company (personalisation advantage)
- Material can be versioned with different copy, such as branch locations (versioning advantage)
- One multi-page document (book) at a time can be produced using electronic collation (publication advantage)
- Faster setup with virtually no chemicals or waste (environmental advantage)

You can only do all of these things on a digital printer. The present advantage of static printing is the cost-effectiveness of long runs.

Over the next five years, offset lithography may see technology advances that include plateless printing, with re-imageable technology. This will reduce makeready time, but there will still be makeready, which includes non-productive time and waste generation. Digital printing requires virtually no makeready and generates no waste.

A strong advantage of digital printing is the ability to frequently update the content of the material being printed. Because of the minimum run length requirements of offset printing, offset products are typically published in runs of 2,000 - 3,000 copies or more. Newer offset presses reduce makeready and thus may be able to handle runs at about 1,000 - 2,000 - but profitability in the offset world is still based on extended runs lengths.

Digital printing allows run lengths that are much shorter to be cost-effective. Information can be updated immediately through delivery of a new file. The most accurate, up-to-date publication can then be produced either periodically in short or medium run lengths, or on-demand at a customer's requirement and convenience.

For short runs, the turnaround time offered by digital printing cannot be matched by any other printing process. The best turnaround time that conventional press operations can offer is an hour to a few hours. This is, of course, assuming the press isn't scheduled for other use. Digital presses offer turnaround times of 10 to 30 minutes because jobs may be interrupted and then a previous job resumed.

3.1 Run length trends

Digital printing (coupled with makeready reduction on newer offset presses) has both enabled and reacted to changes in job run lengths. Printers worldwide report that the long runs of the past are disappearing. As early as ten years ago gravure-printed magazines and catalogues with runs over one million copies were common. Today, such runs are few in number.

The major shift in run length trends has been the run length of one. This has grown because of copier volumes, one-off books, and personalised direct mail.

TABLE 16 – Run length trends based print and copier volumes, worldwide

	2000	2010	2020
Short			
1	8%	15%	19%
2-500	17%	18%	18%
501-2000	14%	15%	16%
Moderate			
2001-5000	13%	14%	15%
5001-10,000	10%	8%	7%
Long			
10,001-50,000	11%	8%	6%
50,001-250,000	11%	9%	8%
250,001-750,000	7%	6%	5%
750,001+	9%	7%	6%
	100%	100%	100%

Thus, 48 per cent of all printing and copying is in runs of 2,000 or less, by jobs (Europe 51.1 per cent).

Moderate runs are 22 per cent, essentially holding steady, and long runs are at 30 per cent, projected to drop to 25 per cent.

When respondents reported on offset-only volumes, offset short runs (2,000 and under) were at 4.3per cent.

TABLE 17 – Runs on offset presses, worldwide, 2007

	North America	Western Europe	Asia	Rest of World	Average
1,000 or less	1.2%	1.9%	0.8%	0.9%	1.2%
1,0001 - 2,000	1.9%	2.8%	3.9%	3.8%	3.1%
2,001 - 3,000	2.1%	3.8%	5.7%	5.5%	4.3%
3,001 - 4,000	4.8%	4.2%	6.1%	6.2%	5.3%
4,001 - 5,000	7.3%	7.8%	12.6%	12.8%	10.1%
5,001 plus	82.7%	79.5%	70.9%	70.8%	76.0%
	100.0%	100.0%	100.0%	100.0%	100.0%

But, short runs (2,000 or under) on digital printers were at 44.5 per cent as shown in Table 18.

TABLE 18 – Runs on digital printers, worldwide, 2007

	North America	Western Europe	Asia	Average
1,000 or less	21.2%	23.1%	24.0%	19.5%
1,001-2,000	23.3%	24.0%	21.6%	21.1%
2,001-3,000	22.0%	21.3%	21.0%	22.0%
3,001-4,000	16.1%	16.4%	18.1%	21.2%
4,001-5,000	8.3%	7.1%	8.2%	8.0%
5,001 +	9.1%	8.1%	7.1%	8.2%
	100%	100%	100%	100%

There are three devices that are involved in the replication of information on paper – the copier, printer, and press. Copiers were defined by their need for hard copy originals, printers by their need for digital files, and presses by their need for plates.

TABLE 18 A- Runs on digital printers, total worldwide, 2007

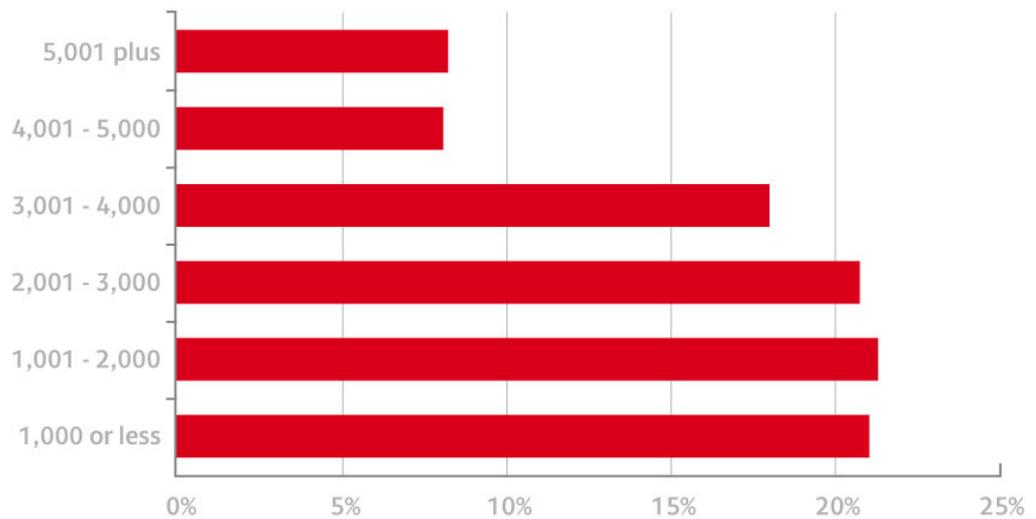
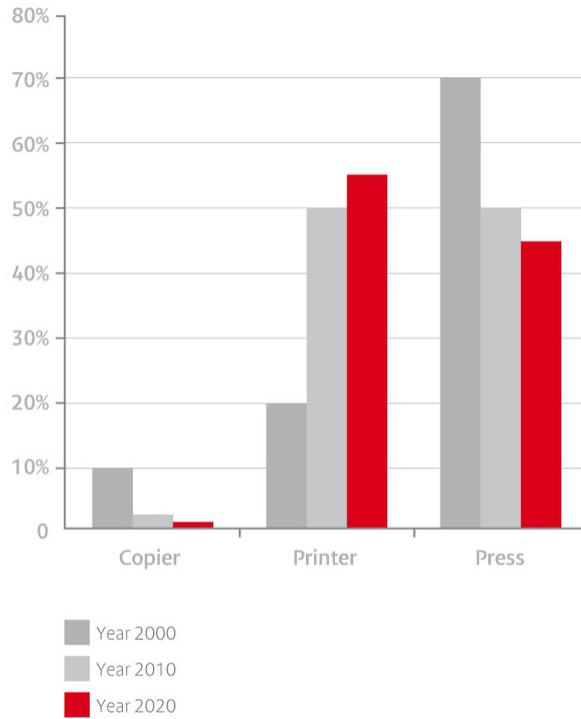


TABLE 19 – Reproduction device location, 2007, by volume of pages



Copier volumes were high because hard-copy workflows print the pages on a digital printer and then copy them. But now most of these original pages are in digital form. Thus the market is changing and more files are being sent directly to MFPs and digital printers. By the year 2010 copier volumes will decline and then disappear by 2020. The copier is metamorphosing into a digital printer.

	Copier	Printer	Press	Total
Total - Year 2010	2%	49%	49%	100%

By 2020, the digital printer will be the dominant printing device, in our opinion. Offset will still be a viable process until 2020, but will decline significantly after 2020.

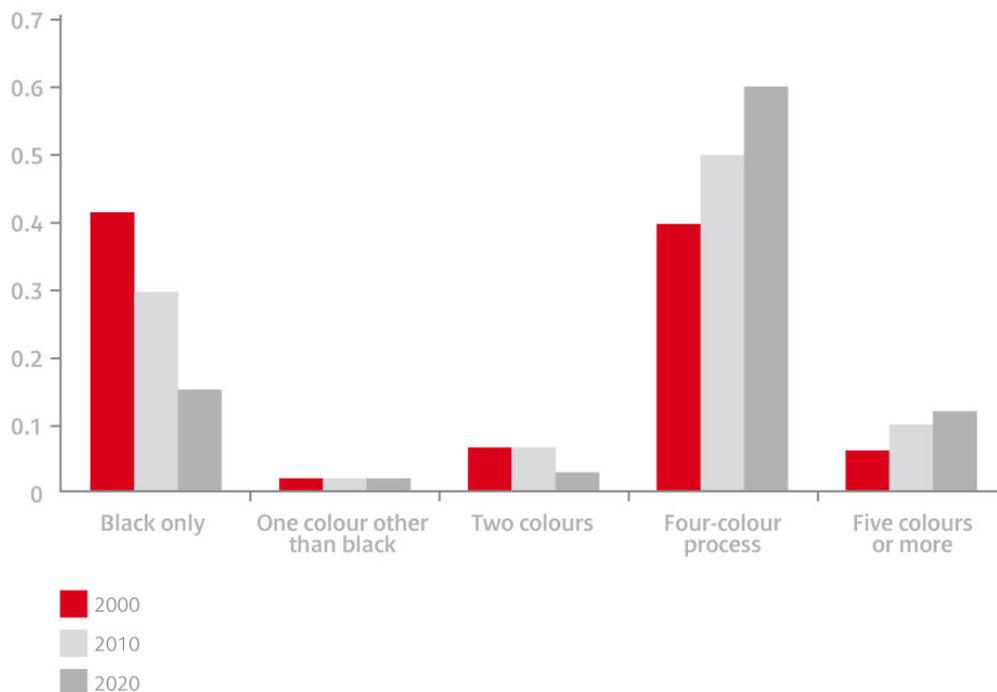
	Copier	Printer	Press	Total
Total - Year 2020	0%	58%	42%	100%

This means that users of copiers will become users of digital printers.

