Printers and Print Management Agencies: Their Current Challenges

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This paper reports upon a small interview-based survey of printers and print management agencies carried out in Europe in the autumn of 2000. The interviews focused upon printers and print management agencies who deal mostly with medium size enterprises, and national and multi-national corporations, whose print requirements are for the most part characterised by complexity and the uniqueness of each print project. The main foci of the interviews were the print industry's current business and technology environments, changes in these environments and their effects upon their business.

Summary

This paper reports upon an interview based survey of printers and print management agencies carried out in the autumn of 2000. The interviews focused upon printers and print management agencies who deal mostly with medium size enterprises, and national and multi-national corporations, whose print requirements are for the most part characterised by complexity and the uniqueness of each print project. The main foci of the interviews were the print industry's current business and technology environments, and changes in these environments and their effects.

Numbers in brackets refer to sections in the main report.

The worldwide print industry is currently undergoing many changes, shaped by changes in its business and technical environments (2.2). The most significant changes include: the effects of digital communication, workflow and printing technologies; changes in the way print requirements are managed; and changes in what is printed.

As many large corporations look to reduce their operating expenses, they are outsourcing non-key functions (2.4). The management of print buying is one such function, and such enterprises no longer employ people with print buying expertise (2.5). Buying print is a complex and skilled task, and typically, outsourcing companies develop partnerships with specialist print management agencies who manage their print requirements. An important part of the agency's rôle is to create and manage a network of suppliers who contribute towards fulfilment of print projects. The network will consist of different sorts of vetted and benchmarked suppliers (printers, translators, distributors) and will operate competitively. Other print buying organisations however, deal directly with printers, who also have networks of suppliers with whom they work. This does not mean that these organisations employ skilled print buyers: in general print buying is a subsidiary function, seldom a job or career in itself.

Many print management agencies and printers specialise in different market sectors as a way of adding value to their service offerings (2.7). Their knowledge of a market sector (e.g. blue chip industries, publishers, mass mailing) means they can develop processes and services of value specifically to that sector.

The print marketplace is extremely competitive because there is currently over-capacity in the print marketplace (2.2). Printers cannot compete on quality, speed and cost of service alone, so many are developing extra services to achieve distinctiveness (2.8). Some new services exploit newer digital technologies (personalised web pages, variable data printing); others are moving into new service offerings (managing customers' inventory and distribution of their printed materials). In this latter respect, printers are beginning to compete with the service offered by print management agencies.

As more companies focus on their core businesses and outsource the management of their printing requirements, many are asking print management agencies and printers to widen their skills base. In some cases, customers are asking for more consultancy from print management agencies: to help them with marketing campaigns, not just managing their print requirements (2.9). Some want print management agencies or printers to manage their inventories of printed material or the distribution of it. It is also the case that both print management agencies and printers are acting as IT consultants for their customers (2.10). They are informing their customers of new technologies which improve workflow efficiency (e.g. PDF files) and in some cases installing and maintaining the software for them. One of the consequences of this is that there are ambiguities of responsibility when the customer is not satisfied with the printed product.

Formerly, the printer has cleaned up customer errors in pre-press activities; when customers do much of the pre-press work themselves, it is less clear who has ultimate responsibility.

In this sector of the print marketplace, where printed products are characterised by high quality and complexity, relationships between organisations are still important (3). Suppliers are able to provide a more effective service through knowledge and experience of the customer and of partner suppliers, and customers can have more confidence in suppliers whose quality and worth has previously been established. Print buying organisations trust their print management agencies to maintain networks of suppliers who deliver price effective, high quality and reliable outcomes. With large marketing budgets being more focused upon single campaigns of higher unit cost, more depends on the process and outcome of print projects running efficiently and effectively (2.6). To a significant degree, these good outcomes depend upon the skill and judgment of individuals who use the knowledge they have built up of customer and partner organisations (3.2).

The high capital costs of printing presses mean that for printers to make returns on their investments they have to be run 67 days a week; 24 hours a day (2.2). Their schedules are therefore very tightly organised; however, they are subject to constant change (4.1). Much of this change comes from their customers: problems in the content of what's being printed, a fair amount of which is unpredictable. It becomes the printer's problem to manage the change to their schedules in such a way that still optimises the use of their presses while delivering all customers' print by their deadlines. Printers' schedules and changes to them are usually managed manually because of the high degree of complexity and tacit, informal knowledge involved. Sometimes they will have to make compromises, such as running a two colour job on a four colour press, which is uneconomic, or outsourcing the printing to a trusted fellow printer. Changing schedules are no less a problem for print management agencies to manage (4.2).

Digital printing is fairly limited at the moment and the opportunities for capitalising upon its capabilities are also restricted (5.1). There has been a great uptake amongst print buying organisations of digital technologies in the last 12-18 months, although there is also great variability of technical sophistication amongst them (6.) Fully digital workflow between enabled customers and their suppliers is held up by colour, and the absence of standards to ensure digital colour fidelity between different devices and systems. Proofing in this market sector is therefore still done using traditional materials, and this is both slow and expensive.

The adoption of digital technologies by print buying organisations is altering the relationship between customers and suppliers (6.2). If printers do less of the pre-press work, then customers have to take on more responsibility for their content. However, this also means customers are getting less value from printers than formerly, so pricing structures are having to change. This is an additional reason printers are looking for new services to enhance what they offer customers and to achieve competitive advantage.

As more of the inter-organisational workflow becomes digital, bandwidth becomes a more significant problem (6.4). ISDN is not perceived to be a solution, as (in the UK) it is both too expensive and inadequate for the file sizes now transmitted, which are frequently in excess of 40 Mb per page. In addition, small companies, particularly design and translation agencies, often cannot afford ISDN lines, and so digital workflow between print buying organisation, print management agency and printer is broken at these points. There is little incentive for the larger organisations to fund the purchase of digital communications infrastructures for these small organisations, as print buying organisations change designers quite often.

The last few years have seen the growth of Internet based print brokers and print auction sites. These sites were not felt by the participants of this survey to constitute competition to the services they offer (7). In this market sector, high customer service and the continuity of service offered by established (but still benchmarked) relationships are important customer values: these are not offered in the model of intermediation offered by these Internet businesses.

Participants of this survey could see high value for them in the development of workflow tools, to help them control and manage the complex business of print fulfilment (8). There are currently no tools or sets of tools which enable management of the entire process across businesses, and which integrate with existing MIS systems and ERP tools. As printing and publishing merge, and as the demand to re-purpose content for publishing across media grows, such tools will become more valuable. Tools are perceived to be needed for providing support for managing marketing campaigns in the print buying organisation. Project management and communications tools are required by print management agencies and printers to assist with the multi-organisation process of managing and coordinating complex workflows. Importantly, since print projects are characterised by changing schedules, tools are needed to help organisations manage the workflow changes and communications required when schedules change. These tools need to be integrated with each other, so that digital data can flow seamlessly between organisations eliminating duplication of time and effort.

1 Introduction

The following study was based upon analysis of interviews with printers and print management agencies whose customers are mostly medium and large companies and multinational corporations. Interviews were carried out in the autumn of 2000. The study's purpose was to understand the participants' current business and technical environments, and to explore particular problems and challenges that technology innovations could improve or overcome.

Three printers and four print management agencies, based in Europe and the UK, took part. The sector of the print market they operate in might best be described as high end, non-commodity printing where each product is unique. Examples of the work managed and printed for enterprises includes marketing and promotional literature at national and multi-national levels, annual reports, product literature, and magazines and publication publicity material.

Quotes from the interviews are used throughout. These are reproduced in italics.

2 The business environment

2.1 Background

The following statistics are provided by the British Printing Industries Federation [1].

- The print industry is the fifth largest of the UK's 23 manufacturing sectors.
- It employs more than 170,000 people in more than 12,000 companies.
- Its capital expenditure is of the order of £750 million annually
- The vast majority of printing companies employ fewer than fifty people; just twenty companies employ more than 400.
- Products range from advertising material to packaging and stationery, using substrates ranging from paper and board to glass, plastics and foils.
- The value of sales in the printing, packaging and graphic communications industry is about £13 billion, 1.7% of the UK GDP.
- Sales in advertising literature, the largest sector in terms of sales revenue, have increased from c. £1,678 million in 1994 to over £3,102 million in 1998. Some of the other large sectors (over £1 billion annual spend) have shown more modest increases (periodicals, and programmes and tickets) while others have shown spending declines (books, booklets and pamphlets).

2.2 Printers

The (UK) print marketplace is currently shaped by several factors. First, the extremely high capital costs of printing presses and other equipment, and second, print over-capacity. This means that to make a return on the investment in machinery, printing equipment must be run 6-7 days a week; 24 hours a day. The consequence of this is often that printers oversell their capacity in order to guarantee full presses. Or course, this sometimes backfires, and printer may be forced to outsource some of their load.

A secondary effect of this is that when printing schedules changes - and change is the norm rather than the exception in the printing industry - it is difficult to re-organise the schedules. To do so in a way that still optimises the use of the presses is even more so.

Print is often viewed as a commodity – particularly by the procurement functions that are increasingly powerful in today's more focused and centralised corporate business models. Print is

not a commodity: printers with the same equipment have different expertise; the quality of the output is affected by the skill, training and care of the human operators of the presses; the age of the presses makes a difference to the quality of the output.

> *But still it's just more than how to deliver a file to a printer, it's how well that job's printed, it's the quality of the kit you're printing on; for instance, we have brand new printing kit and the difference of that kit and the kit that was sold 3,4,5 years ago is significant.*

In some sectors (e.g. finance and banking) where procurement functions are powerful, that creates tensions, as procurement and marketing functions engage in internecine battles over print supply relationships. This means that printers have to expend more of their effort in retaining these customers.

Overcapacity has some distorting effects in the market.

> *... in the UK as a whole, we can produce far more print than is required for the marketplace. There are people coming in with very strange pricing - producing complete jobs for slightly more than we can buy the paper for... It's all about filling capacity. If you have a slot where there's nothing else to do, and your return is only a couple of hundred quid, you might as well have the couple of hundred quid.*

2.3 Customer and supplier relationships

Business relationships within the printing industry are changing. There's a new emphasis on 'partnerships' rather than 'suppliers' and 'customers'.

> *We are effectively very close to our customers. We are often on site with our customers, working like colleagues with our customers. There are also threats on that side, but that makes it clear that that is the type of relationship our customers are looking for. They're willing to outsource, they're willing to build up relationships, they're willing to build up partnerships: they're not looking for traditional client-supplier relationships. They're looking for long term relationships.*

This reflects an increasing emphasis on acknowledging mutual dependencies. It is in the interests of partners to help each other achieve efficiencies to drive down costs of service and production, and to achieve quicker fulfilment times. This often involves potential partners examining each others' processes and suppliers and working together to change them in order to 'drive out cost'. For example, one company may achieve cost reductions by using a partner's distribution network.

