The Web and Evolving Business Models:
An Analysis of the Commercial Print Industry

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ABSTRACT

The Web and other digital technologies are bringing unprecedented changes to the ways in which enterprises carry out their business, and heightening the nature and degree of competition they face. This paper reports upon an interview-based survey which investigated changing business models in the commercial print industry. It explores the fundamental reasons some of these new Web-based models are failing. Key factors include the complex and highly changeable nature of print workflows: these mandate a high degree of human involvement, which failing Web-based models have excluded. It discusses some of the ways in which the adoption of different forms of digital technology is changing the customer-supplier relationship and introducing new uncertainties into it, and concludes with a discussion of the need for software to provide management support, in the broadest sense, for complex, changeable inter-organisational workflows.

KEYWORDS

The Web, commercial print industry, electronic marketplace, inter-enterprise workflow, human relationships, value net.

1. INTRODUCTION

The Web is one of the most significant factors currently causing enterprises to change the way they conduct their business. The Web is bringing a new degree of competitiveness to business-to-business (B2B) transactions, as enterprises have the opportunity to research markets extensively in pursuit of optimising the value of their purchases and securing a good product and service fit to their requirements. The need to provide good value while also cutting production and operational costs contributes to enterprises' decisions to restructure, outsourcing peripheral and supporting functions to specialist partner enterprises, and focusing on their core processes and competencies. Increased competitiveness requires enterprises not only to adopt new sorts of relationships with other companies with whom they trade, but also to re-appraise their fundamental business models: what value do they provide, how and to whom?

This paper reports upon an interview-based survey in the commercial print industry. Its focus was upon their current business environment, including the effects of the Web and digital technologies. Interviews were with the director plus either one or two employees, in three printing companies and four print management agencies. The headquarters of one agency were in Europe; the other agencies and all the printers were based in England. These firms deal mostly with medium sized, and national and multi-national companies, whose print 'projects' are, for the most part, characterised by their uniqueness and complexity. Interviews, in the autumn of 2000, were semi-structured, face-to-face and lasted between two and three hours.

The following sections open with a brief discussion of the changes in business models that digital technologies are provoking. In particular, one new business model, the Internet based e-marketplace is explored. This model has provided the inspiration for many new Web-based businesses and services in the print and in other industries. However, the print industry has characteristics and requirements which make it a poor candidate for the application of this business model. In particular, it is an industry which relies very

much on human contact. This and its other key features are described. An alternative business model, and requirements for workflow support are described in the last sections of the paper.

2.   THE CHANGING BUSINESS ENVIRONMENT

The current trend for companies to focus upon their core processes and outsource peripheral functions pre-dates the Web but is reinforced by it, as the Web increases competitive pressures (Alliance for Converging Technologies, 1999). The Web also fosters entirely new ways of conducting business (Frick, 1999). This means that enterprises have to be ever vigilant for threats to their business. This comes in many forms: in new business models and in competition from new and unexpected entrants to a business domain, from old and new competitors on a global scale, and from higher customer expectations for products and fulfilment. These all create the need for businesses to behave in new ways. The difficulty is that at this early stage of the Web's evolution, it is not always clear how enterprises should adapt for the new challenges they face.

Further, business models are still evolving, and so experience with what does and does not work is still being acquired. Bartels (2000), for example, point out that most Web ecommerce has not been carried out by on-line malls and 'dot com' virtual companies, as might have been predicted from early enthusiasm for them, but by click-&-mortar enterprises. Over 80% of these sales are ones that would have been made anyway: that is, they are made by established customers using the new sales channel.

There has been enthusiasm for the concept of the electronic marketplace. The open-sourcing B2B e-marketplace, in which many buyers and many sellers trade (E-Business magazine, 2000) is one type of marketplace, and enthusiasm for it is based upon the efficiencies and cost savings it is assumed to promote through competition. However, thus far these have had only a minor role in B2B transactions (Bartels, 2000). Some doubt has been cast on whether forcing purchasing costs down is the preferred way by which businesses seek to reduce their costs, as there is some evidence that businesses seek instead to reduce their operating and purchasing costs (Marn et al., 2000). In fact open-sourcing e-marketplaces seem to be best suited for spot purchasing and commodity goods rather than regular purchasing (Reilly et al., 2000).

In another sort of marketplace, many sellers compete to sell to one buyer (one-to-many). Many new Web-based enterprises have been launched in the last few years, on the assumption that print buying can and will increasingly be mediated through this sort of e-marketplace. In this model, a 'market maker' (Frick, 1999), who runs the site, provides a place where print buyers can place their print job descriptions and printers can submit bids for the work. The market-maker generally charges a service fee, such as an introduction fee or a transaction charge. This model makes some implicit assumptions about the way print buying works: for example, that print buyers can adequately specify print jobs through the medium of Web forms; that continuing relationships between print-buying and print providing organisations are not needed; and that human interaction more generally can be dispensed with in the process of print purchasing. In the following sections, the validity of these assumptions is examined.