3.2 Colour trends

The movement to full-colour reproduction continues. Monochrome volumes continue to drop.

TABLE 20 – Printing volumes based on colour, 2000 – 2020



The rate of page volume growth in digital colour printing is now about 51 per cent annually worldwide (51 per cent in Europe). New page demand will be the major force behind this growth. In addition to digital applications and work diverted from offset presses, a large amount of colour pages will come from work that is printed on digital monochrome copiers and printers. When users have more access to colour they will find more applications for colour on a page.

Multi-page bound documents apply colour predominantly for the cover and internal components are often a mix of black and white and colour pages. As digital colour capabilities continue to become more efficient and economical, colour will increase for internal pages of bound documents.

The use of charts and graphs, imagery, and photos will grow because of the prevalence of spreadsheet software, digital cameras, and graphical programs. Just as offset allowed more colour in magazines, newspapers, textbooks, manuals, and a host of other long-run publications, so it is allowing more colour in all short-run applications.

3.3 Variable Data Printing

The terms personalised printing, versioned printing, and variable data printing are used synonymously, but there is a slight difference between each. We noted that these definitional differences were worldwide. We present four major categories and seven sub-categories:

POD

1. Publications on demand

Books or other multi-page documents assembled with electronic collation. One-off books, photo books, and other books, booklets, and bound publications are possible.

Mail Merge

2. Name and address only on envelope or on outside of mail piece

Correspondence-level direct mail with only the address personalised. A message may also be printed on the envelope or self-mailer for each recipient.

3. Mail merge (name and address and salutation)

One can personalise the letter with a salutation and the envelope with name and address and then insert the right piece in the right envelope, or personalise the letter and use a window envelope (the most common approach).

Versioning

4. Integration of static and dynamic copy

Minimal variable text on first and last page – different store locations or sales office addresses and perhaps directional maps.

5. Document assembly (assemble pre-written paragraphs)

Sometimes called “boilerplate,” because like a plate, it was unchanging and the document is assembled from these pre-written text units that are selected according to the database. Rules-based database and images merge with arrangement of the information dynamically.

Hybrid

6. Hybrid documents (personalised and static pages mixed)

The static material is printed, usually by offset, and then the sheets or roll are run through a black-and-white digital printer for personalisation. Direct mail post cards, self-mailers (called “shells”), and transactional printing using pre-printed sheets or rolls are hybrid documents.

Full Variable

7. Database and image merge (link to database and images)

At this level, both text and images are integrated into the document based on the database and personalisation program. Transpromo documents are full variable. The real power of VDP is best fulfilled when images are meaningfully integrated with text.

TABLE 21 – VDP usage, based on pages

	North America	Western Europe	Asia	Rest of World	Average
POD					
1. Publications on demand	21.2%	24.1%	19.3%	15.3%	20.0%
Mail Merge					
2. Name/address on envelope/outside mail piece	12.1%	11.4%	13.1%	16.2%	13.2%
3. Mail merge (name and address and salutation)	9.1%	8.1%	7.1%	8.2%	8.1%
Versioning					
4. Integration of static and dynamic copy	12.2%	9.3%	10.2%	12.0%	10.9%
5. Document assembly (pre-written paragraphs)	11.3%	16.1%	18.2%	18.1%	15.9%
Hybrid					
6. Hybrid documents (personalised/static mixed)	22.0%	21.3%	26.0%	22.0%	22.8%
Full Variable					
7. Database and image merge (database/images)	12.1%	9.7%	6.1%	8.2%	9.0%
	100.0%	100.0%	100.0%	100.0%	100.0%

Almost all respondents expect that the application of VDP in all of its forms will grow, and that full variable may grow the fastest because of transpromo applications and the increased use of variable imagery in other materials.

There will be differences in the growth of certain categories based on privacy laws, mail service, and other factors in each country.

3.4 Target marketing

Direct mail is a cost-effective marketing medium. Few other media are as measureable. Sixty three per cent of marketers predict that their direct mail expenditures will increase in the next year and most say that it will be by about 29 per cent.

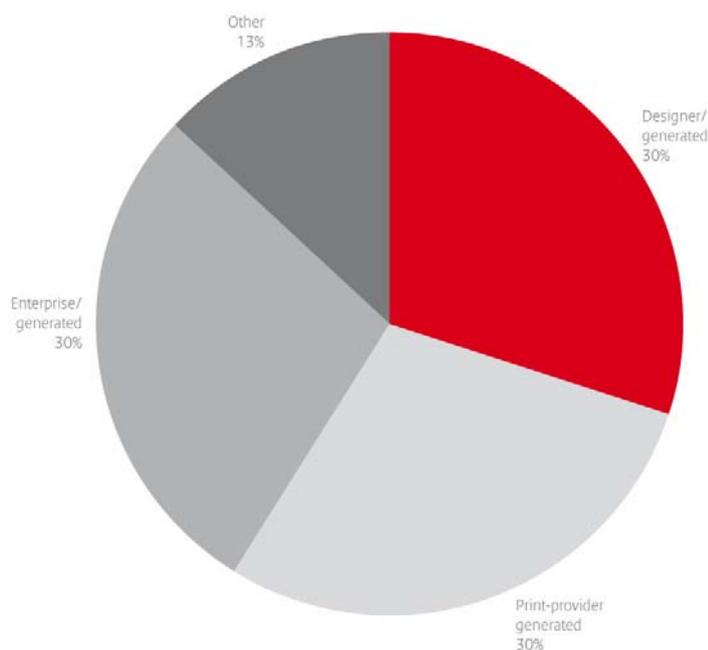
The day of mass marketing may be coming to a close. Instead of marketing to the averages, we will market to the differences – run lengths of one. We market to acquire new customers or to retain existing customers. It costs five times as much to get a new customer as it does to keep an existing customer; yet, many marketers allocate six times as much to generate new customers.

Personalised, customised, or variable data printing offers a new value added proposition that has been proven to improve response rates, provide improved customer service, decrease overall costs, reduce time to market, and enhance productivity. Personalisation – and colour – can yield significant improvements in direct marketing promotional programmes.

All variable data printing workflows start with a marketing objective, which is translated into a physical promotion piece. The decision is then made as to whether the piece will be static or variable. If variable, a search is made for applicable databases. It would be far better if the idea started with the database. A designer creates the text and graphics and indicates where database information would be used.

From a creative and production point of view, VDP projects are originated by designers, print providers (with their own designers), and enterprises (as in the case of transactional and transpromo).

TABLE 22 – Origination of VDP direct marketing, by units produced, worldwide



Most VDP is still relatively simple with only a few fields derived from the database.

TABLE 23 – Complexity of all VDP direct marketing, by units, worldwide

Simple VDP	45%	POD or mail merge
Moderate complexity	21%	Versioned
Complex VDP	34%	Full Variable
	100%	

Most VDP today is simple or moderately complex (66 per cent). However, as skillsets improve and marketers understand VDP value, more complex (more links to database and imagery) VDP will grow. Most importantly, the more complex the application, the greater the profitability.

3.5 Transactional and transpromo

Since the advent of computers, transaction printing has been a primary printed product for any company that sends bills, statements, or other material based on a financial relationship between the sending company and its customers.

Usually under the responsibility of the MIS or IS department and its data centre, the technology for printing transaction documents has evolved from typewriters to high-speed character and dot matrix printers to toner-based and inkjet printers. All transaction-based printing systems have increased in speed over the last two decades in order to accelerate the printout and mailing of bills and invoices, as such items directly influence recipient payment timing and the sending organisation’s cash flow.

Transaction printing is database printing. A large part of database printing involves financial information, such as statements and invoices, which we call “transactional.” Targeted promotional direct mail marketing pieces are also database printing, but are produced with different workflows by other areas of the company, such as the in-plant printing operation. Sheets or rolls may be pre-printed using offset litho or other ink-based processes, but variable data printing is needed to print the database on paper.

TABLE 24 – Transaction documents, by pages, worldwide

Transaction documents	
Bills / invoices	32%
Statements	24%
Other	9%
Policies	8%
Coupons	6%
Cheques	5%
Contracts	4%
Pension / retirement information	4%
Proposals	3%
Account information	3%
Purchasing / trade documentation	2%
	100%

Of all transaction documents mailed, just over half have advertising or informational inserts in the envelope:

- Inserts 56%
- No inserts 44%

This is because of minimum postal weight eligibility requirements – for instance, the minimum weight may be one ounce which would allow additional pieces in the envelope without exceeding that ounce. The primary mailers of transaction documents, by pieces, are:

TABLE 25 – Major transaction document mailers, by volume, worldwide

Major Transaction Document mailers	
Credit card companies	17%
Banks	16%
Telecommunication companies	12%
Retail / Wholesale firms	10%
Utilities (Gas, Electric)	9%
Government	9%
All other financial services	8%
Medical services	8%
Catalogue / Mail Order companies	8%
Publishers	7%
Cable TV firms	5%
Other	8%
	100%

Transaction printing in colour is growing as new full-colour printers, both toner and inkjet, enter the market. These machines will allow companies to include advertising messages as a part of the bill or statement and eschew the use of inserts. This gives rise to the concept of the “transpromo” document.

Because transaction document volumes may not be sufficient to justify the new colour printers, we envision that some volume of company direct mail volume will move to these machines with the convergence of transactional and promotional printing. It is also probable that some volume of transaction documents will disappear as customers choose Electronic Bill Presentation and Payment (EBPP). Lower volumes of such documents which must be mailed may cause organisations that now print their own transaction documents to outsource them to commercial printing services.

Overall, transaction printing volumes may be declining slightly, but other database volumes are increasing. The credit card market and the retail market have pushed into new forms of promotional marketing. Department stores and other retailers are using coupons, customer relationship materials, and other printed incentives to get consumers to call, click, or visit. The definition of a “transaction” document is changing – it now includes more of the marketing department than the finance department.

Postal rate increases are an issue for anyone who mails, and rate increases will affect mass mailings more than targeted mailings. The cost of postage for a printed piece is now more than the cost of the printed piece itself. Thus, companies using transaction printing have an incentive to either force customers into electronic transactions in order to reduce print volumes or to increase the value of the transaction document – making it promotional as well, so that there are increased revenue streams.