> *We work with big companies. Big names, and, the importance for us is they all have brand positioning. They all have a need for consistency and, fundamentally, they all want to rationalise their supply base. They all want to take cost out, and they all want their products to market faster. Now we are thinking intelligently about how we deliver that. ... We've tried to be drivers of service culture, and linking in new technology. So we've started to introduce new technology to our clients. We distance ourselves from competitors. Therefore we are seen more as a partner-supplier.*

Taking it even further, some print buying companies are beginning to create federations from their competing suppliers, who are realising economies as well as workflow efficiencies as a result of collaborating with competitors. The following observation was made by a printer of one of their large print buying customers:

> *They have nominated a group of printers with whom they intend to work over the next three years. I think they're handling it in an extremely intelligent way, and in brief preliminary*

discussions with the other printers, we can see some joint benefit in having common workflows, which we nearly are anyway. So we don't have to do much to reach a common workflow and then we've got all of the problems out of the way: of funding say, high res. proofing devices, low res. proofing devices sited at the customer's end. We don't have to put three of the things in; we can put one thing in, and we can fund the support of that reasonably cheaply.

2.4 Outsourcing print management: the print management agency

Organisations are increasingly outsourcing their non-key functions – of which print is an example – in the drive to focus on their core competencies and drive down costs.

Print management agencies work with people in these outsourcing companies to reach a job specification for the material to be printed, and they take absolute responsibility for securing the printing of the material. Their customers usually do not know, and have no interest in knowing who the printer is. Additionally, the print management agency may also manage translation and other requirements for multinational projects, storage, printing and distribution (or distribution and printing), and will also need to work with the creative/design agency with whom the organisation chooses to work.

> *…. our added value is that our customers can concentrate purely on the content itself, and we can arrange how it's being visualised, published etc according, of course, to the rules of the customer. They don't have to think about it. They don't have to think about localisation or cultural issues or print issues, paper issues - whatever. So that is a strong combination.*

> *…. the key word in our business is always complexity, because people outsource to us the most difficult jobs: because they don't have the resources, or they don't have the knowledge or they don't want to take the risk, or whatever.*

Handling complexity is a key value that print management agencies offer. Printing is inherently a complex process and print buying is a highly skilled job. Additionally, many different suppliers may contribute to any one print project, and so when there are changes in specification or schedule, many different contributors to the process will need communicating with.

> *It's our responsibility to handle all the relationships and suppliers. When changes are made, we might need to communicate that to as many as five or six companies.*

Print management agencies also have very important rôles as advisors in many different capacities ranging from cost-cutting and rationalisation exercises to troubleshooting, in which respect they, like printers who deal directly with customers, might have to modify artistic plans drawn up by advertising and creative agencies, who may have little direct experience of print.

> *It's also our responsibility to say to someone 'OK, you want that orange on a very toothy uncoated paper, it's not going to look like that, it's going to look different'. Now that's our responsibility to tell that to the client, through the agency if that's necessary. If we're not doing that then we're creating a whole lot of problems for ourselves. That's what comes with experience and production scars.*

> *…if you've got a direct mail job, do you want to put it on heavyweight material? Probably not, but the designer might have specified that, because it looks and feels nice. But we might say, 'actually you want to print it on this weight of material. It comes in under a certain weight, therefore you'll save yourself a small percentage on print, but a huge percentage on the postage.' Looking at obsolescence, because waste is going to cost people. They're going to have to pay for binning brochures and manuals and other products that sit in racks unused,,*

because the products have changed. Where we can actually manage the right size print job, to the right size press configuration. Because presses all vary.

We control customers' ordering patterns for them in many cases. e.g. they cannot afford to run out of bills, so we make sure they don't. 'This is how many you have left, this is how many you've used this quarter, how many do you want?' We spoon feed them the information. We mail shot to 200 [branches]*, get all their responses and aggregate them into one print run. We have fall backs, and contingencies e.g. blank sheets that anyone could use. We bully them when they don't respond. We have to track who hasn't replied, or what replies don't make sense or have errors. e.g. they've only ordered 1,000, but they use that per week, so someone's made an error. That's where the experience of the account managers comes in. That's difficult to replace; you can't computerise that."*

…Or they've used incorrect fonts where they don't have font licences. So therefore we have then an issue for our clients, to say 'we cannot use the fonts supplied because you are not licensed to use them.' Therefore, you could have a legal claim. … We have to try and protect our clients.

Print management agencies are a growth industry and see their rôle continuing to increase in importance.

Print management is where it's going to be for the simple fact that there's been massive consolidation not only in the paper industry, but massive consolidation in the print industry, where little guys are being squeezed out because they don't have the money to reinvest. Large corporates want a large corporate printer. They don't want to deal with somebody who's just working out the back of a garage, because they want to make sure the company they're dealing with has environmental accreditation, quality assurance, contingencies in place, the scope and power if the job goes late or if they give the artwork late to still hit deliveries. You know, the impossible, they will want that. But with the consolidations going on, we certainly see that the growth is with print management. The understanding of print and workflow, and where technology can help. So not *auction sites,* not *brokerage, but actually* management. *Looking intelligently with the client at specification, fitness for purpose, getting the right printer and so on.*

As digital technologies revolutionise the print industry, effective project management and automation of the workflow are becoming ever more important.

…communication I think is key, and especially the key word in our business is always complexity. So if it's very complex, first of all you need to organise it very well. You need to keep an overview yourself, you need to be in control, and to do so you need tools yourself. Then, it's very simple. Customers always experience that you as a project manager are in control if you can send them very clear chunks of information .

… and then really being able to publish media independent, either through traditional print or directly through the web or printing-on-demand or whatever. Based on that model, we are now working on really re-defining or re-engineering our processes. We also really feel more and more a need to automate our workflow where possible. Communication and information are the two areas where these workflow tools, in the opinion of our customers, really add value.

Currently print management agencies experience problems in project management because of the absence of tools to support workflow, and because they are not well supported by their customers in managing workflows. The same is true of printers who work directly with their customers.

There are some workflows available now…. the missing link is the customer understanding the workflow….Because it frequently is not a large enough component of their task. So you may be

commissioning quite a large volume of print but it is not your major task. It is not what you perceive your job to be mostly about.

We always say it's a pity our customers don't first agree on our workflows, and then give us the business. In many cases they even do, but later they say 'don't talk to me about these procedures! I just want to have it done!' That's the struggle in companies like this. On the one hand, you really try to organise it very strictly and use very clear workflows, manage the process efficiency, measure your efficiency, get continuity and quality. It's very, very important. On the other hand, our products are always tailor-made products, not products off the shelf. We're not producing goods [commodities]*. You always have to adjust your process. Your customers are always part of the production process.*

There are a lot of manual steps in the available technology to manage content and publish content, and there are only manual steps in the design and management of a project. There are tools that can help you manage the different steps but you have to design them, and that's the human thing today.

2.5   Print buying expertise

Let me put it like this, they [customers] *understand just enough to be dangerous.*

As part of the outsourcing process, print buying is in many cases becoming subject to centralised control. In the past and decreasingly so today, the procurement of print has been highly fragmented within a large company, with several different functions buying it, and different ways of measuring its cost. For example, are the postage costs for printed material classified as a print, marketing, stationery or another expense? It has apparently been very difficult for these reasons for companies to know what their annual print spends are. One print management agency said that because of this fragmentation, it can take 6-12 months of working with their corporate customers, depending on the size of the business, just to fully understand how much print they are buying! Bringing this all under control, with consequent cost savings, can be one of the results offered by outsourcing.

> *Because most companies do not know what they spend on print. They think it's about - I've got an example now. A large [] organisation reckons their spend to be between five and ten million. Now that to me means they don't have data, don't have information, and don't know what the hell they're doing in real terms. Between five and ten million!*
>
> *One of the biggest problems they all have - and the bigger the organisation the bigger the problem - print is so fragmented around their organisation, they really don't understand what is involved. We have a yardstick with companies we've talked to and dealt with, and it can take anything from six to twelve months depending on the size of the business, to actually often fully understand just how much print they are buying around the group, throughout Europe, throughout the world. Because that's the ultimate aim of course, is to get a handle on everything. But often it's everybody from Tracey in the typing pool to the PA of the Chairman, marketing teams, all sorts of people, they're all getting involved in buying print, and they're all doing it independently of each other. So, in many instances, it's a very difficult thing to quantify: the volume of the print. And trying to predict the frequency. The knowledge of that is so dispersed all around their business. They can never give us a clear story or a clear brief. That's one of the biggest problems right now.*

The large corporates are amongst the first to have outsourced They thus tend not to have print buying expertise within the company any longer. Those who purchase print may only do so as they inherit this rôle as a result of their main job function (e.g. marketing managers). This means printers and print management agencies increasingly have to deal with print buyers whose expectations and understandings of technical print issues, processes and costs may not be

informed or reasonable. They have to assume a new rôle in educating their customers about print issues. Often customers are not particularly interested in acquiring this knowledge.

> *Quite a lot of organisations these days do not have dedicated print buyers. And it's not an amateur sport unfortunately, even with all the stuff that's going that helps to make increasingly it a less highly skilled operation. Our customer service operation is replacing the lack of skill at the buyer's end with support and hand holding and whatever is needed at this end. And so we are constantly calling customers, e-mailing customers, PDF back to customers, saying 'do you really want to do this? because it's going to go pear-shaped if you do …'*

> *We have had people say to us 'why do your people ask us so many questions? None of our other suppliers keep asking us these questions.' 'We ask you the questions because we want to try and find out what you do, and if we can help you do it.' We have to be careful sometimes. You do get people out there, who do genuinely believe it's a commodity, and will just bully the commodity supplier into a lower price. We do sack customers. We do say there is no point in us flogging this horse any longer. It happens.*

> *I just checked a job with a customer who complained about the quality of their images on their page supplied by them. But we have to check them and tell them what was wrong with them. Why? Because we have the knowledge and skills to do it. They don't.*

> *Procurement divisions just see price. They see the product and they see price. They don't see anything of the support systems that we put in. At its most basic we have two choices. We have choice A - I'll just get out, if this is the way it is - but choice A is to rip every single piece of cost out that the customer is not prepared to pay for, just everything. Take out the high customer service content, take out the high sales cost content, rip out anything that the customer isn't genuinely prepared to pay for, turn it into a commodity-based business and go trading on the web.*

The lack of knowledge and or interest in print matters is sometimes made worse by inappropriate expectations of digital technologies and processes. This can result in false comparisons being made between the costs of what (it is thought) could be done in-house, and what is done at a printer's. In the words of a printer, for example:

> *…one of the things that we want control of is the scanning…… If we don't have control of it, we would like the control of it to be in a safe pair of hands …… We've got £50,000 scanners. The problem is, as part of the drive to force marketing department spends down, they will very often purchase their own scanners. Because if we're charging £8 each and the scanner costs £500, then they think 'we're going to get our money back quick on this.'*

2.6 Changes in what is being printed

In the last years there have been significant changes in the ways that companies use their marketing budgets: spending is more rationalised, and this is a trend which is set to continue.