3.   THE UK PRINT INDUSTRY

The print industry is part of the sixth largest of the UK's twenty three manufacturing sectors (British Printing Industries Federation, 2001). It employs over 170,000 people in more than 12,000 companies, most of which employed fewer than fifty people. The value of sales is about £13 billion, 1.7% of the UK's GDP. The largest sector currently in terms of sales revenue is advertising literature.

The (UK) print marketplace is currently strongly influenced by two factors. First, by the very high capital costs of printing presses and other equipment. Second, there is more capability to print than is used. High capital costs mean that for the printer to make a return on investment, printing equipment must be run 6-7 days a week, 24 hours a day. However, over-capacity results in a fiercely competitive business environment, which drives down prices. This exacerbates the first problem of achieving an adequate return on investment.

3.1 The management of corporate printing

Most enterprises need to produce printed literature to support their products and/or services. These range from advertising and promotional brochures to manuals and guarantee forms. The process of managing the printing of companies' literature used, for the most part, to be carried out in-house, by specialist print buyers. This is changing. Print is an example of a function which many companies no longer perceive to be part of their core business functions. Accordingly, many have already outsourced the management of their print requirements to organisations known as print management agencies, or in some cases, to printers themselves.

Print management agencies work with people (often marketing specialists) in these outsourcing companies and take responsibility for the entire print 'project'. The agency will liaise with the company's design agency, and may also be required to manage and coordinate translation, content management for different countries, printing, storage, distribution and re-printing, according to the needs of the project.

Printing is a complex process and print buying requires a high degree of technical knowledge. Companies and their design agencies often lack this expertise. For example, the print management agency may have to modify artistic plans drawn up by the design agency, who, through lack of technical print knowledge, have proposed, in the words of one print management agency, 'expensive, or beautiful, but unworkable designs' (colours, for example, do not look the same on all papers, and correct colour reproduction may be a key requirement). One printer summed it up:

> "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 it increasingly a less highly skilled operation. Our customer service 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, emailing customers, PDFing back to customers, saying 'do you really want to do this? because it's going to go pear-shaped if you do …' "

3.2 Changeable work schedules

A print management agency will draw up a schedule detailing the different stages in the lifecycle of a print project (e.g. content determination and design, language translations, first and subsequent proofings, print dates and so on). However, change to planned schedules is common: in fact, in the printing industry, the maxim is, in the words of one printer, that "change is the norm and not the exception". Many changes occur at the content design stage, and design can take a lot longer than planned for. More changes occur at the proofing stage, not necessarily because of errors, but often as a result of unpredictable dissatisfaction with detail within the customer organisation. Agencies and printers alike have to plan for changes to the agreed schedule. One printer estimated that at least 50-60% of their jobs change their schedules, although customer segments differ: "financial services are like clockwork, but marketing people are all over the place."

Printers have to devote a lot of their time to changing their schedules, with the twin goals of meeting all customers' deadlines and optimising the use of their printing presses and finishing machines, which may include guillotines, folding machines, staplers, laminators and packagers. This is crucial for them, but is far from easy:

> "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."

> "You've mapped your week...and suddenly someone says 'we have to change the artwork,' so through no fault of your own, you've got a huge gap…Or somebody says, 'well, the run length was 100,000, but actually, now I need 200,000.' You've got to get extra materials in. You've got to fit that job in. Or you've got *all* your clients say, 'I need the job for the 10 November.' You think, 'how am I going to do that?'"

Although delays are often caused by the customer, it becomes the agency or printer's problem to produce the work by the customer's original deadline. This is because otherwise the relationship with the customer may suffer, something that cannot be risked in today's competitive environment.

4. WEB MARKET-MAKERS

One implicit assumption of the e-marketplace model is that relationships do not matter, perhaps because print is perceived to be a commodity, and so support for relationships is not provided. Buyers and sellers are simply put in touch, and the market-makers often do not vet the print sellers, or assume responsibility if things go wrong.

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

There was no evidence in this survey that relationships between print buyers and print suppliers are no longer significant. Although the Internet is causing major changes to occur within the industry, it is in other ways than reducing the need for relationships, a need which remains strong. It was frequently reiterated that customers want to meet, want to deal with the same person within an organisation, want reassurance on a project in progress, and want 'to feel that their job is more important than the others'. In the words of one of the printers:

> "We are effectively very close to our customers. We are often on site with our customers, working like colleagues with our customers. 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."

The factors behind the continuing importance of direct relationships are explored below.