Less than 15 per cent of the worldwide population has chosen Electronic Bill Presentment and Payment. Some companies may charge customers for printing and postage as a strategy to reduce print volumes, but this can result in strained customer relations.

Transactional mailings often promote additional services to customers, using either messages printed on the statement or reply envelope or inserts stuffed in the envelope. Inserts have long been a feature of transactional statements. However, statement inserts usually suffer the fate of junk mail – the dustbin.

Messages printed on the statement may have limited marketing impact if the statement is printed only in black. Marketing messages printed in colour, right on the statement, are in our future. Financial firms, for example, are already printing limited volumes of sheet-oriented colour statements for high-net-worth customers.

Most transaction documents are digitally printed on pre-printed stock. This is also how most direct mail is printed — using pre-printed “shells” that are toner (laser) or inkjet imprinted, mostly with address information. It is cost-effective, but there is no ability to vary colour images. Full-colour printers will negate the need for pre-printed stock, a cost that must be factored into any ROI.

Transaction printing is usually produced on continuous-feed monochrome devices that run at a few hundred pages per minute. (The terms “continuous feed,” “roll feed,” and “web feed” refer to the same approach.) In the last two years, some companies have applied cut-sheet colour printers for credit card and other transactional mailings.

As with offset printing, the transaction printing market will remain at a 50/50 split when it comes to sheet and roll printing:

TABLE 26 – Digital page impressions, worldwide

	2000	2010	2020
Sheet	50.6%	50.6%	50.0%
Roll	49.4%	49.4%	50.0%
	100%	100%	100%

Several trends are evident:

1. Transactional print volumes have declined slowly as some customers move to EBPP.
2. Targeted direct mail volumes are growing.
3. New digital printers bring colour to both the transaction and direct mail markets. The average bill or statement will apply more colour, mostly for advertising messages.
4. The transaction and direct mail markets will converge as a result of printing technology and new marketing approaches. This convergence gives rise to the transpromo document—part bill or statement and part marketing vehicle.
5. Lower volumes of transaction documents will open the market for commercial services to attract business from the data centre and in-plant operation and aggregate multi-company volumes for postal cost efficiencies.
6. The convergence of transactional and promotional messaging in the same document may influence the convergence of the MIS and in-plant operations.

We can define documents as:

- Informational documents: Documents that contains information that has minimal impact on the business and the customer, such as privacy notices.
- Critical: If the document is not issued, it affects the business. These are the typical transactional documents such as bills and invoices.
- Value added: Documents that are statement or transactional documents with extra information that creates value for the business or the customer, such as marketing messages, brand reinforcement, corporate communications, and coupons.

Value added information is provided today through inserts that are included in the envelope.

Transaction print jobs are different from promotional or publishing print jobs in that the print controller does not know when the job starts or ends. It may be printing a hundred, a thousand, or a few million impressions before the job ends. A book or magazine has a number of pages that constitute a single document and digital printing system controllers ingest the entire job, arrange resources and then begin printing the last page first so that what is produced is a document with the user seeing the first page first. The promotion/publishing model does not work for transaction printing.

Transaction printing and direct mail are related:

- 1 Both are mailed.
- 2 Both are personalised, at least in terms of addressee.
- 3 Both have limited page counts (at present).

Despite the increased use of the Internet, paper-based communication continues to grow as it relates to direct mail with slight declines for transaction documents. Transpromo represents the convergence of transactional and targeted marketing information in a single colour document. Transpromo enables business documents to contain:

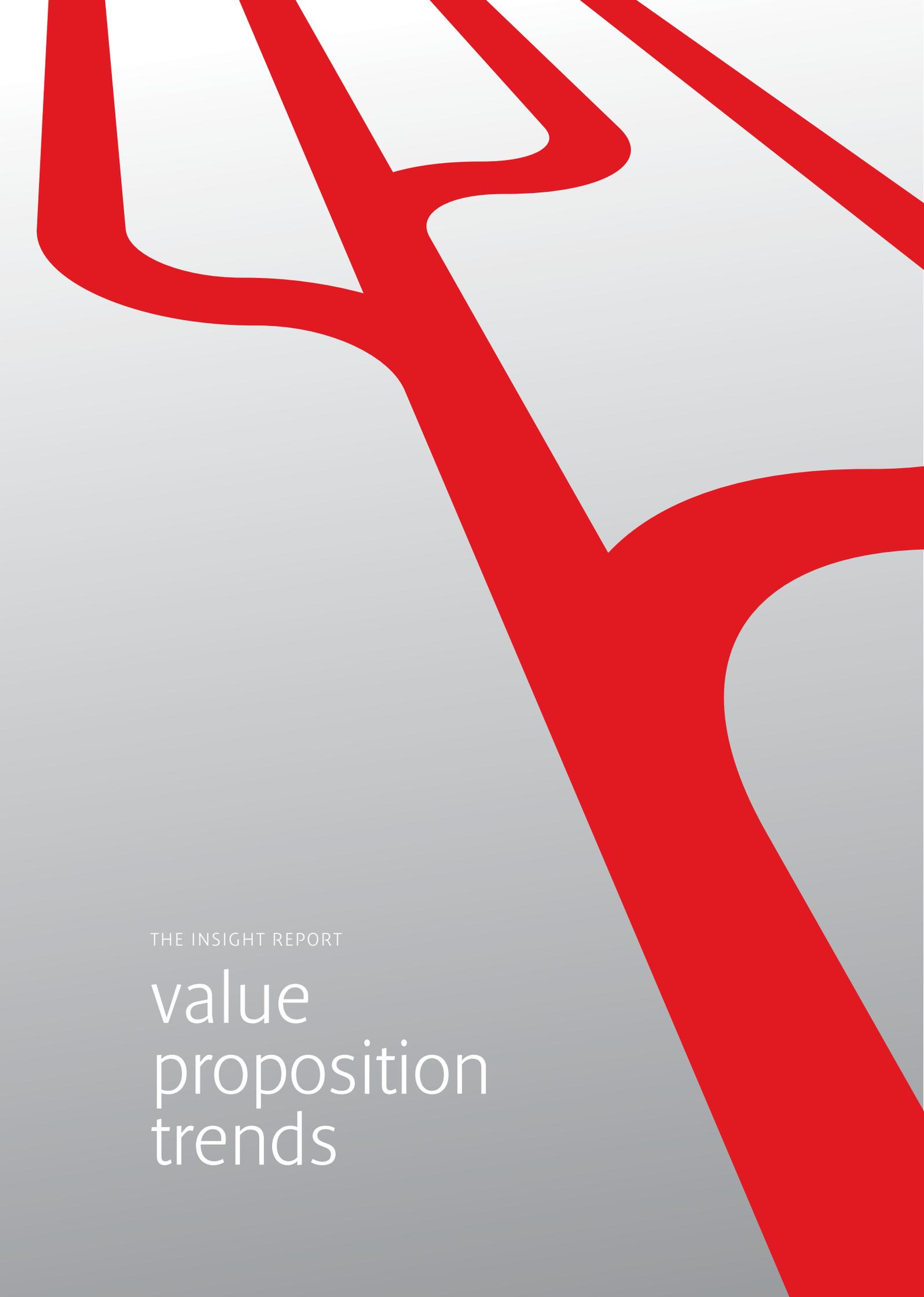
- Graphical representations of transactions to add interest (charts and graphs)
- Dynamic content and personalised messages to appeal to the reader
- Marketing advertisements in colour or black-and-white
- Information to cross-sell additional products and services
- Third-party advertising results in a new revenue stream for the bill/statement sender

Security concerns are the main reason consumers do not want to switch to on-line banking. Although PDAs and mobile phones will be primary motivators in moving some people to EBPP because of convenience. Consumers continue to have a high preference for direct mail over other forms of marketing. However, only one third of the direct mail currently received contains content that recipients find useful. This is because databases are not being applied intelligently – companies are not leveraging the knowledge they have of their customers.

Transaction documents are the ultimate “mission-critical” documents. They are among the few types of mail that are always read. Organisations are investigating new and more efficient means of producing and distributing these documents, and this has resulted in the so-called transpromotional category.

Direct mail and transaction document volumes drive output in the data centre print environment. The data centre print opportunity includes digital printing functions that support computer-based information processing tasks for “mission-critical” production of host/mainframe data.

The core competencies required to play in the document market relies on a combination of IT capabilities, including data management, workflow, and networking. Printing is merely a peripheral activity and it will remain in-house so long as reasonable business cases can be made for it. Cost will be the least important criteria as verifiable benefits can be identified and quantified.

A large, abstract, thick red graphic element that resembles a stylized, flowing shape or a calligraphic stroke, set against a light gray background. It starts from the top left and curves downwards and to the right, ending near the bottom right corner.

THE INSIGHT REPORT

value
proposition
trends

4

Value Proposition Trends

4 | Value Proposition Trends

Back in the 1950s and 1960s printers worldwide found a major cost advantage in switching from letterpress to offset. Much of the savings was in pre-press, but overall the printing industry was able to absorb an entirely new technology while maintaining an existing pricing structure.

Hot metal and letterpress were expensive and print buyers were accustomed to paying high prices because print required unique skills and competitors were few and far between. After offset became mainstream, the barriers to entry fell and we saw a phenomenal growth in the number of printers. This engendered higher and higher levels of competition as more and more printers competed for the base of work. This period saw the rise of quick printing and the birth of many new commercial printers. Fortunately a robust and growing print volume could sustain this growing base of printers.

Several respondents reported that their business had grown without doing anything differently. When they elaborated, we learned that it was because a competitor had gone out of business. Respondents in the UK believe that both volumes and margins will be better in 2008 than they were in 2007, a result of efficiency gains and, in some cases, volumes gained from companies that have failed, or are expected to fail. Waiting for competitors to go under may not be the best business plan.

More respondents said they were raising prices then are cutting them, but most are not fully recovering all the increases in costs that they faced recently or are likely to face in the near future. Severe price cutting, either to win market share or to fill new capacity, continues.