> *I still remember the good years of offset printing where every brochure was meant to address the need of one single product. Family brochures was a concept that did not even exist. So for product 'x' ten years ago we would produce anything between five hundred thousand to one million copies. … What happens today is that literature traditional is being segmented in a different way. You see consolidation of product families for instance. We see it at a whole bunch of different customers, who have a range of products in one brochure. This is typically bigger, thicker, and must be glossy because it is the only one they will do, so it must be very good. They do it in lower quantities, say, 250,000 because the product life cycle is so much shorter.*

> *… run lengths are dropping, marketing materials are dropping, because you're getting much cuter about the number of people that you want to send it to … And so the wastage is lower*

and people are seeking much higher response rates from their marketing material than they used to. People aren't satisfied with 1 or 2% any more. The impact on our industry is that we're printing just as much stuff, but printing less of more items, so run lengths are dropping.

Traditional brochure are still available, but most companies are cutting down on their overall productions of brochures because of the life cycle of the brochure. You know life is going much faster, so you'll see that companies who used to produce brochures to last a year, now produce brochures to last half a year.

[Mass] mailings can come in all shapes and forms although there is a trend to stay within traditional kind of formats…Costs of mail are so huge if you have odd formats or odd shapes of envelopes that you see lots of mailing going back to fairly traditional kind of formats.

We've seen the balance change as well. In the past clients were spending their money on marketing collateral. They're now actually spending the money on literature that actually accompanies the product in the box. So, you know, other services, other products in the range.

Some print management agencies foresee growing complexity in future marketing campaigns as a result of changes from less well targeted to more focused marketing.

I see a development that business is still growing in complexity instead of getting less complex. I think that due to one-to-one or one-to-few marketing … the budgets of companies will stay the same, but the use of it will change. So instead of mass mailing a simple black and white letter, you're going to use beautiful paper, beautiful colours and marketing gadgets. So I think that the complexity of things will grow, so that the need of a system and of a partner that's aware of the complexity of the programme also grows.

Marketing campaigns which are more focused and higher quality also cost more per unit or material produced, but print buyers' cost expectations are often not realistic.

Certainly yes, that's also another component which you see in particularly below the line areas. You'll hear customers say that they want a twelve page family brochure that must be super glossy, fantastic looking, that will only be produced in so many units and they expect it to be produced for amount 'x' and it's absolutely not realistic.

They do it in lower quantities, say, 250K because the life cycle is so much shorter. They still expect it to cost 6 cents. They don't realise that more pages, higher quality paper, lower quantities will imply that your piece is going to cost you one dollar a piece. And they're like 'why, if I am producing less, I am spending more money?' and 'why if I have this budget and I want to achieve so much can't I do it today?' If you look at traditional offset printing, this is a fact of life. Large quantities, your cost per unit is going to be low. The smaller the quantities, the more complex your literature is, the higher the cost for you. Your total costs will be lower but the percentage of saving that you make, it's not going to be as high as you would like it to be.

2.7 Specialising in different markets

Print management agencies and printers sometimes specialise in a particular marketplace. This contributes to promoting the organisation as one which understands the needs of customers in that sector. Taking the dynamics of that industry into account, the company can develop services and processes which focus on industry-specific needs, and can anticipate needs and problems.

Normally they [i.e. larger printers] *are quite focused on particular markets, and their skill sets are as much as to do with how they relate with those customers than their ability to put ink on paper.*

The needs of companies in the blue chip sector, with their high rates of product obsolescence, are very different to, say, the car industry, whose product lifecycles are much longer. This creates different sets of needs of publicity and advertising material, and correspondingly requires different print management approaches.

> *We used to have a very strong angle, which was that we could manage data better than anybody else. And we used that to sell into the publishing market, to manage catalogue databases, complete stock list databases and those kind of things. That has suffered dramatically because of the advent of Microsoft Access and other things. So that is no longer a valid place for us to be …. and we have found that we can gain credibility in understanding precisely what a particular marketplace requires.*

> *You understand the dynamics of the industry and you can anticipate needs. Take the PC world. Extremely competitive, maybe 5 or 6 companies struggling to get their products out in time. The implications of having a product released without having the literature available for it can cost millions to a company. We understand that and we have developed services that are focused on preventing that from happening.*

Printers may also specialise in particular sorts of printing: such as black and white, or five or ten colour printing. In addition to their printing presses, many printers have their own finishing equipment: folders, staplers, binders, laminators, cutters and so on.

2.8   Extending print business models through added services

Because the print marketplace is so competitive, and because it is no longer enough to seek differentiation from competitors through speed, quality or cost of service, many printers are seeking different ways of enhancing their attractiveness.

> *…there's very little differentiation that we can make in terms of the kit we've got. I don't think printers can do that anymore.*

> *Anyone can produce the products - what do we offer that's different? Technical expertise and pre-press, exceptional customer service, training &c, so it's reintroducing those as well, because otherwise we're just another print supplier, and then it would just be 'I've up to £500 to spend, and I don't much care who does it.'*

Specialising, discussed above, is one way of achieving this, but is not enough on its own. Hence many are looking to develop new services. Some examples include:

* Databases of customers' past work, allowing them retrieval, adaptation and re-use of the material for a fee. (This is a service designed for a very specific market segment).
* Personalised customer web pages, from where customers can make queries or track their print jobs, or re-order print.
* The acquisition of a photo library, from which customers can purchase images.
* A reprint service using a digital press.
* Variable data printing (personalised publications and mailings).
* Storage, managing inventory, and distribution of materials.

This also involves educating and encouraging the customer to become aware of the possibilities newly available from digital technologies:

> *There may be instances where we're actually having to go to our existing customers and say 'we have this feature, variable print. Is there something we can do for you which uses it?' and 'how about this as a suggestion?'*

2.9 Changing rôles

Relationships between suppliers and customers are still of key importance (see below). The relationships between the networks of suppliers who contributed to any one project are no less important. Changes in the business environment and in the technologies which support it are also having their effects upon what partners want of each other, and the ways in which they work. Many organisations are expanding their expertise, and/or expanding existing relationships to enable them to meet new needs and expectations. They are often doing this rather than developing new relationships with organisations which might become part of the existing fulfilment network. Several examples demonstrate this trend.

Some print management agencies have also been approached by consultancy firms who are looking for partnerships with them. The consultancies' increasing experience is that the customer wants them also to supplement their consultancy with its execution. Since this is not their core competence, they are looking to their existing partnerships with print management agencies to supply this.

Some print management agencies have found that their customers want them not only to manage the printing and publishing of their project, but also to manage the campaign itself.

> *In our opinion it's a clear trend, where companies and customers are moving in the direction of content management. Content management, so that they can publish media independent. They're talking about re-purposing the information.*
>
> *If [different material] is put together, then the [company] brand must be there in one way, not seven. So that's also an area of interest where we are being invited to come up with ideas. 'OK, this is our house style, but if we want to publish it in several ways and if we have campaigns, can you manage our campaigns?'*

Some agencies are taking print management a step further by defining complete solutions for their customers, the print buying organisations (i.e. helping customers reach their marketing objectives, not just managing the printing or publishing that the customer has defined). For example, this might encompasses analysis and redefinition of customers' marketing objectives, through to the media and the channels which should be used to achieve these objectives.

> *We go back to basics with the customers, right back to 'what are your objectives?' and discuss whether they are setting about achieving them in the best way.*
>
> *There are even examples where we are defining channel marketing solutions ourselves, and offering them to the market. Because we learnt in the last ten years from our customers... together with partners we can come up with a fully integrated channel marketing solution, combining a web store with direct marketing, with a completely localised fulfilment & payment system, &c, &c. So that's a completely different approach. From the contractor to the architect to the project developer - today we are all three of them. So you can just can come over and say 'I would like to order some brochures - or a web site - I'm pretty sure I need some printed matter - could you think about it, design it and produce it?' Now we go to the customer and say 'we have a new channel, and you can sell more products just by using our channel.' So it's all three of them.*

Some printers are planning in a way which moves them more into the print management sphere. Some spoke of working with trusted partners to create networks who together make up the capability to form a complete and flexible supply chain from design to distribution. The flexibility means that in that different packages can be put together to meet different requirements, and the printer takes responsibility for the successful and satisfactory execution of

the project. (The print management agencies observed that they are increasingly finding that their competitors are printers as well as other agencies.)

Correspondingly, some print management agencies are also extending their services in ways that compete with some of the finishing and despatching services more traditionally offered by printers.

> *We are talking to this client right now: they have upwards of 25-30 brochures all selling different product ranges. Within each brochure there are various language editions. They all need storing, and all need to be requisitioned on what we call a pick, pack and despatch basis. It would work that we would receive an e-mail by midday today from say, the Paris office. They'll request 3 or 4 types of product brochures, they may request them in French, English, plus any other language. Amongst that, they may require also some additional stationery, business cards and maybe some invoices, for example. That afternoon, we would pick them from the shelves, we would pack it and then it would go out via an overnight courier, one of the national couriers, and it will deliver tomorrow. That currently is a growing area.*

2.10 The effects of digital workflow technologies

As business relationships change, so also does the nature of the services supplier-partners offer. Agencies and printers are having to acquire competence in areas beyond their core ones. While purchaser-partners are focusing on their core competencies, supplier-partners are having to expand their core competencies as a result.

One of the principal competencies that agencies and printers are having to acquire is expertise in digital technologies. It is important to remember that agencies are expert in print project management and printers are experts in *printing* first (putting ink on paper). However, as digital technologies move into more business places, presenting alternatives to, and in some cases replacing older technologies, agencies and printers have to be well placed to make choices about and to use leading edge digital technologies. They also need to educate their customers about computing and communications technologies. In addition, they need to be aware of what digital innovations are forthcoming, in order to be amongst the first to adopt them.

Adoption of digital technologies helps agencies and printers reduce costs and improve their efficiency. Reduced costs can be shared with the customer, improving supplier competitiveness. However, the customer has often to be educated and persuaded to adopt digital technologies - such as Adobe Acrobat, in order that files can be shared digitally. Use of digital technologies also enhances the service offering to the customer, increasing attractiveness relative to competitors, and strengthens the customer relationship by helping them achieve new efficiencies in their own businesses.

> *We have gone out and actively promoted PDFs and helped them sort it out. Partly defensively, because we'd rather do that than our competitors. There were significant gains to be had on both sides doing that. Therefore, we think it was a good thing. It puts us in a better relationship with them because we've showed them, helped them, to make those gains.*

It is not always the case that both partners perceive the need for this new approach: it is often the supplier-partner who takes the lead in educating the purchasing partner. Many print buying organisations are not particularly knowledgeable about the intersection of digital and printing technologies and therefore require education and support in the use of new technologies. Some companies go to considerable lengths to educate customers, providing training courses and literature.

I can think of some [customers] whose driving force behind them is quite technically aware, and therefore it's quite easy to sort problems out. And then you get other ones who are quite technically unaware, and it's an uphill struggle to explain to them. So you know it's a people problem, and it's how you manage those relationships, if it makes a success or not, I think.