Today, we are selling print for less than we did two decades ago and are passing most of the cost-cutting benefits on to the customer. One offset printer said that they are selling colour printing today for a little bit more than black-and-white printing back in 1990. They can do this because of new offset presses that provide makeready and speed advantages and other production advances.

For printing alone (putting ink on paper), the selling price today is equal to or about six per cent lower than it was in 1982, considering inflation and other factors. What has happened is known as “profit migration.” Printers have passed much of the savings in efficiency on to customers because of price competition.

As printers make less money from ink on paper they, of necessity, are adopting new revenue opportunities, primarily in digital printing, finishing, and fulfilment. Many printers have had to move to new value added services to find new profit potential.

Without cutting production cost, most printing companies would be at breakeven or less – neither of which is an acceptable condition.

Print is no longer growing at previous levels and we are seeing a contraction in the number of printers. Eventually there will be an equilibrium reached as the number of printers, print volume, and print buying expectations come into some sort of harmony. In the meantime, cost-cutting is a fact; value added services and pricing are a required philosophy.

4.1 Trends in service and support demand

Print providers depend on their equipment for production. As we have seen, print buyers are demanding tighter schedules. Thus, equipment operational reliability is essential for production.

TABLE 27 – Print provider digital printing equipment concerns

	North America	Western Europe	Asia	Rest of World	Average
System reliability	93.2%	94.3%	89.9%	94.1%	92.9%
Capability backup	89.4%	87.5%	81.1%	89.9%	87.0%
Finishing integration	72.1%	59.7%	49.7%	40.1%	55.4%
Workflow integration	81.3%	76.5%	47.6%	44.7%	62.5%
Consumables costs	84.2%	83.3%	87.9%	89.3%	86.2%
Other	60.4%	59.5%	57.8%	39.9%	54.4%
Average	80.1%	76.8%	69.0%	66.3%	73.1%

European print provider respondents’ responses included:

- 1 Operator-replaceable parts and staff maintenance (93.9 per cent).
- 2 Back-up printers that are the same in every manner except for some level of productivity (89.8 per cent). Example might be a system at one speed backed up by the same system at a different speed, instead of two different machines at two different speeds.
- 3 Remote diagnostics and remote problem resolution (92.4 per cent).
- 4 24/7 response levels for certain support areas (79.1 per cent).

Printing presses are considered to be more reliable than electronic systems, but this is based on the fact that printers take responsibility for much of the maintenance required. Because they can “fix” much of what occurs on a press, they see it as more reliable. Thus, the concept of operator-replaceable parts and self-maintenance resonate with them. The vast majority of printers appreciate remote diagnostics as well as system feedback to operation impediments and their cure.

Customer maintenance programs allow customers who have a desire to enhance the productivity and uptime of their digital printer by providing the training and tools to perform self-service and proactive maintenance. When asked, only 34.1 per cent of respondents would do all their own service.

TABLE 28 – Service perceptions

	North America	Western Europe	Asia	Rest of World	Average
Would do all own service	39.7%	41.9%	21.9%	32.9%	34.1%
Would do some of own service	60.3%	58.1%	78.1%	67.1%	65.9%
Supplier service adequate	81.8%	87.1%	59.9%	79.1%	77.0%
Supplier service inadequate	18.2%	12.9%	40.1%	20.9%	23.0%

4.2 The demands of digital printing from print buyers

Quality

Printers have long had a vision of “graphic arts quality” that has many definitions and many opinions. In 1951, an article in a British magazine said that offset lithography was “only good for quick and dirty printing.”

The interesting result of this survey was that print buyers found digital printing quality acceptable at a higher percentage than commercial printers – print buyers at 76 per cent and print producers at 67 per cent.

TABLE 29 – Digital printing quality perceptions

	North America	Western Europe	Asia	Rest of World	Total
Digital printing quality acceptable	64.3%	59.4%	74.0%	70.0%	66.9%
Digital printing quality unacceptable	29.2%	31.8%	20.0%	20.2%	25.3%
Digital print quality acceptable but limits	5.7%	7.9%	5.3%	8.7%	6.9%
No answer	0.8%	0.9%	0.7%	1.1%	0.9%
	100%	100%	100%	100%	100%

Except for reproducing a limited number of brand colours, digital printing quality is no longer an issue, according to the survey group. New digital colour printers have quality levels that print buyers find so close to offset as to be inconsequential.

A review of printing award recipients was instructive: 79.7 per cent of the winners had UV coating, foil stamping, embossing, or die cutting on the front or cover. Thus, our hypothesis is that finishing options may play a role in printer and buyer perceptions of quality (as well as value).

Respondents agreed that the best method for evaluating quality is to print a set of images and pages on digital printers being considered for acquisition. They stated that trying to compare numbers, such as resolution levels, bit depth, or other specifications was not as useful as comparing actual output.

Cost

Cost is what it takes to make something and price is what you can sell it for.

With printing, both cost and price have declined in recent years. The key to success in the printing industry has long been cost control. This has been accomplished through automation in the form of digital workflow, computer-to-plate, on-press platemaking, automated presses, digital printing, and highly efficient pre-press processes. An example of this is a visit we made to a printing company that had the first layoff in their long history. They installed a CTP system that negated the need for the film stripping department, as well as contact platemaking and its related personnel. It was somewhat eerie to pass by the glass-enclosed room housing a CTP system with virtually no one in the room. After re-training, re-assignment, and other approaches a small group of people were left without jobs. The company had no choice: they had to automate to compete and they had to compete to stay in business. Overnight, their workflow changed and some staff became redundant.

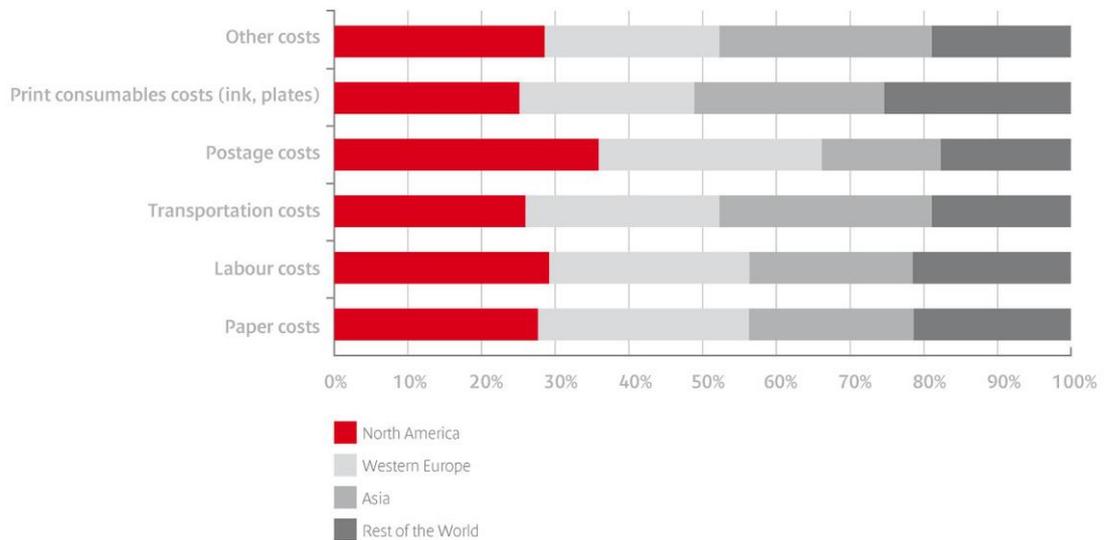
One of the largest printers in Europe has a pre-press department that applies PDF workflows and on-line customer proofs. They have integrated the customer into the process and utilised the Internet as a primary communications link. We noted the smallest press crews in history as press automation allowed control of sophisticated reproduction equipment by small numbers of operators.

The days of multiple echelons of press operators are gone. Printing automation is worldwide. We visited a book printer in Chennai, India whose oldest press was nine years old and the use of newer technology provided a productivity benefit. Printing firms work relentlessly to drive down costs.

But over and over, the feedback we received about cost increases was incessant.

TABLE 30 – Printing service cost concerns

Percentage of respondents who expected cost increases



A printer in Dubai told us that their paper costs were up 30 per cent. Their paper came from Europe. Competition and the continuing quest for lower prices by print buyers are squeezing most of the profit out of many jobs.

Printers cannot control their market or the pricing of their service, these are subject to competitive forces – but they can control cost. Increases in cost can be offset with increases in efficiency that reduce cost. For instance:

For instance:

1. Paper costs can be mitigated when several printers order in bulk from paper merchants. Peer groups are growing in number, composed of non-competitive printers in different locations.
2. Labour costs can be offset through increased automation. One operator, for instance, can manage multiple digital printers.
3. Transportation costs may be reduced by sending files to other printing firms for a distribute-and-print approach. Networks of printers are increasing and all share in the revenue.
4. Distribute-and-print approaches also work for postage savings by printing material closer to regional postal facilities.
5. Peer groups (groups of printers of similar capability) are also using their bulk buying power for consumables purchasing.

4.3 Colour accuracy

Colour quality is based on:

- Calibration – Adjustment of a device to conformance with specification
- Characterisation – Determining the colour gamut of a (calibrated) device
- Conversion – Transforming colour to optimise colour reproduction between one (calibrated, characterised) device and another
- Constant feedback – Monitoring colour test patches for real time adjustment

Digital printing quality can be more accurate than most offset presses because of continuing real-time feedback and adjustment. Test patterns may be printed and sensors read the patches. Calibration software monitors any shifts in colour and when an unacceptable hue shift is detected, the printer automatically resets itself to instantly produce the correct colour. This capability ensures that the colour is accurate from page-to-page.

Resolutions of 1200 dpi resolution equate to CTP and offset levels and are optimum for fine halftones, clean and precise lines and type, and smooth gradients and solids. New toners, some based on wax, have the ability to replicate gloss or matte paper

printing in the same manner as offset. New image transfer mechanisms mould the toner to the substrate. Gloss optimisation ensures that the gloss of the media will match the imaged area and micron-fine toners provide larger colour gamuts.

Some or all of these features are integrated into digital printers to produce accurate colour automatically. Thus, a digital printing proof for any job can be produced at any time, even in the middle of another job – it is essentially a run of one.