Some printers are assuming a technical support rôle when their customers install new technologies:

... what we've done is we've put a workflow in place for them to do a,b,c and then get the result at the end; if they follow those rules, then everything's OK. And we've been very careful to do that. Go there and set it up for them, if they like. We become their support for them.

Like a customer yesterday. His Macintosh blew up. He had to have a new one reinstalled and because I went up there originally and set it up for them, therefore, we had to do it over the phone yesterday. It took two hours on the phone!

We have dedicated people here who are tasked not just to be here, but also to jump in a car and tell them how to run the software that they've bought, because that is also an issue.

In addition to educating print buyers about digital technologies, and promoting their adoption, printers and print management agencies also have to cope with the consequences of misapplication of digital technologies: dealing with content that is in the wrong digital format (with what format has a CD been written?) or is badly digitised (bad scans), is incomplete (a missing font) or not usable (a non-valid RIP-able Quark Xpress file).

There are currently many problems in agreeing where responsibility lies, as customers take over more of the pre-press work.

The files aren't prepared in the correct way to come to our printer.... when does it become our responsibility to check and find those pictures? Some of our customers will say 'yes it is, you're the printer, we want you tell us when a picture we've supplied you is not correct'. What is the cost involved in that? That's the problem.

If the file has not been originated [here], then it's difficult for us to take responsibility for it. But we have a service we offer to our customers, and we are the experts and therefore - you have to know your customer.

... it's difficult because a lot of the time they actually don't want to take responsibility, and they don't have the time to educate themselves. And this is the problem really. It's changed because like I said before, technically the job was always controlled within the industry. The typesetters would prepare it for the printer. But now the customers have been asked to employ the people to do the work themselves. And they want to do it because it's cheaper. We want them to do it because it ties up a lot of our resources here, whereas our main objective here is to feed the presses, is to keep the presses running.

This also causes additional problems, such as with scheduling.

.... you could receive a 32 page job, say, that might take you 3 or 4 days to produce, and another one might only take you half a day. It depends on how well it was prepared. As soon as we asked our customers to do that, one job could be a massive difference to another. Whereas if we have a typesetter that is supplying us with the work, it would come in at a standard rate.

3 The value of inter-organisation relationships

New Internet-based businesses are being launched on the assumption that more and more print buying will be mediated on the web, through auctions or through brokers. There are several different business models, underpinned by different assumptions about the requirements of participating print buyers and print providers (see Appendix). One family of these Internet businesses implicitly assumes that relationships do not matter (perhaps because print is perceived to be a commodity) and builds no support for them into its model. They simply put buyers and sellers in touch, and do not vet the sellers, nor assumer responsibility if things go wrong.

There was no evidence in this survey that relationships between print buyers and print suppliers are no longer significant. Just the opposite: the need for person-to-person relationships, between the business partners remains strong. It was frequently reiterated that customers want to meet, want the personal touch, want to deal with the same person within an organisation, and want 'to feel that their job is more important than the others.' Additionally, most potential partners of printers wish to inspect their premises and equipment.

There are many benefits, to customers and to suppliers of both long term business relationships and of personal knowledge of each other.

Efficiency and cost benefits

Some of the primary benefits of relationships have already been discussed. These are the benefits in efficiency gains and cost reductions that come from developing common workflows, and sharing processes and services.

Education and improvement of processes

Through working closely with customers, a more detailed understanding of their requirements is developed, which again assists efficiency and effectiveness.

> *We improve because they tell us how to improve, we learn about the marketplace, we anticipate their needs, and also possibly get more work from them because they feel comfortable with us……I think it's still a people business in the main.*

Related to this, suppliers learn about market dynamics through their customers:

> *And the loyalty might be that they'll tell us how much they're going to pay for the project rather than just place it with someone else. But that's worthwhile information for us as well. Rather than just going to another print supplier, they'll at least say, 'I only have two and a half grand for this project'.*

Trust and reliability

A history of successful interactions with business partners, and the consequent confidence that that imbues is worth far more than cheaper job quotes. This includes confidence that job quotes are realistic, that deadlines will be adhered to, that staff are skilled and careful, that machinery is properly maintained, that the suppliers for which that partner is responsible also deliver a high quality service, that there are contingencies for handling problems, and that problems will be responded to appropriately.

> *This is fairly important piece for these customers. One foul up on this will make a very significant dent on their profitability in that year. So I don't think you're going to auctions on the web to produce this, because it is too important.*

You wouldn't go to a dot com, because you don't know who you're ending up with, and ensuring the quality that you yourself would deliver is imperative. Risk avoidance and surprise avoidance. That's what it's about.

One reason that this is the case is that the skill and care of the human operators of the printing machinery contribute significantly to the quality of the end product.

If we've got a big one going through and we've outsourced it, I would always send one of my people to check it off on the press. Always. Even though I trust them, I don't trust them that much!

One printer commented that some organisations buy digital technologies and assume they can take over pre-press work that used to be done by the printers: flatbed scanners are a good example of this. Without the trusted relationships between provider and purchaser, the purchaser has little reason to trust the advice of the printer:

..... they'll think you're ripping them off otherwise, 'well of course you want to keep control of it!' So you do have to have a relationship to have a sensible conversation about that.

Idiosyncratic knowledge and managing workflows

For printers, long term relationships with print purchasers means that part of their workload is predictable. They know the nature of the printing these customers require and, to the degree that repeat print jobs are required, can forecast future workloads. This is, of course, preferable to the uncertainty of relying mostly upon one-off jobs (which is at least one consequence of Internet auction based workflows).

You'll say, 'well, these people have been late pretty often; we'll assume they'll be late today, therefore, we'll do this move here.'

...he took the trouble straight away to phone us to tell us there was a problem. So when he says it will be here this afternoon, you know it will be here this afternoon. But other people wouldn't even bother to ring you. It just wouldn't arrive and you realise there's a job in on our schedule and it just doesn't come. So a lot of it comes down to human element in the end.

This is no less the case for print management agencies then for printers. When companies come to know each others' processes and partners, and particularly their idiosyncrasies, more accurate scoping of the work can be carried out, despite what customers say.

We do try to standardise: we know that a job with these given specifications can be produced within these time limits. But because it is this one particular customer, let us build in so much buffer, because we will have to take into account that that particular agency is taking part.

Favours

Because schedules in the print industry suffer frequent change, and also because machinery is run at capacity where possible, printers, and therefore also print management agencies frequently find they are in danger of being unable to meet a customer's deadline (although the reasons for that often originate with the customer). Print management agencies and printers therefore need to find alternative suppliers who can meet the need. Both types of organisation emphasised that relationships are essential for solving such dilemmas. Relationships mean that printers called upon in emergencies do each other favours.

So we have trusted fellow printers who we call and say 'we are in the deep stuff, we need this capacity and this is when we need it and this is what we need'. They do the same to us.

3.1 Management of partner networks

The need for relationships and all the benefits they bring has to be carefully managed. Most companies do not want to be too dependent upon too small a number of business partners, and so they have to develop an appropriately 'healthy' number of partners. However, they must also manage the amount of business that any one partner receives from them in order to continue to remain as a significant force in that partner's perception.

> *We'll want to work with people who want to work with us, that's for sure, although not to the exclusion of anything else of course. You wouldn't want to be seen to be favouring one supplier above another…….. In getting quotes together, we've often got less than 24 hours, so it opens up a new can of worms really. They will turn quotes round quickly for you if they think they're going to get a good stab at the job. But if you're always quoting and never give them any work, then they're just as likely to say, 'It's [company name] - we'll put it at the bottom of the pile. We're always quoting and never getting any work from them.' So that's another consideration that we have to take into account.*

3.2 The human element

Relationships are important because of the richness and continuity of experience that they offer. It could be imagined from this that many of the above benefits could be experienced in automated or Internet mediated services - that is, services without human contact. That however, is important, and cannot be automated for many different reasons.

> *As a company we feel, in everything that you do there is a risk. A customer needs to be reassured. Number one that I made the right choice, and number two, if something goes wrong you will be there to help me get through it. So when you provide services it's critical to capture that need for reassurance that each of has.*

> *Sometimes, a project manager based on experience, just sees something and says 'I know this is going wrong. Don't ask me why, I just know it's not going to work. I am going to call the printing plant' or whatever. Because of experience, he calls the printer and says 'listen, I don't know why, but I have the feeling this image, or whatever, has gone wrong' and the printer says 'OK, let me check…. Yes, you were right. How did you know?' That's called experience. There's no process whatever. On the one hand you say, 'why do you need to follow a process? Because what went wrong isn't documented, so how can we learn from it?' On the other hand we are very happy that this person used his personal skills to save the project or prevent it from going wrong.*

> *When you scan images, it is very subjective how people want those images portrayed. …They might want the colours changed slightly. This guy might have been on holiday and the rest not, and they want there to be a similar look and feel. So they'll say they need to have the ability to talk to us, face to face, or on a telephone and say 'look, this scan here of this guy, we want you to match his skin tones to the rest of the people, otherwise they all look anaemic and he looks too healthy,' for argument's sake. Now you can't really do that electronically within a workflow format because you will lose some of that ability.*

> *They might well have caused us two or three days delay, and they say, by the way, I still need it for the Motor Show. …We say 'I need to throw overtime at this' or 'there's extra costs to do this' or 'I need to put it somewhere else to get this laminated' and it's probably more expensive so you say to the client, 'I need another two grand' or 'I need another £100'. Or 'you had a 50,000 run for the Motor Show. I'm afraid I will only give you a 1,000 for day one. However day two I'll give you another 2,000. Day three I'll give you 5,000' and so on. So you have to talk to them, which is why you have to talk to them, because you can't just say in an e-mail 'sorry you're not having the job'.*

4   Current problems

4.1   Management of changing workflows: printers

Print is notorious for schedules changing at the last minute.

In the printing industry, the maxim is that 'change is the norm and not the exception'. Many changes occur early in the lifecycle of a print project, at the creative stage, when the print buying organisation is still scoping, designed and finalising the content of the material to be printed - changes in text and images in flyers to annual reports. More changes occur at the proofing stage, not necessarily because of errors, but often as a result of unpredictable dissatisfaction with detail. In the management of print projects, print management agencies have to anticipate delays and changes to the planned schedule.

> *...one of the amazing things is to see how the creation and design are in fact the most time consuming exercises throughout the whole information supply chain. If we plan a project to be executed, in say, four weeks ... what we see happening is the time required for creation of the content and the design actually expands, and leaves two weeks instead of four to actually execute or produce the project. That's where we experience most of the problems. For two different reasons, one mainly being our customer either not knowing exactly what they're trying to do, or having to live with the reality of last minute changes, trying to minimise the obsolescence of their final product. And the second thing is personal taste about copywriting styles or look and feel. Every person will want to bring his or her own personal taste in the design of* [whatever it is] *and that means back and forth with the agency...*

These affect workflows downstream and require adjustments to project schedules, and communication with all parties affected by the changes. When the partners in a transaction know each other, realistic prediction of change and management of it, is facilitated.