4.4 Media

Offset still holds the record for the widest array of substrates available for reproduction, although paper manufacturers are reducing the number of grades. In digital printing with particle-based toner, the substrate is an integral part of the process, requiring the holding or transference of an electrical charge. Over the last few years, paper and equipment manufacturers have collaborated to expand the range of substrates for digital printing substantially, from coated to non-coated, and light weight to heavy weight.

TABLE 31 – Media usage and trends, by volume

	North America	Western Europe	Asia	Rest of World	Average
Coated	56.10%	49.60%	32.60%	36.90%	43.80%
Uncoated	41.20%	40.10%	63.50%	61.80%	51.65%
Specialty	2.70%	10.30%	3.90%	1.30%	4.55%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Specialty media include plastics and label stocks. Digital printing substrate use is very similar.

The range of media available for digital printing did not seem to be an issue for the respondents.

TABLE 32 – Of all firms with digital printing, worldwide

	North America	Western Europe	Asia	Rest of World	Average
Range of media a major problem	12.9%	11.3%	3.7%	4.9%	8.2%
Range of media a minor problem	29.2%	25.1%	12.9%	14.8%	20.5%
Range of media not a problem	57.9%	63.6%	83.4%	80.3%	71.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

There was consensus that a smaller range of digital substrates was beneficial in terms of inventory. Respondents noted that paper suppliers now have similar stocks for offset and digital to allow hybrid printing.

4.5 Workflow

Workflow is a discrete set of tasks that form a process, or a combination of processes used to produce a product, or a network of activity to accomplish a task. Every printing job begins as an idea and eventually becomes a reality. Between those two points there are different steps taken by different people at different times in different places using different technology. One could say that it all adds up to a workflow, but that implies that all steps are involved in every job. There are certain definable macro operations, each one is made up of micro operations, and the end result of each macro operation becomes the input to the next macro operation.

Marketing workflows

It all begins when someone decides to use print and/or other media to promote a product or service, inform or educate an audience, or produce a product that will be sold. They go through processes that involve budgeting, media selection and channel decisions. The end result is a general idea of what is needed – a brochure, a flyer, an ad insert, a booklet, a postcard, etc. – that will work in conjunction with TV and Internet ads and other media. It usually begins because someone wants to sell something to someone else. The end result is a decision to move ahead on development of the material and the campaign.

Creative workflows

To translate the marketing goal into reality, graphic designers, writers, photographers, illustrators, and marketing people collaborate to bring the print product to life. It may begin as thumbnail sketches on the proverbial napkin or rough layouts done with a computer program. Designers once spent a lot of time doing comprehensives, which were simulations of the final product so that marketing and business decision makers could see how the final product would look. In the past, the creative workflow involved typesetters, colour separators, photostats, and paste-up mechanicals. Today, the designer has total control (and responsibility). Along the way they can output pre-proofs from digital printers of any kind for review and approval. The end result is a file that is ready for printing – delivered to the graphic arts service.

Business workflows

On the origination side, services may be selected through a bidding process, purchase orders must be issued, and specifications must be established. Coordination and contracting with warehousing, fulfilment centres, mailers, or other services may be necessary. Printing firms are integrating these services at present.

On the service side there is the need to plan the job, order paper and supplies, coordinate other services if needed, estimate the cost and price, and schedule the job. Job information is metadata and specifications as well as in-process production performance data. Business information may include production related data, and non-production information like sales reports and credit information, billing, accounting, and tax – plus supply chain stuff like ink, plates, and paper as well as chemistry and lubricants. All must be specified, purchased, inventoried, and managed. In most cases, all the material concerning a job is organised on a job ticket or folder, but some of the information is held on computers. The goal of many MIS systems is to integrate these two sets of processes.

Pre-press workflows

The service (printer or pre-press) preflights the file to find any problems. This is an essential step and they apply a number of tools to accomplish it. In strong contract relationships (the job is done on a regular basis) the file is probably a PDF. In other cases, it may be a folder with the application program, fonts, images, and a report. The first result of this process is a proof for the customer to sign off, the so-called contract proof. There could be multiple iterations in this workflow as the customer makes changes. The service may produce a pagination proof so the customer can verify folios and spreads. After approval, the final file is ready for CTP or digital printing.

Printing workflows

The plates, paper, ink, etc. are delivered to the press and makeready begins. The proof is used as the reference point. Depending on the press, sheets may be run once on a perfecter or twice (with a lag for drying). The end result of sheet-fed printing is a skid or stack of printed sheets. The end result of web printing is usually a folded signature. For digital printing, a file is sent to the front end, stored, assigned a paper tray, and set up for various operations. The use of pre-press data to establish litho ink settings was the first electronically-enabled linking of the prepress, platemaking, and press islands of automation.

Finishing workflows

The printed sheets are delivered to the bindery and cut, folded, bound, packed, and delivered to the loading dock or mailing area. If the signatures come off a web press, they are ready for binding because they are already folded. Sheet-fed sheets must be folded first unless the final products must be cut out of the sheet and then delivered flat, or cut and then folded (like simple 4-page brochures). The finishing system could also be integrated with the digital printer. This is most common when there is a high volume of work that requires similar binding. 67 per cent of digital printers do not use online binding; however, 97.8 per cent of respondents would implement online finishing if their workload warranted it.

Distribution workflows

The finished products are processed for mailing in-house, or trucked to a mailing service or fulfilment service. In periodical, catalogue, and direct mail printing, the addressing is done at the end of the bindery line. With personalised direct mail, the digital printer produces all pieces ready to be mailed. If an outside mailer is used, they would do the addressing on a mail table. The mailed pieces must then be delivered to the post office with the required paperwork and payment. Some products may be delivered to customer offices or warehouses for other services.

Billing/Archiving workflows

The job folder is sent to the billing department to check for operations that were performed above and beyond the order. This information may have been collected electronically as each person or operation that touched the job reported back to the MIS system. The invoice must reflect the original estimate plus changes and extra operations. Additionally, the ripped files may be archived so that reprints can be run without re-processing.

Notice that some of these workflows above exist irrespective of the printing process and that most workflow automation results from the elimination or integration of steps. All workflows may be proprietary to some extent. Print is truly a workflow of workflows.

There can be two distinct workflows in a commercial print shop – one for offset and, when offered, one for digital, although the trend is to offer both services. There is high anticipation for converged digital/offset workflows. Industry experts feel this “merged process” will become crucial over the next decade. A major key to the adoption of this approach is the job definition format or JDF. JDF enables real-time integration between business systems and production processes. It assists printers in reducing waste

and maximising production while limiting errors in production and administration. Just as PostScript provided a standard that improved industry productivity, JDF carries the same potential.

Worldwide, 79.7 per cent of users of both offset and digital printing would implement a converged workflow. European printers are using the Internet and e-commerce, adopting digital workflows, CIP3 and CIP4, various file formats such as PDF and XML, and JDF.

4.6 Business development support demands and trends

Printing services appreciate digital printing suppliers who provide business building tools to help printers develop “go-to-market” strategies and help them become value added solutions providers:

Self-assessment tools – Enables print service providers to identify strengths and weaknesses and address any weaknesses that may exist in their business and develop.

Application tools – Marketing tools that cover vertical markets.

Sales strategy tools – Customer engagement approaches with solutions that add measurable improvements to the printed page, and incorporate application solutions ranging from simple static jobs to complex cross-media campaigns.

Mentoring – Access to business development experts who specialise in business planning, marketing, production and workflow.

Workflow solutions tools – Designed to assist customers in maximising workflow efficiencies in:

- Document management
- Scan management
- Publishing management
- Remote diagnostics
- Remote network/device management
- Service automation
- Data capture and conversion
- Forms management
- Document distribution
- Digital rights management
- Security management

Security management software provides tracking and accountability data for information sent to and from devices. This application is ideal for government, legal, finance and education practices, as well as any business that handles sensitive information. Today, companies and organisations are obligated to protect important information such as customer records, intellectual capital, financial documentation, and more. The information security market has many solutions for soft information distribution like e-mail filtering and http filtering/monitoring.

Data capture and conversion services include capturing legacy paper-based information and converting it into electronic data. These services are provided at the customer location or offsite and are ideal in aiding customers in integrating legacy paper-based information into document management systems. Some printing companies now provide this service, including metadata encoding.

Worldwide, 87 per cent of the print provider respondents look to their suppliers for either direction of support in business development. Just as offset press and peripheral suppliers provided materials, education, and support as offset entered the industry, so digital printing suppliers are also supporting their customers with samples, marketing information, and, especially, new ideas.

Equipment suppliers no longer sell equipment only – they sell solutions. In many cases, they partner with other suppliers to offer combinations of software and systems that provide new functions that integrate with digital printing. These include:

1. Cross-channel marketing

The success of creating mail pieces that ask recipients to log on to their own personalised URL landing page is driving cross-channel approaches.

2. Marketing intelligence through captured click paths

The backend data collected from mail recipients who log on to their own personal website is invaluable. Detailed accounts of which client was clicking, and what they were clicking on were displayed within these Websites.

3. Marketing automation for a sales force

Mail recipients enter their contact data and clients can download these files and integrate this data with their internal CRM or less formal contact management systems. The relevant sales representative then receives a lead report. A relevant communication placed in a timely manner can reach prospects with the right message at the right time and all this can also save thousands of dollars in marketing costs.

4. Sales and marketing accountability

Cross-channel campaign performance is measurable – a gauge on the quality and quantity of leads produced for the sales force by marketing. The ability to track response rates, measure return on investment, and download data allows organisations to effectively match their sales efforts with prospects interested in more communication.

4.7 Hybrid workflow demands and trends

Hybrid workflows have two approaches:

- 1 The use of static-printed material by offset (or other processes) combined with dynamic-printed material by toner (or inkjet).
- 2 The use of systems that combine offset and digital printing in one print run.

A desired strategy in commercial printing is to combine offset and digital printing in one workflow to increase efficiency. This approach requires the integration of two distinct and different sub-workflows. Moving print jobs between toner-based and ink-based equipment calls for cross-platform continuity and converging ICC colour management systems, paper profiles, etc. Respondents believe that print providers and software/hardware manufacturers will combine many parts of traditional and digital print workflows.