> *We build in buttresses. We know our customers better than they know themselves! So if they promise they can deliver, if they say 'this creative agency, believe me, is going to deliver in seven days', we know if we are lucky, it's going to be nine and most likely thirteen, so we build in ten days, so that we can absorb some of their delay.*

One printer estimated that 50-60%, and possibly more, of their jobs change their schedules, although he noted customer segments differ: 'financial services are like clockwork, but marketing people are all over the place.'

Printers have to base their production schedules upon the assumption of change and have to devote much time to changing their schedules, with the twin goals of optimising the use of their printing and finishing machines, and meeting all customers' deadlines. This was described as a 'reasonably tough' problem.

> *We just schedule it on a daily basis. And I can tell you those guys will be scheduling now, and the schedule will be invalid in four hours' time. So it's a permanent nightmare, and it's the highest stress position in the company.*

> *It's a very accommodating industry. The problems that we've discussed here, they're not exclusive to us; it's how the industry operates. Deadlines are often broken; therefore, the industry has to accommodate an almost ever-moving situation. Printers are very adept at doing that.*

> *A customer phoned up this morning and said that he'd sent us the job overnight and it crashed during the night and therefore the job's not here this morning like it should be, so they're already half a day behind with their schedule. But you have to allow for that: well it is allowed for. We automatically do build it in even though it doesn't seem it's the case.*

You've mapped your week ... and suddenly, someone says 'no, we have to change the artwork,' so suddenly, through no fault of our own, you've got a huge gap. ... or somebody says, 'well, the run length was 100,000 but I actually need 200,000.' You've got to get paper, and you've got to get that job in. Or you've got all your clients say, 'I need the job for the 10 November.' Suddenly you think, 'how am I going to do that?' Do you part run stuff, to give them a supply if they've got a mailing that has to go out? So the flexibility in what we do as a traditional printer, and maintaining capacity, is reasonably tough.

Although changes to schedules are generally caused by customers, it nonetheless becomes the printer's problem to manage the change in a way which still meets the customers' deadlines, which are generally invariant. Overcapacity in the marketplace means the printer simply has to meet the deadlines.

But in the commercial general print marketplace there is pretty serious over-capacity. So I can't bully you and say, 'sorry sunshine - you didn't get your job here. We're now not going to deliver it until Tuesday week' because that will be the last job I'll do for you. So it's my job to make that happen.

There are also, however, many problems that can arise in the process of printing which also cause scheduling problems.

So it's fairly tough. Anything can go wrong. You get a job on press, and find there's a problem with the paper. There can be a flaw in the paper that's undetectable to the naked eye. ... It might be full of static and the sheets won't feed. Or it might be that there's a fault on the coating - the paper has a coating - and that suddenly you get tramlines through everything, and you think 'what's that?' So you've got to stop the press, take the job off, make it ready for another job, get another job on, while that problem is sorted out.

So there's lots of things. We do have machine breakdowns. Press can be trunking along, you've done preventative maintenance, and something happens. Something - the air compressor inside blows out. And you think 'wow! how could that happen?' But it does, and you've got to get engineers out - you've got to get it fixed. You've got to get it back up to speed and running. You might have lost eight hours and you might be at capacity, but you've got to find eight hours. Which isn't so easy.

Printers cope by switching jobs in their schedules, by building in extra time to their time estimates and by using Sundays and overtime.

The time that that actual job has taken to produce in the factory is a lot less than we allocate for it. If every customer insisted on it being done in that time we'd never be able to cope.

A: We build in quite a lot of leeway in order to (1) to accommodate the number of jobs we have in the factory and (2) to accommodate the fact that many of them will run late.... B: They come in two days late and they generally go out on time. Now you couldn't do that if you had shorter schedules and everyone hitting at the same time.

We have a certain amount of flexibility due to overtime working, so we know that we can usually get out of most situations if we put a call in for extra overtime. We have night shifts too. They're flexible too.

Last resorts are to outsource to trusted fellow printers, or to use flexibility elsewhere in the plant at a reduced profit:

So I, for instance, might have scheduled your job to go on say, it may be a two colour job and it may cost effectively go on a two colour press, but because the other customers for that two colour press messed us about so badly, we now don't have any capacity on the two colour

press. So I have to be able to say 'we don't care what the cost is; we just want to keep that customer happy. We'll put it on a four colour press.' In spite of the fact that that is the least economic option available, it is only customer service option available, therefore, we will do it.

We ring up other printers. They do the same to us. But if you're trying to delivery quality and service and all of that stuff, you can't mess around with that too much. I can't go into the dot.coms and say 'find me some four-colour capacity by tomorrow afternoon' because I don't know who the hell they are: risk avoidance again and surprise avoidance.

Having said the presses now need to work 24 hours a day, six days a week, the shock absorber is Sunday. Or it's outsourcing it, and that's what we do from time to time. So we have trusted fellow printers who we call.

The management of these schedules, as is generally done manually, by choice. This is because the problem is perceived to be too complex to automate. Many of the considerations involve subjective knowledge and assessments. These are simply more easy to work in manually.

We juggle it around a bit and when it really goes close to the wire, it goes on Excel spreadsheets, and start juggling on a spreadsheet. It's complicated, and it's the sort of thing that you could possibly automate if you like, but the problem with that is you'd have to feed every piece of information you knew into it and the feeding of all the information would take longer than the mental tricks you do to arrive at what you can get away with.

We actually run a manual production board and the reason for that is because it is so dynamic. And someone could say, 'that job actually, the artwork's gone late. The designers haven't got it ready. It's gone back two days.' It's visual. People can see it and understand it. Now we have the ability to run that electronically. We're not there yet, because it's so dynamic.

4.2 Management of changing workflows: print management agencies

Changing schedules are no less a problem for print management agencies.

… you have to keep that production capacity pre-booked. And if you're not doing that you will lose the slot and it could be that the next cycle is three or four weeks away, so you're constantly trying to keep up to date with the whole process.

It does then become our problem, because then they'll say, 'OK fine, when can you do it for? when's the best? because we really need it by Wednesday.' And then there's a whole round of phone calls or e-mails to manufacturing again, to say, 'hey, look, we're all under pressure. I know you can't do it for three weeks, but we need it in a week, and, you know, there you go.'

There will be a production board in the printer's. In any one day, depending on the size of that printer, he will have anything from three to maybe a dozen jobs for different clients going through. It's not to say there aren't problems being suffered on other projects - nothing to do with us. Delays. So actually although we've lost our slot this morning, there's one this afternoon. Because of a delay that has occurred on a totally different job with another client, we've got a slot. So sometimes we can cure the problem as easily as that. And really that's almost unnoticeable to our client. The fact that it happened this afternoon and not this morning is neither here nor there. That's best case scenario. Worst case scenario, yes, we have to find another printer.

4.3 Communications errors

In any project, clear unambiguous communication and accurate interpretation of meaning are important, and when many different people and organisations are involved, it's easy to see how possibilities for misunderstandings may arise. This is true even when content or workflow changes don't occur.

Misinterpretation of communication is a common, everyday occurrence. One agency has found that a return to elemental communication at the outset of every print project is a fundamental and essential stage that prevents some problems from occurring later on.

> *...miscommunication between the customer and the agencies, and between agencies. There's always a risk because of language differences, and because of different perceptions about the meaning of words. A customer will say I need a red apple. The agency understands the apple is red and pink and the further you go in the chain, the more complex or the more confused the message can get. So one of the things that account mangers and project managers do all the time is feedback. To prevent people from making assumptions.*

> *There is a lot of ambiguity in the print industry. It's notorious for that. You have to be very careful with that too, because things are lost in translation.*

As changes to a workflow occur, further possibilities for error arise:

> *whilst you can give manufacturing an instruction to say 'hold on that, and only go on this piece,' are they really understanding 'hold on that and only go on this piece,' or are they thinking the whole project is on hold? ... some of these projects in manufacture, if they've gone through the process a dozen times, all of a sudden they've lost interest in it. And all they see is the word 'hold' and 'well oh fine forget it,' then when you phone them up and say 'where's the job?' they'll say, 'oh I though it was put on hold three weeks ago.' And that happens, believe me, that happens.*

Communication errors can result from misinterpretation of what is communicated, but error and uncertainty also arises as a result of the communication choices people are now able to make. There are now so many different ways of communicating with people, that that itself has resulted in less systematic ways of communicating. This can mean more confusion about what other people in the workflow know, and the history of the content emailed to you. For example, who has seen it before you and who has approved it?

> *If someone sends you an ad straight to your desk, and you're the one who needs to use it, does the publisher know it's there, do the people who are looking after the job in the factory know it's there? How do they know what it looks like, where it's got to go? Whereas before someone would put it on a disc, for example, and send you copy instructions to make this up and all the instructions would be clear and it would go through a set process. Now all that's gone out the window, because they can deliver that right to the exact place it's got to be.*

> *The publisher might not even know that ad's arrived that day. You hope that there's communication going on elsewhere, but you don't know. That's where I think really is the problem with all this is.*

In addition, thanks to email, communications are a lot quicker these days, but there are also a lot more separate communications to deal with resulting in management and recall problems.

> *... you get e-mail, and I hear it day in, day out. People saying 'oh yes, I got your e-mail and read it - oh did I read it? I can't remember. I don't know - I'll have to go back and have a look.' Now that's a real worry, isn't it?*

5   Current use of digital printing

5.1   Digital printers

Digital printing is of limited use today because it is restricted to fairly standard outputs and limit the choice of different shapes and sizes of paper, and different finishes to them.

There is only so much that digital printers can do today. It will come, but if you want an odd size today you'll have get your print done on whatever format the printer can handle and then send your stuff to a finishing house that will cut and shape. So at the end of the day, if you look at cost and time, it may not necessarily be the best solution.

And, of course, it only suits small pagination, small run products because that's the only end of the digital printing market at the moment that's catered for. The moment it gets into larger format presses is when it will really open up the market, to a complete digital workflow right through to printing.

Some printers have digital printers at the moment, but are not able to capitalise upon them yet, or the benefits in some cases are yet to be realised.

We're much more advanced than a lot of companies that still deal with film. ... They may have a computer to play with in the corner but in fact what you actually find is that 80% of what they do is still done on film.

Any progressive printer will have a digital press in the corner of the factory at the moment. It won't be making them any money; they will be losing money at it, probably, but they will be able to support it because of the rest of their operation. In fact, we read in last week's Print Week, that one of the larger print groups, Wheatons in Exeter, closed down their digital print workshop, and they're not the first.

With our new digital printer, we could publish that printer on the Internet, someone could download a file to it and print a job automatically. But the infrastructure for making that happen around it, is just not there today or it has to be greatly simplified; it's just too complicated.

At the moment on these A3 presses - a typical brochure for a digital press would be 4 pages. Four A4 pages up to 500-700 copies. Very good, very cost effective. You can almost get it printed overnight. Superb. But the moment the pagination starts to increase, and the quantity required starts to increase, digital can't live with traditional litho. So there you've got a break in the process, where this digital process stops and the actual job gets produced on traditional mechanical printing presses.

We just put in a Xerox Docucolour 2060 digital press. This is going to be first used as a proofing device but we also think we might get into short run digital print and possibly some variable print. We foresee a situation where [our customers will] start to use variable print in order to make themselves more attractive ...

5.2   Print on demand

Print-on-demand, which is often interpreted as 'digital printing' is not necessarily perceived as isomorphic with it at the moment. Currently conventional printing presses are more appropriate for some jobs - long print runs or non standard formats - because unit cost is lower with longer print runs.

With the technology that we have today, if you digitally print your, say, six page glossy brochure it's going to cost you a fortune, and you won't even have the possibility of finishing it as you need. So, in that case, print on demand becomes traditional offset printing, where thanks to your quantity, you'll be able to get a price which is still going to be more competitive than digital printing and you can finish your piece as you like, and you can distribute it just in time, in just the quantity that has been ordered for that particular need.

... printing on demand is basically understanding exactly what the need is and addressing the need in the best way for that specific need. It's not necessarily always digital printing. If you're talking about producing 5,000 or 10,000 units I'm not sure that digital printing will be the best answer.

6   Technology issues

Some of the printers who deal directly with customers have noticed an acceleration in the uptake of digital technologies in the last year or so. In some cases upwards of 70% of their incoming work is now digital. This section deals with some of the issues that are arising as a result of the trend towards digital workflows.

> *What has grown quite significantly in the last twelve months, six months probably, is us receiving work via the Internet. Before it was pretty much communication over a telephone line but with specialist software at each end to send and receive the files. What we found was there was a huge growth in communications with us, with e-mail and with work attached to e-mail, which gave us a lot of problems. The whole e-mail side of things just couldn't support the file sizes and the amount of work that would need to be shifted from one place to another to do our job. So what's happened now is that you have ISP services. These are people that have some very clever software that sits on the Internet structure, either using dedicated lines, leased lines or just an ordinary dial up, that you can send work via, and that's been a massive growth in the last six months.*

6.1   Proofing

Proofing is currently the point in the production process where the digital workflow breaks down. One of the most significant obstacles to digital proofing is the current lack of an industry standard for maintaining colour fidelity between different colour representation systems (CMYK and RGB) and different output devices.

> *Nearly all our new business is PDF workflow anyway. ... We can now much more quickly deliver the job to the press because of that. But the big thing that slows it down is proofing.*
>
> *I think at the higher quality end the market, there's still nervousness about using digital proofs to sign off on. ... I think everybody accepts that on the screen you're looking at an image in RGB, and then that has to convert to CMYK for printing. And there are at the moment still fundamental differences in that.*

Digital colour management is a significant problem area for printers, and in some respects is becoming more difficult as a result of greater variety of printing substrates at the high end of the market.

> *...maybe mailing a household brand, and you know how protective they are and rightly so of these brands. And that colour has to be not one iota to the left or the right, it has to be exact. We have experience where digital proofing has accomplished that. It depends on the colour. Other times, no, and we've maybe gone to as many as 3, 4, 5 or even 6 digital proofs, and amending constantly in between, because the client has not been happy with the colour. You would never expect to do that many with a traditional wet proof. You would always expect to get that right second time, or probably first time.*
>
> *It's problems with colour matching primarily, but there have also been instances where the material it's been proofed on is completely different stock to what it's being printed on, and then all of a sudden it's 'that wasn't like the proof' and no-one actually remembered that bit. So for this sort of thing at the high end of the market, it generally is ink on actual paper, and invariably it's printed on the actual machine so you're getting a real life proof. ... That's a point worth making actually, because manufacturers are getting even more creative in the types of stocks, different textures, surfaces, colours they're producing; they're expensive papers, but they tend to be papers that lend themselves to this quality, bespoke end of the market ... from a digital proofing point of view it's easier to calibrate things to accommodate things for a much narrower field of substrates.*

The large corporations were described as those most concerned about colour fidelity, and there are other sectors where it is not so much of an issue:

> *There's a lot of stuff that we deal with as well which is outside this market. Well quite frankly you can give them a proof and as long as it sort of looks all right for colour and it's right for copy, and you're going to print it on a white sheet of paper, then that's good enough.*

Lack of technical sophistication means print buyers (maybe all the way to the company's board) often don't understand the relative nature of colour: they expect the appearance of a file to be the same whether it is displayed on different monitors or printed through different machines.

> *...the depth of understanding of colour management in our customers is zero. Absolutely zero. I mean if we can't get PDFs through to them, then we're not going to get into colour management issues with them. And they are complicated.*

> *If we were presenting to a PLC board about an annual report, those people do not, they cannot be expected to understand that a digital proof may look slightly different to the final print job. We can understand those differences because we're dealing in it daily, these people can't, so again it goes back to 'well, if you're telling me a digital proof isn't actually what I'm going to see at the end of the day, then I don't want to sign off the digital proof, I actually want the ink on paper.'*

The lack of colour fidelity certainty is one of the things that is holding up digital proofing, and having to do proofs in more traditional ways is comparatively slower and more expensive.

> *But that's what manufacturers are working on, ICC profiles. And that's a way around proofing problems. What we're trying to do is to reduce communication times, paperwork, having things put in the post. If you're going to have digital, then* everything *has to be digital, including the paperwork. It has to be. Otherwise it just won't work and you can't even start to have people coming into your website and using different facilities that you offer on your website.*

> *Even if it runs electronically you still have to do an electronic proof, but a hard proof for the client. Show that proof to the client, the client would then make amends, we'd take it back, make amends, run out new films, new proof. You'd actually get an account manager to take it into the client and say 'is this what you want?' Now that is fairly convoluted, and also quite cost prohibitive, because you're paying either for couriers overnight or for an account manager to actually take that proof to the client. You will want the designer to see it, the client to see it, either the marketeer or the end purchaser. If the client's a financial services sector company, they'll want compliance and legal departments to see it before it's signed off. So in other words you can imagine, this proof goes round a huge process.*

6.2   Electronic files, PDFs and the shift of responsibility

When customers are disappointed with the quality of content they have created themselves (e.g. their own scanning), there are questions over responsibility. Receiving content in electronic form has muddied the water somewhat, when considering who has the responsibility for the content. If content is sent to a printer, who has to carry out some transformations on it (such as to a new file format, or conversion from RGB to CMYK) then it is arguable who is responsible if the print buying organisation isn't happy with the result. It is expensive in time and money for the printers to assume responsibility; yet on the other hand, the print buying organisation often doesn't have the experience to understand the technical issues which cause these problems.

If the file has not been originated [here], then it's difficult for us to take responsibility for it. But we have a service we offer to our customers, and we are the experts and therefore - you have to know your customer.

They were getting more and more frustrated with sending us work that looked fine at their stage and by the time we printed it it went wrong, so it's been a huge shift of responsibilities towards the customer and some take it well and some don't.

If printing is going to be cheaper, the customer has to take on the responsibilities of preparing those PDF pages correctly and making sure what he gives us is what he's going to get back. We will do some checking en route, but it will be limited, and there may or not be another proofing stage. So he'd better get it right before he sends it to us. That's quite a mind shift for them. They haven't been used to that. They've usually been used to a printer tidying up their stuff after it's despatched to [the printers]*.*

The changing rôles printers and their customers are assuming as a result of new digital capabilities on both sides often means relationships, rôles and expectations and charges, have to be renegotiated.

It's a deal. We say to them look you're taking on this responsibility, but we have significantly reduced the price that we were charging you for that pre-press operation. That's the deal.

PDFs are one example of a technology which have made a major impression on the industry, particularly in the last year, when uptake has gathered momentum.

30% plus is now PDF and it's climbing. Some sections of the industry, the magazine boys, are much higher than that. PDF is creeping to 100%. A friend of mine in the magazine sector has just made four people redundant in pre-press organisation because there isn't anything for them to do anymore. PDF has taken their jobs away.

PDF has taken off because it has taken out a lot of the problems. Type problems, reflows of type, things missing on there that should be there - just the accuracy of the whole job from colour right through to content. Now with PDF, the content has been practically covered, if it's done correctly. There's still bad PDFs unfortunately.

That is one of the big advantages of the PDF workflow: we know that if we've got 'x' number of pages and it will take 'x' number of minutes or hours to process. Whereas previously, you could have a job in, and you could be half a shift trying to sort the file format out.

…… at least it's more obvious to them now though, where the responsibilities lie, when they send us a PDF. Whereas before, a lot of the frustration was if a job came in and you're having to phone up the customer and say 'this is wrong' or 'this is missing,' the chances are he wouldn't believe you. They'd say 'oh I'm sure I put that on the disc, I'm sure that's there'. We used to waste a huge amount of time.

[PDF] has happened big time for us. It was something we hardly knew about 15 months ago, but today 70% of our business comes to us as PDF. That has taken out an enormous amount of value out of our pre-press situation. We actually probably think it's an advantage because we were seldom able to charge for the amount of effort that we were putting in to put things right for customers and, of course, there's no doubt a PDF will flow through the workflow quite quickly and easily, so that it's a positive. ... That change has probably been faster than any other change we've seen in recent time in the printing business.

At the same time, however, PDFs are also perceived to be to be a two edged sword as some of the pre-press work no longer has to be done by the printers.

…they're sending you a file that anyone else could handle. So really, you're really kind of opening yourself up. Because you're not actually offering them quite the service you used to.

And so the danger is that they can send this to any printer and therefore if they want to save some money they could shop around and probably save themselves.

This is one of several reasons that printers are looking to 'value added services' as one way of enhancing their attractiveness relative to competitors. It isn't enough just to print well and on time (which is just basic good service): other offerings are required.

6.3 Creative or design agencies: the weak link

The resources of creative agencies are generally not equivalent to those of others in a given print procurement workflow (printers, print management agencies and print buying organisations). Agencies are chosen by the print buying organisation, and are often very small, maybe just a handful of people. Thus they cannot afford to invest in expensive new or upgraded equipment or product licences. They also tend not to invest in expensive, high bandwidth communications technologies. Although it would be in their interests for agencies to acquire these technologies, the incentive for printers and print management agencies to help fund them doesn't exist, since print buying organisations tend to change from one creative agency to another every few years. (This is because every few years they feel a new for new creative approaches – best found by changing agencies.)

6.4 Bandwidth

Bandwidth is a substantial problem. It is too expensive (ISDN) and too slow (FTP) for the large file sizes that are being transmitted. Lack of affordable bandwidth (in the UK) is something which is currently perceived as holding back progress in moving business to the digital age.

So one of the difficulties of accessing business via the web is the bandwidth and file sizes. Now I don't know what's going to happen with bandwidth, but at the moment it's effectively unusable for us to use. I mean we have an FTP site and stuff comes down it, but anything serious, and it's just not fast enough. So we're still back to ISDN type solutions..... it's a major issue.

... if you have enough money there is always a way to buy your bandwidth, but ... for us and for our customers it's a lot, so that's still something where you need solutions. If the bandwidth isn't there then you can't use it.