The advent of new colour printers will negate the need for pre-printed paper and it will drop from 63 per cent of all page impressions in 2000 to 31 per cent in 2020.

TABLE 33 – Hybrid printing of transaction documents, worldwide

Based on page impressions	2000	2010	2020
Blank paper	37.0%	42.0%	69.0%
Pre-printed paper	63.0%	58.0%	31.0%
	100%	100%	100%

The reason for pre-printed stock and direct mail shells is that offset printed long runs are less expensive than toner-based long runs. Thus, imprinting a smaller area of the document uses less toner. However, new digital printers bring the cost of printing colour to a level that is now justifiable for printing the entire area.



THE INSIGHT REPORT

business practices

5

Business Practices

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E-solutions: printers and the Internet

In Europe e-commerce or e-solutions are growing among printers, with some developing their own solution and others acquiring a system from their equipment supplier or supplier partner.

5.1 E-solution functions

- Job bidding
- Obtain 1-to-1 marketing program services
- Specify print jobs via online job ticket
- Order static print from catalogue
- Order reprints from a list
- Manage remote document repository
- Customise or personalise print from catalogue
- Request print job quote via an online RFQ system
- Submit print job files via online job ticket
- Obtain online creation/composition services
- Collaborate with vendors & other contributors
- Proof job on screen
- Obtain info on print spending, access reports
- Consult database to select the right supplier
- Track job status
- Research potential suppliers

In Europe, print buying respondents report that their company is using e-solutions for the procurement of print. Over 90 per cent of these companies have been using an e-solution for a year or more. 79 per cent of print buyers use e-mail to either initiate a procurement request, secure internal approval, issue RFQs, and submit bids/tenders to vendors, in addition to general communication. This percentage will exceed 90 per cent by 2015.

There are several facets to the application of the Internet to the business of printing. Once again, terms are used synonymously, but there are differences.

1. File transfer

This can be as simple as e-mail or as sophisticated as an ftp site. Ftp allows file transfers directly to printer provider servers. Using Fetch or drop folder approaches, more files are now being delivered in this manner than any other. Print buyers report that 89.9 per cent of their files are now delivered electronically and printers report that 88.9 per cent of their files are now received electronically.

2. Print provider websites

These are usually informational websites with equipment lists, FAQs (Frequently Asked Questions), colour profiles, PDF add-ins, printing glossaries and tips, and contact information. A website is practically a must for print providers.

3. E-procurement

Print e-procurement is the process by which buyers electronically source, price, procure, and possibly pay for printed materials. Buyers may be the general public, professional purchasing agents, or people responsible for creating the item to be printed. These tools offer buyers the ability to streamline the order process, reduce production errors, and cut costs.

E-procurement tools enable project management, including the solicitation and evaluation of bids from multiple suppliers, facilitation of direct mail campaigns, and integration with back office functions such as accounts payable. E-procurement applications can be implemented and managed by a buying company to facilitate ordering from multiple suppliers and/or from an internal print shop.

E-procurement systems belong to print buying organisations where W2P (web-to-print) systems belong to print providers. The terms “digital storefront” and “e-storefront” are also used for various level of e-solutions. Another differentiator may be that an e-procurement system lets the buyer buy a service, where W2P lets the buyer buy a product.

4. Web-To-Print (W2P)

W2P solutions are Web-based applications that enable buyers to select items they wish to purchase from a pre-defined list; upload files; determine the quantity and other specifications; view pricing, and pay with a credit card. While typical business materials such as stationery products, brochures, and newsletters are commonly purchased, more complex items, such as direct mail components and marketing collateral may be supported.

Wedding invitations, birth announcements, christening invitations, party invitations, menu cards, thank you cards, postcards, business cards, letterheads, brochures, flyers, folders and envelopes are only a few of the print items available for online procurement.

In Europe, 54 per cent of both buyer and producer respondents noted fewer errors in order submission when e-solutions were used, and many said that the solution exceeded or far exceeded their expectations.

Much of the above is categorised under the general term Web-to-print. Web-to-print is really a misnomer. Based on a robust feature set, these systems have differing levels of functionality and are enabling broader multi-channel Web services.

5.2 The dotcom boom and bust

The promise of print e-procurement surfaced during the dotcom era of the late 1990s. Exaggerated beyond reality and spurned by print service providers, print e-procurement developers spent tremendous amounts with modest results at the time. Paper and personal contact have formed the basis of print purchasing for generations. Even today, companies that do not use an e-solution almost exclusively use e-mail for all stages of the procurement process. The general thinking about Internet-enabled printing services revolves around a storefront concept with functionality that includes job ordering, job submission, job tracking, and collaboration among various parties in the value chain. E-business services have matured and further expanded into full-function job ordering and specification, job tracking, customisable storefronts, document and template customisation with variable data capability, multi-channel campaign management, digital asset management, inventory control, and integration with production workflow to streamline operational efficiency.

Only 11 per cent of print buying companies still use paper-based processes at different stages of print procurement. E-solutions offer benefits over traditional paper and e-mail-based processes: 39 per cent of European respondents report cost savings ranging from 10 to 25 per cent.

Among the small-to-medium print buyers currently using an e-solution, two-thirds use it for more than 80 per cent of their print procurement. Nearly one half (49.1 per cent) use their e-procurement solution to purchase 95 per cent or more of their printed materials.

52 per cent of the print buyers have a centralised procurement process, with an additional 22 per cent indicating that procurement is mostly centralised with some specialty procurements handled by different departments. There is a greater tendency to centralise procurement, with some specialty purchases handled by a different department. Interestingly, 49.2 per cent of print buyers have some jobs purchased by the design service, bypassing the company's purchasing department.

Savings are generated due to

- 1 The increased competition that e-solution tools foster (it is easier to request more quotes and to evaluate additional suppliers)
- 2 Higher product quality (new suppliers; alternative production processes)
- 3 Less waste (more detailed and accurate specifications)

Most of the e-solution cost savings derive from price reductions and a relatively small amount is derived from improvements in the procurement process. Print service providers should view the use of an e-procurement and W2P solution as the means not only to provide unique products and service, but also to become an intimate part of their customers' procurement process and truly partner with customers.

Half of all print service providers worldwide are offering these services, with another third intending to offer them within the next 24 months. In 2000, only five per cent of respondents reported having an e-solution.

5.3 New revenue streams

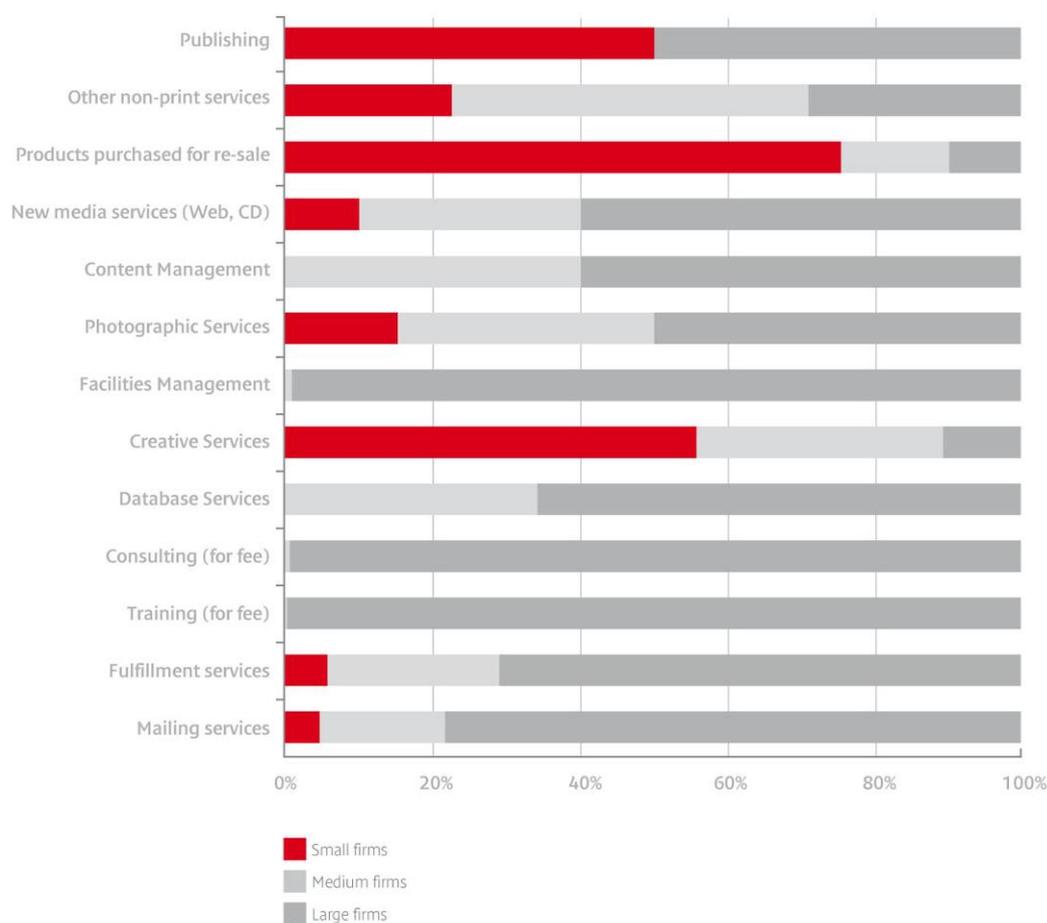
TABLE 34 – Where do you expect to derive revenue in digital printing?

	North America	Western Europe	Asia	Rest of World	Average
Photo books	88.2%	91.3%	89.9%	79.3%	87.2%
Short run advertising collateral	89.2%	91.3%	79.9%	79.3%	84.9%
Versioned promotions	79.4%	77.5%	71.8%	69.9%	74.7%
Short run publications (e.g. newsletters)	67.3%	71.5%	67.6%	54.7%	65.3%
One-off books	61.3%	66.5%	57.6%	54.7%	60.0%
Targeted direct mail	80.1%	79.7%	19.7%	30.1%	52.4%
Other photo merchandise	50.4%	47.5%	57.8%	45.9%	50.4%
Posters, signage	39.1%	49.7%	54.7%	36.1%	44.9%
Other	21.3%	23.5%	17.6%	24.7%	21.8%

Short-run advertising collateral and photo books were the first two digital opportunities mentioned.