... we tried desperately to explain to BT that if they really wanted to seed the industry with VIO as a service, then they had to open it up to the people who control quite a lot of the content. Who are not going to be the people that could afford to spend lots of money to go on to VIO. Even very big spends of marketing resource, quite often a lot of the control of that is sitting in 8, 10 man design operations, who can't spend fifty grand on signing up to a high bandwidth. I tried to persuade them they should price that on a usage basis, not on a joining basis, but they wouldn't listen. So the net result of that is that it's not really done very much. We have no customers on it........ So we're stuck with dear old ISDN.

We don't want burned in CDs being sent through the post! And all we have is telephone lines.... it has to change and it's not changing fast enough, it really isn't. We're in the forefront and we want this. The printing industry, we're used to dealing with large files - even compressed, they're still big ... We need large bandwidth for large files, so we need a good communication system. But it's just miles away and I can't see any light at the end of the tunnel at the moment.

ISDN isn't an effective or economic option for printers (a situation they believe to be an artefact of BT's pricing structure).

We can still only receive one file at a time. So other customers ring up and say, 'I've been trying to get on to your ISDN.' So it's not effective unless you're going to pay to have eighty lines put in, and then for 93% of the time all of them are idle!

I think as a business we have some real issues with BT. They've ripped us off frankly. Some of the costs we're paying for ISDN lines and leased lines are crazy. We're paying through the nose for what in America would be a fraction of the cost.

Lack of bandwidth, and lack of information about where bandwidth technology is going is seen as a significant obstacle to the growth of digital workflows.

It was an interesting thing when BT came out with ISDN because that was their product. They made a commitment to put it in everywhere. ADSL they haven't, but why haven't they? Because ADSL is more important than ISDN. ... ADSL is the start of the bandwidth the company needs, but if we want to put all our telephones on it as well, then ADSL is not big enough. There needs to be something on from that. ... It's very difficult, you don't know if they're going to go fibre or copper. They talking about putting all their technology money into copper still. You don't know, it's very difficult and we'll be the last to find out really. So I think that is really really going to seriously affect everything in the future, certainly in the next five years.

One of the restrictions on where we go, may well be the ability of BT to deliver us a bandwidth at a decent price, and reliably.

I mean it may well be that eventually we will be delivering them a digital job, by e-mail or whatever. But I don't know. Certainly the way it stands at the moment it would have to be different from just sending them an e-mail as an attachment to a file. A lot of people can't, these files are quite large for the quality, and again the Internet infrastructure is not there for everybody in their homes. It's just not quick enough. Eventually it will be though.

6.5   Electronic job monitoring

It has been suggested [2] that one of the key benefits to print buyers of Internet mediated print buying is that buyers could monitor the progress of their job at the printers, and moreover that their desire for this will drive printers to making this information available.

Although some printers are building infrastructures to support this, there was also considerable scepticism from printers that this claim is valid. For example:

If anybody wants access to our production schedules they can do that via the web; nobody has actually expressed interest in doing that funnily enough. They just want to speak to somebody and say 'is it going to be here on Thursday?' They don't really want to get into the intricacies of our production loading system ...they just want to hear it's going to be here on Thursday.

Another printer was also dubious of the value of customer job monitoring: the constant schedule changes that are made would 'scare people to death.' A customer could see that his or her job had been moved to a later date: this is likely to be less reassuring than cause for concern that a job will meet its deadline, and is only likely to give rise to a phone call to find out the story behind the change and get the appropriate reassurance.

In some cases printers feel job monitoring would not assist their customer relationships.

.. they like to believe that they are one of just a few customers you're dealing with ... they'd like to believe that they're rather special, that when their work comes in all our attention is turned to this one job! And we have to say 'well, come on, you're not the only person that we're dealing with today!' And that is a message which, given the nature of their work, I think

they would find rather difficult to accept. We'd rather not have to bring it home to them by showing them our production schedule and where their job is on that schedule.

7 Internet print brokers and print auction sites

Neither printers nor print management agencies felt that Internet auctions or brokers offered the sort of service that their owns customers sought. They offered a number of reasons:

It is contrary to the trend these days where corporations rationalise their supply base and work with a small number of highly vetted and continually benchmarked suppliers.

> *What we see, especially in today's market, is rationalisation of the supply base. ..... They get a job just on price, but really, then there's the problem of getting added to the list of suppliers to the host organisation, which actually increases the cost of administration and takes nothing out.*

Suppliers need vetting to check what contingencies they have for when things go wrong (are they just someone operating out of a garage?). Often a lot is dependent upon successful print projects, and customers will not wish to risk problems by using unknown and un-vetted printers from Internet auctions.

It reduces printing to a commodity, which it is not. It strips out customer service and is highly impersonal. This is not what customers want.

> *People don't want to have to go onto an auction site, and a printer they've never dealt with: the geography really isn't so important, but they might not understand the ethos and culture of that organisation.*
>
> *But really it's the relationship that's important because, when you're producing a product like this, it's a living, breathing thing, it's bespoke, it's tailor-made for every client, and every job is different. ……… So, as I say, we're not fans of auction sites, because I don't see them really delivering any long term value to anybody.*
>
> *We have high skilled, very highly paid, highly experienced customer service operation here, which is completely linked now with our commercial operation, because we perceive that to be the same thing... I'm pretty confident that the dot.coms can't replace that. Maybe there are some products of this industry that are commodities. Maybe they are things like letterheads and business cards, but it's been tried before in a non-dot.com environment.*

Customers need to be technically informed to use these sites; many print buyers are not.

> *If you want to take advantage of any of the existing tools you have to be an expert in printing.*
>
> *A customer finds it hard to visualise design if you talk in abstract terms. A customer will understand if he sees a sample. So if you're talking about an A5 folder folded six times or folded three times or double A3, he doesn't know what it is. You have to actually go there with the sample and 'this is what it is going to look like'. So imagine the customer having to know, and to fill in the information on whatever Internet based thing!*

Printers emphasised that they take 100% responsibility for their customers. Many of the Internet print auction/brokering sites take no responsibility for any of the many things that can go wrong in print.

> *But if you actually read their terms and conditions, it's horrific! They take zero responsibility for anything. They won't have anything to do with the printer that you've selected or that's on*

the online auctioning. If the printer goes bust - not their problem. If they don't deliver - not their problem. If the print buyer fails to pay the printer - not their problem. Well!

But the problem is, we know of examples where, if you look at customer satisfaction, then customer satisfaction is still relatively low, because there was no-one helping the customer when it turned out that the basic material he gave wasn't really fit to reproduce, so it was garbage in and garbage out. So it was 'listen, you gave me garbage, now you have a lot of garbage, but it's not our problem'.

The agencies and the printers both found it difficult to imagine what sort of companies would buy their print through web print sites, but thought that those wanting 'simple' or infrequent print jobs might use them.

I think they cater for that simpler end of the market where it's fairly straightforward and they can just put the supplier in touch with the buyer.

We find it extremely difficult to understand anybody buying print that way; it just doesn't make sense to us..... Maybe they're nibbling at the high street franchises.

I think where the Internet is going to score hugely is with people who put print placement as a very small part of their job because if they happen to be a marketing and communications officer for the Royal College of Nursing or something, but they also have to place the annual report, that probably would be just as effectively done on that kind of thing.

I think people just being able to go in and shop around and find the cheapest, I don't think that will apply to the bigger work that we're looking to print. Perhaps it will do for, say, if someone wants a few business cards.

However, one printer has found that customers use some Internet print sites to force their regular print supplier's prices down (and said that other printers he knows have had the same experience). The buyers submit jobs to the site with no intention of accepting quotes. They then use the cheapest quote to negotiate with their preferred suppliers, so in effect are using the Internet as a pricing system rather than participating in the Internet marketplace.

Some of our clients may use Select Printer or something to get a price for the project, and they'll then say to us, 'the price I have is in the region of X,' but they want their own suppliers with whom they have relationship and trust to do that job, so they use it as a pricing system basically.

As was mentioned earlier, overcapacity in the print marketplace is acting to push prices down, sometimes to below cost. This can be a false economy:

Just because they get a cheaper price doesn't necessarily mean, with the way the process works with corrections and changes in specification at last minute, that they are going to get the best deal.

8 Print, print management and workflow: technology needs

Printers and print management agencies see many ways in which computing technologies, if available, could increase their efficiency and effectiveness. The provision of workflow tools which cover the entire process of printing and publishing, from the inception of a project in the customer organisation all the way through to despatch of the finished product, is seen as a major commercial opportunity. Such tools would have to support integration with existing tools and applications, to support multimodal communication between partners in the process, and be flexible so that changes in the process can be accommodated. Ideally, workflow tools would also

support auditing capabilities, so that the information derived could be used to define continuing enhancements to efficiency and productivity.

In the following section, participants talk about some of the domains in which such a workflow could provide these benefits. The areas covered include automation of the process, content re-purposing, rationalising effort, error prevention, personalisation, change management, data analysis, auditing, security and integration with existing tools.

The absence of tools

In this section, participants talk of the lack of tools to give integrated support for managing the complex, multi-organisation project management process.

> *What isn't there yet necessarily, is the work flow that shows, if this is where I'm starting, and this is where I want to go, how am I going to manage that stream of work? How do I make sure that every step is building to guarantee that the end result is going to be exactly what my customer wants, at the time that he wants and for the price he wants? So that is the area that we are putting the most emphasis these days.*

> *You can get estimating packages, and management information services for once the job's in progress, but something that keeps all the plates spinning - there's nothing.*

> *There simply isn't anyone out there who is offering this degree of service. And obviously trying to find a package, a hosted managed solution that meets those needs isn't difficult. It's impossible. It just doesn't exist yet.*

> *What we need for the future is a tool or tools that can enable us to draw the process that makes it possible to go through all these stages and is flexible enough to address cost and changes that can happen anywhere, anytime in the overall process. Where our core customers focus on their competencies, the companies they choose to work with will ensure that the infrastructure is there and is properly managed. … Today while designing these kind of processes, we don't have any tools that can support us. We have tools for localisation, we have tools in content management. We have tools for on-line ordering and printing on demand, meaning digital printing for low quantities, and also offset printing depending on the quantity.*

> *There are a lot of manual steps in the available technology to manage and publish content, and there are* only *manual steps in the design and management of a project. There are tools that can help you manage the different steps but you have to design them. If we had tools to support every single step there would be some gains in time. The investment that you have to make though, to manage the infrastructure, may equal the time gain that you make unless you manage to go that one step further that covers the information supply chain from its origin. Basically, today on the market there is no service that is able to help a marketing person go through the whole workflow from defining the marketing objective ... to an execution plan that takes into account all the different single parts to it. And I do not have to be a specialist in content management, nor in localisation, nor in publishing to make it run. The workflow will have a link to the right partners who will know what to do.*

> *We're looking for tools to help us at the earliest possible stage to see whether things might go wrong. Tools which will help us to always communicate in a clear way, and preferably in the same way, so that it doesn't matter if person a or b does it. It would help us with flexibility, continuity, quality. Being in control is very important for us. We talk about time and quality and so on, but being in control of the process - that's key for us.*

> *We run a workflow solution currently. We do that actually on a live link basis, and that's linked into our electronic media library, so video clips, TV clips, radio clips, artworks, imagery. I think it won't be long before somebody invests enough time and money in it to come up with the right thing. They'll have a very marketable product there, so they'll get their money back and make money with it. So I don't think it will be long. We're already dipping our*

toes in looking at having a bespoke system. Which is crazy, because it would be far more cost effective for us to buy something that is 90% there and the 10% can actually be tailored and modified and adapted to suit our industry.