5.4 Value added services

TABLE 35 – “Ancillary” services provided by printing per cent of firms, worldwide



Most of these services are value add because they are considered to be complex and difficult. Thus, they have not been commoditised because of price competition.

For instance, printers offering database services list that service as a line item on their invoice, right after or before the printing charge. This could appear as though the value add database service was somehow similar to the commoditised print service. Printers must learn how to present value added services in a manner that indicates their complexity and thus their higher price.

5.5 The sales consultant

There are two aspects to this area:

- 1 The support from digital printing suppliers for their customers
- 2 The new breed of print provider sales professional

Digital printing suppliers, to a lesser or greater degree, provide marketing materials that support their customers' sales. They have websites and other information to inform users of market segments, sales potential, marketing tips, samples, and other data that is useful to the print provider in their marketing.

In addition, successful print providers have trained their sales force to sell digital printing by applying more focused methods to approach upper levels of management with new ideas about cross channel and multi-media marketing. It is more and more common to find print providers employing a separate sales force that is more focused on digital and variable data printing.

There are 40 major markets for printing:

- Ad Agency
- Architecture/Engineering
- Associations
- Automotive
- Banks
- Beverages
- Book Publishing
- Casino/Gambling
- Catalogue & Mail Order
- Cruise
- Department Stores
- Fashion and Apparel
- Franchise Ops (channel sales)
- Fundraising
- Gas & Electric
- Government (National)
- Government (Local)
- Greeting Cards
- Health Care
- High Tech
- Higher Education
- Hotel (Hospitality)
- Insurance
- Investment (Mutual Funds)
- Manufacturing
- Miscellaneous
- Newspapers
- Office Supply /Home Improvement
- Packaged Food
- Pharmaceutical
- Photographers
- Professional Services
- Publishing
- Real Estate
- Retail Food/Supermarket/Grocery
- Schools K-12
- Sports/Entertainment
- Telecommunications
- Toys and Games
- Travel
- Wholesale Food

Each is unique in the types of print material produced and the workflows applied.

All can benefit from VDP but there are a few that are hot:

- Casinos track every aspect of guest's visit. They can usually record wagering time, type, and volume, restaurant activity, gift shop purchases, and the use of any other services. This information can be used to generate personalised coupons that relate to the particular guest's preferences.
- Healthcare organisations can personalise communications based on age, medical condition, or location. Newsletters and advisories can be specific to the individual.
- Higher education can apply VDP in admissions, alumni relations, and development/fundraising. For admissions, images on brochures can be specific to the potential student's interests as indicated on a form. Alumni relations can use information and imagery based on the alumnus' date of graduation and degree. Fundraising can tailor requests in many ways.
- Financial services such as insurance companies, banks, and mutual funds are in competition for investments. Imagery on brochures can be selected based on the recipient's age or gender or family makeup.
- Retail food/Supermarket loyalty customers leave a trail as to the timing and nature of their purchases. Newsletters or other promotions can provide coupons based on past purchases or coupons designed to get you to change brands.

Some digital printing suppliers provide in-depth materials on market segments so as to help printers reach and sell these markets.

Printing services have discovered the challenges of using a traditional sales force to sell digital printing and related services. Many firms now have separate sales forces that focus on marketing, target marketing, and other products specific to digital printing. In addition to being sales representatives, they are becoming consultants that can work with client marketing departments to develop effective campaigns.

5.6 Legacy marketing

Legacy marketing is based on old ideas and old thinking. It is the brochure-in-an-envelope solution. Printers sell such printing to legacy marketers for less than they did ten years ago. Current creative support staffs can get stock photos and boilerplate copy into this format quickly.

This is why print providers must employ sales consultants who can work with client communication and marketing departments.

Traditionally, the advertising business is based on “The Big Idea” and “Branding” programs and the static brochure is the foundation. A common mailing piece is composed of a two-colour letter with a full-colour flyer or brochure placed into an envelope in runs of 10,000 (down from 50,000), and the average response has dropped from the half of one per cent to less than 1/10th of 1 per cent. As response rates drop, one would think that clients would be clamouring for anything that improves their marketing.

Marketing is the planning, execution, pricing, and promotion of ideas, goods, and services. For most printers, the traditional job has been to assist in the promotion aspect by producing paper-based communications.

Some digital printing and certainly the majority of variable data printing requires involvement at the planning stages of clients’ marketing programs. A successful digital printer needs to become part of their client’s marketing team and actually participate in strategy and planning meetings. Once they determine the problems and/or goals, they can then offer imaginative solutions based on their knowledge, experience, and capabilities. We call this new breed of print provider a Marketing Services Provider or a Digital Marketing Service.

This type of service prints, but also provides design, database management, and cross-media campaigns including e-mail and the Internet, mailing and fulfilment, and more. Printers who enter the digital print arena are now developing a separate sales organisation to sell these marketing services. Many printers have dropped the terms “printing,” “litho,” “press,” etc. from their company names. Being able to offer these value added services avoids commodity pricing and allows the printer to become a consultant or marketing partner to their client.

Savvy marketers are increasing the use of targeting techniques, selective distribution, emphasis on customer retention, and personalised communications. Direct mail is the only content distribution channel – other forms of print, alternative electronic media, or otherwise – that can reach every household in a nation if desired, or that can be highly selective to an audience of one or of any size, located anywhere, segregated into defined marketing target groups. This unique distribution capability keeps direct marketing in the forefront of advertising communications growth.

Forty-three per cent of respondents indicated a move towards expanding into new vertical print markets.

Fifty-four per cent of the respondents indicated that they will move towards becoming a business communications service provider. This represents a fundamental strategic change and an important trend towards specialisation – ten per cent of the respondents indicated future plans to add a range of non-print services including facilities management, IT functions, design, mailing, and fulfilment, among others.

5.7 The re-birth of the small printer

The 1960s and 1970s saw the largest number of printing startups worldwide – because offset duplicator presses and their accompanying equipment were less expensive than prevailing hot metal/letterpress devices. Many large printing firms today trace their lineage back to a patriarch (or matriarch) with a used AB Dick or AM Multilith in the basement or garage.

The same thing is happening today. We are seeing the rise of digital-only print services by a new generation of entrepreneurs. Some are new services or spin-offs from existing businesses, and some are evolved from copy, photo, and sign shops.

A snapshot of the New Zealand printing industry is illustrative. There was an increase in the number of print establishments – 254 in 2006 to 335 in 2007. In actuality, mergers have been taking place regularly and the number of larger printing firms is down.

But the New Zealand trade association re-defined the industry and included all firms involved with reproduction – thus sign shops and copy shops were counted. Industry revenue rose from \$1.1 Billion (NZ) to \$1.25 Billion (NZ) – a nine per cent increase – confirming that the increase included small firms. What was most interesting is that digital printing rose 44 per cent among all users, mostly because of the smaller users.

This phenomenon is being replicated across the globe. Call them copy shops or stationery printers or quick printers or small commercial printers or sign shops or even online print services. They have two aspects in common:

- They are small (less than 20 employees).
- They are totally digital.

Small businesses dominate the printing industry, as is the case for Australian industry with 85 per cent of printing enterprises employing fewer than 20 people. This predominance of small businesses is a worldwide feature of the industry. For example, almost three-quarters of print shops in Germany employ fewer than ten staff. In Asia, 95 per cent of companies are classified as small businesses.

Thus, 89 per cent of the world's printers are under 20 employees. Over 98 per cent are independent businesses – with only a small fraction franchised (the most common perception of the small printer) or part of a larger company.

We are seeing both decline and growth in the printing industry simultaneously. Medium and large printers are consolidating, thus reducing the overall number of firms. But, at the same time, re-definition would include more existing firms and the new firms that are starting up. Thus, the number of “printers” in the world is higher than reported, if one accepts the digital-only printer as a printer.

Because digital printing is scalable – from low-end systems at ten pages per minute to seventy pages per minute or more – one can start small and increase in capability as required. More importantly, most of the skillsets of the traditional printing industry are now automated to a high degree. It takes less labour and less skill to produce a printed page than at any time in history because much of the skill is built into the digital printer.

Why hasn't this phenomenon been articulated before? Because small shops are difficult to find and track, and traditional trade associations may restrict membership to firms that are larger or use certain technologies, like offset. In the 1930s printing associations were comprised of letterpress printers and would not allow membership of offset printers. Thus, offset printers formed their own associations. Copy shops are not usually considered printing services; yet, they apply many of the same digital printing systems as quick and commercial printers. Sign shops were not covered by traditional industry associations; yet, they now apply wide format digital printing routinely, and are acquiring page-oriented digital printers. Lastly, photographic services produced prints with chemically-developed film; but now these firms are applying digital printing and moving beyond the print to the document.

There are two aspects that define a printing service:

1. Some level of quantity is produced, which would eliminate home and occasional copying/printing.
2. Print is a paid service.

The “print-for-pay” requirement has excluded in-plant (not-for-pay) operations, even though some of them “sell” their printing production to departments within their company through a chargeback system. In Europe many operate to save VAT.

Newspapers own offset presses, but usually only print for themselves. However, some of them provide commercial printing services. When they print for themselves, they record all print manufacturing costs. Those costs should be represented in the revenue base for the printing industry.

Pre-press businesses (repro houses) now have digital printers for short-run jobs. Do we count the entire firm or only that portion devoted to print? We have always counted pre-press revenue in printing company results, why wouldn't we count pre-press and printing revenue in pre-press company results?

We contend that any entity, individual, or company, that produces reproduced material in quantity and charges for it in any manner should be considered in the demographics of the printing industry.

The installed base of reproduction equipment will change over the next decade, as it did from 1960 to 1980 when offset replaced letterpress and phototypesetting replaced hot metal type. To exclude segments of the equipment population skews all projections. Copiers have been replaced by digital printers. Digital printers have replaced offset presses, just as offset presses replaced letterpress presses.

5.8 Copying services

Copy shops do not own printing presses. Their services include blueprinting, business services, copying, document duplicating, photocopying, wide format printing, and reprographic services. Copy shops and business services that produce volume reproduction services should be counted, but “occasional” or “walk-up” copier locations should not be included because they usually are not producing “quantity.”

The digital duplicator (high-speed copier) in the early 1990s had a profound effect on both the copying market and the offset duplicator market. Within only a few years, digital printing replaced certain classes of copiers and low-end offset presses. The first users of digital printing were desktop service bureaus; the first users of digital colour printing were pre-press services. We also must consider office supply retailers such as Staples, Office Depot, OfficeMax and their like, all of whom have expanded in-store reproduction services with digital-only equipment.

The copier and digital printer worlds are merging. All new copiers are digital printers with scanners, or MFPs. This makes the device multi-functional in that it can accept either hard copy pages or digital files. Today, for some products, digital printing is a substitute for offset lithography just as offset litho was a substitute for letterpress. Firms that only have digital printing will upgrade their equipment, just as small printers with offset duplicators upgraded to bigger and faster offset presses.

What is the difference between a small printer, copy shop, and a quick printer?

“Small printer” can mean the firm has a reproduction device (duplicator) that is 2-up or less. Press size has traditionally been an indicator of a firm’s capability which is why many printers define themselves by their press. One very large commercial printer claimed that they were a quick printer even though they had almost 500 employees, but with many small presses. There is an overlap of 50 per cent or better between each segment as shown below:

	Copy Shop	Quick Printer	Commercial Printer
Copying services	Yes	Yes	No
Design services	No	Yes	Some
Digital printing	Yes	Yes	Yes
Small offset litho	No	Yes	Yes
Large offset litho	No	Some	Yes
Bindery services	Some	Yes	Yes
Mailing services	Some	Some	Yes
Wide format print	Yes	Yes	Some

The term “instant printer” or “quick printer” arose in the 1960s as the camera-platemaker and the offset duplicator allowed printers to offer while-you-wait services. These firms evolved into black-and-white and colour copying as well and split into two markets: franchise and independent companies. In some parts of Europe, handset type and letterpress printing were considered “quick” printing processes. We tend to think of quick printers as relying on walk-in customers for the bulk of their business. As part of their changing business strategy, they are pursuing corporate business instead of waiting for the customer to walk through the door. Quick printers aren’t necessarily quick – their typical turnaround for jobs is longer than 24 hours.

Quick printers are now involved with pick-and-pack, kitting, fulfilment, mailing, and other post-printing services. Corporate customers are also ordering posters, trade show exhibits and other point-of-purchase products. They need fast turnaround and usually provide the digital file.

Quick printers are usually considered to be franchises. The franchise segment of the quick printing industry continues to contract. FedEx Kinkos is not a franchise, but its local stores are copy shops or quick printers. Quick printing is short-run, quick-turnaround commercial printing and copying. Offset printing accounts for only 22 per cent of all sales, and copying/digital printing makes up the balance.

We also find that the definition of small depends on many factors. A €5 million printing firm has been described as small, as have €10 million firms. We tend to use €2 million as the definition of small, which translates into less than 20 employees.

The single most important trend among all printers is the adoption of digital printing in all its iterations.

TABLE 36 – Of all printing firms, worldwide

	North America	Western Europe	Asia	Rest of World	Average
Copiers only	11.9%	12.7%	17.2%	13.8%	13.9%
Digital page printers only	34.8%	25.1%	12.9%	19.5%	23.1%
Digital wide format printers only	29.9%	30.1%	12.9%	13.2%	21.5%
Both wide format and page digital printers	18.5%	18.9%	12.1%	18.9%	17.1%
	27.7%	24.7%	12.6%	17.2%	20.6%

The line is blurring between copy shop, photo house, sign shop, quick printer, and commercial printer – as well as sign shop and photo shop – and that present definitions are less and less helpful.

The digital print specialist is a company that specialises in digital printing, usually maintaining a fleet of machines ranging from black-and-white to full colour with a range of on-line and/or near-line finishing and binding capabilities, both page and wide format oriented.

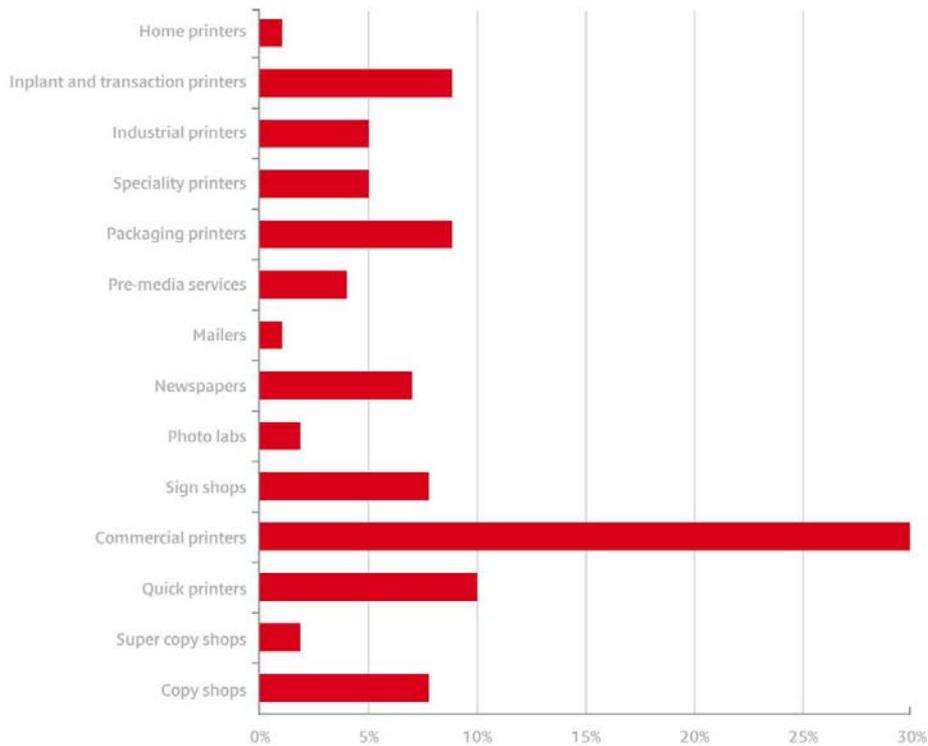
5.9 The bottom line

We are seeing the growth of smaller shops that enter the market with digital printing only. These are mostly small shops and they are everywhere. In Vietnam, there are only 1,000 printers but thousands of “photocopy” and photo finishing shops. Many were using digital printing.

If we re-counted industry firms under these definitions, we would see that we are actually growing in number of establishments, even as there is a decline in currently-defined printers. Even the North American NAICS and the EU NACE systems segregate copy shops and sign shops as well as quick printers. A small printer is a small printer. And the commercial user of a digital printer is a printer.

Thus, we must look at the entire industry and every category of print producer. Over time, there will be shifts in volume levels and work types, as sign shops produce pages and copy shops produce signs.

TABLE 37 – Where will print be produced?



We think that there will be a growth in small digital printing businesses on a worldwide basis as copy shops upgrade, photo shops expand, and sign shops extend their offerings. And some of these firms will grow and become the next generation of medium and large printing services.



THE INSIGHT REPORT

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The road to the future

6 | The road to the future

In 1985 we organised the first conference about on-demand printing. Today, that concept is applied in many ways all over the world. If you order a book from amazon and it says it will take five days or more, that book is being printed for you on-demand. Digital camera users upload photos every day to Websites that produce photo books and merchandise.

That 1985 conference was inspired by the first digital printing systems, which we saw as the convergence of the typesetting machine and the printing press. It took 20 years for the concept to become a mainstream production approach. In 1988 we acquired one of the first colour copiers and built a business, but that business truly grew when we attached the first RIP to the system and had one of the first digital colour printers. Its quality was a shadow of graphic arts quality but we found markets that would pay for short runs of colour documents. Within the next 20 years digital colour printers increased in speed, capability, and quality and they are now in mainstream production.

Our point is that time and technology change and there are people who create businesses that will make the most of both.

6.1 A plan for action

Understand why a personalised page or project is worth more

Targeted promotion produces more responses, more sales, and retains more customers. It does more; it is worth more; it should sell for more.

Maximise 'value added' products and services

Stop selling impressions and sell products and services that provide results for customers. We are no longer printers; we are print communication services.

Become a database expert

Data is power. Look at the data before you design the offer. The best campaigns start when a marketer looks first at a database and asks "What do I know about them?" Look beyond the mailing information for the real value of a database.

Become a digital marketer

Become an extension of your client's marketing. Bypass the bidding process by offering a range of related services in one project. Print buyers no longer buy only print; they buy marketing campaigns.

Train, train, train

Invest in your staff and they will grow the business. Every printer claims great quality and service, so differentiation must involve the value add that only people can create.

Market, don't sell

Learn your prospect's business. Bring them ideas and samples. Excite their imagination. Do not compete for jobs, help to create the jobs.

Become super efficient

It's not your father's printing industry. Waste in the bindery means someone will not get that great offer. Have a plan and a workflow for re-dos. Drive every Euro of cost and waste out of the system.

Upgrade

Keep your system current. Users and suppliers must partner to evolve cost-efficient updates, revisions, and add-ons.

Combine print and electronic solutions

Purls and Websites and e-mail blasts are now part of marketing programs. Become Internet-centric in every aspect of your business.

Innovate

There are many new ideas that can benefit your business. Seek them out and try them out. It only takes one great idea to make a difference.

Integrate

Find the right blend of equipment and systems and then integrate them all into an automated workflow.

6.2 Other Sources

Competitiveness of the European Graphic Industry - Prospects for the EU printing sector to respond to its structural and technological challenges, Ernst & Young for the European Commission, 2007

Why work with the European printing industry, Intergraf, 2007

Wood, paper and printing – Forestry-based and Related Industries in the EU, European Commission, 2006

PIRA reports

The Future of Global Markets for Digital Printing to 2018

The Future of Digital Printing for Packaging

Distributed at Drupa | 2008

This report was commissioned by Canon Europe for the benefit of the European printing industry and others involved in print. Canon Europe had no role in the research or results in any manner. The research team thanks them for their vision and support.

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