An automated workflow of the entire print fulfilment process

Currently my team and I are looking at a number of systems which will automate that entire process for us, so direct from client print request to payment invoice. Naturally, the savings they will return, on investment related to such a system, can be recovered very quickly, due to time saved, personnel saved, increased throughput and so on. A number of services we've looked at are totally web based; a managed hosted application, which provides a single interface to the site for each member of the chain.

… e-services, defined as a platform, or a way to offer workflow management tools might be one of these solutions. And if you can link that to content creation and management, and have a centralised workflow tool managing it, I think that we would get rid of a lot of communication errors. It's not only that; it's who's responsible for giving information, who has to read it, who has to comment on it, who did what and when, deadlines, and things like that.

Workflow and re-purposing content

Workflow is all about files and managing files, so file management is maybe even more important than a content management tool. There is not a content management tool at this moment in the marketplace that can deliver content management on all different output: on print and audio and video and digital printing and the web. There is a tool that can do the web and multimedia, there are many tools that can do web, there are a few tools that can do print, but there is no tool that can do print, web and multimedia.

Workflow and elimination of duplicated effort

What we don't want to do is we don't want to re-key all that damn information again. We want to be able to send it, as it is, as a complete job bag to the printer. And it will tell them the ink colours, the number of sheets, the waste factor, the speed we would run that job at, the number of sheets I expect on the floor, so production, slots of time, delivery instructions. Everything. Currently we have to re-key a lot of information because it's set for our MIS system. And they might be running a [different one]*.*

But anything we can do to smooth and take cost out of the process means that we will still make a bit of money and the client gets a good deal. For instance, what we'd want is actually for the data that our client has entered once anyway, to use that data right through the process. To convert that within workflow, from Word documents into Quark documents, which is recognised within the print and publishing industry. So a workflow that can handle conversions, and actually the data once input can route through the workflow.

We also want to be able to publish back within a workflow, electronic versions - masters. What we're also trying to get our clients down the line, is to using workflow to actually get designers to design a product once and then template it. Because otherwise what's happened in the past, is: large corporates have a favourite designer and the relationship is normally a very personal relationship, with no real structure to it, in terms of formality or agreements, copyright or so on. They'll come up with some creative ideas from the brief and every time the client wants to change it, they send it back to the designer, the designer rubs their hands, charges them another hefty fee and re-designs it. It's probably something as simple as a flash across that says 10% off this month or a promotional offer. Now what we see is, if we could find a workflow that was simple to operate, not too cost prohibitive, where that could route back into us centrally, we could do those amends very quickly within a template format, send it back electronically, sign it off, get the go-ahead. The purchase order routes its way down to us, we can then route it out through that same workflow to our key suppliers, such as paper, ink, consumables, storage, distribution and logistics. It really just routes straight out. So there's a

notification route, that tells people that yes the paper is coming, that actually tells our warehouse to expect it, that actually tells our production team electronically that that should now be brought forward in terms of production cycles, that actually tells our accounts people that we want to raise an invoice because we're about to produce the job, so get that ready. Because the way I see it is as soon as we deliver a job, I want to be able to send an invoice off, and I want to get paid. Likewise, I want to be able to pay our suppliers on time so that I can get the best deal.

Appropriate routing of appropriate information

It would also have to allow for some hierarchical structure. For example, there's no point in sending a whole workflow to a guy in the factory who is handling the packing and distribution of that product because you'd give them too much information. You also want to be able to disseminate that information at key paths: for example to say 'the weight of this product is 2.3 tons - it would fit into 148 boxes' and you want the calculation to be done for you.

Workflow, problem detection and error prevention

I think the same issues probably arise time and time again. You could actually form a programme that actually anticipates, maybe, or understands those elements. Especially when you're talking about working with designers, and client, and printer. In the past it's been very easy for everyone to point the finger of blame at everyone else and say 'well we didn't understand - you didn't tell me - you didn't give us the information and we had this, and we assumed that'. I think that the workflow community that actually took out the assumptions, and asked questions intelligently: this is the checklist at this stage of the workflow, almost like a pre-check flight check really that you could incorporate, I certainly see that as adding value.

But if we could have an intelligent workflow that would identify those [problems*]- a checklist for all areas, as it goes through, that would actually be very helpful, and I think that it would be something that would be very marketable as a product.

* examples of the problems alluded to might include: the artwork for a publication hasn't arrived by the deadline for printing a proof; a change is to be made to some of the content, which means the time scheduled for printing will have to be changed; the client has changed the size of the print run, so more consumables will now have to be ordered, and the printer's schedule will have to be changed.

...to co-ordinate things. You also get into a situation now where because of the loss of time everybody in the process is under a great deal of pressure. It obviously increases the risk of mistakes, things going wrong. I think that's the toughest thing to deal with. But then, just really making sure that everybody down the line, that we've all understood the changes and more importantly, those changes are getting signed off by the right people, the client.

... you have to allow for, and also have the ability somehow to launch from that workflow, to be able to send a text message, for argument's sake, out of hours, to somebody who's actually handling the production, to say, 'I need to talk to you. This is not e-mailable. I need to talk to you.' But you want, you know instead of the client having to key that in, what you want in a workflow is the panic button, 'please talk.' But a text message going over a mobile phone is absolutely fine, or sending an e-mail saying, 'please call me'.

Workflow and personalisation

We see a workflow that is personalised to each and every client has significant benefit, certainly to clients, certainly to us, because it maintains a relationship.

Workflow and management of change

If there was a workflow that actually said 'warning, warning, artwork late! Sorry, that job's late.' Then that triggers something else in the workflow to say to the supplier, 'sorry supplier, the job that we said you'd have tomorrow is actually going to be two days further on. Please adjust your schedule.'

If they can link workflows so that, if a client says to you, 'we want a reprint' or 'we asked you for half a million copies, but we've had such a great product launch that actually we now need a million copies; what is the cost implication and when can you do it?' That would be great if workflow could handle that: routed in and actually to collect data from our own database and MIS system, and route that back intelligently to the client, now that would be perfect.

Data analysis

That is a tool that might help us: where are the experts, the specialists in this area? Or, based on ten years' experience in marketing campaigns, would it be possible to define these campaigns by the media they used? In many cases we even know what the results [of the campaigns] *were. Would it possible to put that in a database and based on the criteria of a new campaign, to see what happened to other similar ones? And to learn where we might add something?*

Integration with existing MIS and ERP systems

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Workflow would probably have to integrate with the main providers of MIS systems to the print industry.

E-procurement of print consumables

And we see it as an area for other procurement, so things like consumables as ink, paper, plates, films, certainly those sort of areas where they can just be done electronically via e-commerce.

Workflow and resource management

We certainly see storage, distribution, intelligent picking and packing operations - where print once produced could actually be stored, and then distributed out. Automatic re-ordering, so from where it sits in distribution, I want, ideally, bar code readings, so it actually links back into the workflow and says Mr Client, Mr Print Manager, or Mr Printer, this is running at 'x' number of units per day, so the secure units are this, and we need to re-order if you're going to maintain supply. Because the system knows it takes three weeks to produce, once it gets to four weeks it should say 'we need to re-order,' and it then needs to tell production 'schedule this one in; it's going to come!' and then it needs to then tell the client, 'please Mr Client raise a purchase order', and that will come in, and it then needs to automatically route the purchase orders from the printer: 'I need paper.' 'I need ink' and 'I need production space'. And then it tells my finance department, 'we're going to raise an invoice in approximately 12 days,' so cash flow tells me 'that's fine'. … It would also tell my client that an invoice is going to come, and 'you should expect the invoice to be this'. And then tell the client if there's any changes to that during production. And when the invoice is processed, it ties in with the purchase order number, and despatch note, and any updates … give us back meaningful management information and data that we can feed back to the client within workflow reporting.

Workflow and auditing

And so if you had a workflow that could be interrogated by an audit department, to make sure that prices were right, to make sure the work was routing to those other approved suppliers, or one management team then took through the approved supplier route, you could start tracking it. Think what your audit costs would save. ... the type of clients that we are working with, they're big clients. They want to be able to go in, and look and check, and make sure that people are actually following the workflow, not bypassing it. And if people are continually bypassing it, they want a corporate hand to come down and slap them, and say 'this is not allowed.'

... give us back meaningful management information and data that we can feed back to the client within workflow reporting. Because that's also important. And I also would like a workflow to identify key performance indicators, whatever they may be, for our print suppliers, our paper suppliers and our client. So if the client says, 'you've had all our work' and I say, 'well, actually, we've done two hundred estimates for you, and I know to the penny what it cost me to raise an estimate, and we've converted 5%; that's not a very good ratio. I would say you're not a very good client.' So data like that being fed back, within a workflow. To route it back to the client, to actually say, 'hang on! Here's a preferred supplier; they're not getting our work, and we've got work that's leaching out of our organisation.' That does tend to happen. You have maverick procurement processes going on; we want to step that out and route it back into us. So a workflow that actually doesn't just go point-to-point, but actually recirculates back and gives the client information.

Workflow and security

The other thing that the workflow would have to consider I believe, especially now in terms of corporate security, is does it have the ability to go through a fire wall? what are the security implications? and what are the technicalities of breaching fire walls? i.e. how do you make it secure for that client, routing it back through suppliers? You can imagine, [a product launch for X] *where they've got a new product, they've got a new price structure, and they don't want their competitors to get anywhere near what they're doing. You want to be able to make sure that their data is secure and the workflow is secure. And that is of paramount importance.*

References

[1] http://www.bpif.org.uk/

[2] TrendWatch: Printers & the Internet: how the U.S. printing industry uses and plans to use the Internet. December 1999.

CAP Ventures (in its review of Seybold 1999) have identified three separate models which seem to be emerging in the Web based print management space.

Model 1: Targeted at the print buyer; a business to business print management service.

These sites provide a supply chain service that allows all the parties involved in the print process (e.g. buyers, brokers, agencies) to conduct their business used their browser based interface.

Model 2: Services sold to the print service provider.

Such companies provide the e-commerce infrastructure for printers. They don't act as an intermediate step between service providers and customers but act to provide solutions that increase the loyalty between customer and printer.

Model 3: Internet enabled print service providers and/or print brokers.

Companies which have developed their own internet-enabled order infrastructure and benefit from selling or brokering the print. Some are targeted at the SOHO market; others at large corporate accounts.