5. THE NEEDS FOR AND BENEFITS OF B2B RELATIONSHIPS

5.1 Trust and risk reduction

One reason for the preference for personal contact at many levels is to enable potential business partners to develop shared trust. Many Web print market-makers seem implicitly to assume that reducing costs is the prime motivator which would encourage print buyers to substitute transactions with trusted suppliers for those with new providers. This assumption was not supported by participants in this study, and has not been supported by other work (Marn et al., 2000). A history of successful interactions with business partners, and the consequent confidence that that imbues is worth far more than cheaper job quotes. For the print provider, it includes confidence that investments made in providing quotes will pay off a reasonable proportion of the time, that customers will pay, and that they do not waste the printer's time with unreasonable changes and amendments, causing havoc to complex schedules. For the customer, it includes confidence that job quotes are realistic, that deadlines will be met, that the work is of high quality, and that problems will be responded to appropriately. The Web market-makers' lack of guarantee leaves customers faced with too much uncertainty. It is important that their limited and often decreasing marketing budgets are well spent, and they are unwilling to take risks. Printing is a process in which much can, and does, go wrong, and consequently both supplier and customer need the relationship. It provides the context within which service suppliers can know on an intuitive level when problems are about to occur. It allows them to use background knowledge about their customers, which prompts them to make a pre-emptive 'phone call "just to check". Mistakes are often avoided this way to the benefit of both parties.

> "This is fairly important 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 go to auctions on the web to produce this, because it is too important."

Printers also prefer to rely on their relationship networks when they need to outsource their own work rather than to find a printer via an e-marketplace. This is because their own reputation will suffer if anything goes wrong. Outsourcing at all is a risk, and one they would prefer to minimise through using a known and trusted competitor.

> "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."

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5.2   Operational efficiencies and cost cutting

There are many other business reasons companies wish to maintain direct relationships with those with whom they trade. Long term trading associations between companies allow them to achieve operational efficiencies and cost savings by developing common workflows. They may also develop innovative ways to share costs and benefits. An example cited by one printer was the networking and sharing by a group of printers of a very expensive item of equipment.

Costs reductions can come from other facets of long term relationships. Print suppliers learn from their customers what their needs are and are able to improve their processes to meet those needs: some go as far as trading on a specialty in printing or print managing which particularly suits a class of customer (e.g. printing for high technology companies: the requirements for this sector are different from, say, those of the automotive industry, because of the much shorter product life-cycles). For example:

"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."

One of the largest print management agencies interviewed said that one of many reasons they would not use a Web market-maker to find a printer is because of the costs of doing so. They are striving to reduce the number of suppliers with whom they work, as part of their comprehensive drive to reduce their operating costs. Adding new suppliers increases their administration costs; and one-off use is simply not economic. They noted that their customers, motivated by the same cost-cutting needs, operate similarly.

"What we see, especially in today's market, is rationalisation of the supply base. ….. The auctions 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."

5.3   Workflow predictability

Long term relationships also afford printers some predictability in their workloads. To the degree that repeat print jobs are required, they can forecast future workloads. In addition to this 'formal' knowledge, they also benefit from 'informal' knowledge. When companies come to know each others' processes, people and business partners, more accurate scoping of the work can be carried out. They are able to act upon their experiences of the company, and taking into account their idiosyncrasies, can produce more helpful work schedules than those produced by the customer. As two printers said:

"You'll say, 'Well, these people have been late pretty often; we'll assume they'll be late today. Therefore, we'll do this [re-scheduling] move here.'"

"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."

This sort of knowledge is also helpful to the print management agency in managing a complex network of suppliers. Changes early in a project affect the workflows downstream. They require communication with all parties affected by the changes, and can require adjustments to project schedules, changes to consumables orders, and sometimes changes of suppliers. When the partners in a transaction know each other, more realistic predictions of change and management of it are facilitated. As a print management agency observed: "We build in buttresses. We know our customers better than they know themselves!"

5.4   Intangible benefits

When a print project falls behind schedule, it is sometimes impossible for printers to make a new slot for it. They then need to find alternative suppliers who can meet the need. Relationships mean the reciprocation of favours. In this case, when it's possible, a friendly printer will take on another's work at short notice:

"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."

Printers are also more likely to do favours for long term customers. The ability to talk is also often crucial. Many problems do not have straightforward solutions, and need discussion:

"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 'you had a 50,000 run for the Motor Show. I'm afraid I will only give you 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'."

"As a company we feel that in everything 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."

6.   USE (ABUSE) OF E-MARKETPLACES

For all these reasons, printers, the agencies and their corporate customers still need relationships, and still need to talk. Printers and print management agencies could not say who would use Web print e-marketplaces (and indeed some of the young dot.com sites have already ceased trading). They speculated that perhaps print sites could be used for "simple and straightforward" work, such as company letter-headed stationery, business cards, or perhaps for work where brand identity was not a major factor (and hence slight variations in the colour of a company's logo, for example, could be tolerated). The customers of the printers and agencies of this study were described as having very specific requirements, and little if any tolerance for deviation from their specifications. A further obstacle is the degree of technical knowledge needed to specify a print job. Many companies now lack that knowledge, and many Web print sites assume some expertise.

However, there was suggestion that the print e-marketplaces are being exploited by both printers and their customers. They use the e-marketplaces as sources of information, but without any intention of trading there. Customers submit requests for quotes in order to find the cheapest quote for a given job. They then use this quote to return to their long-standing printer and negotiate a cheaper price. Printers submit quotes for particular jobs simply to learn more about how their prices compare with others that are offered there. They also use the e-marketplace as a source of new business. They attract a new customer with a loss-leading price, and hope to retain them for future profitable business, bypassing the e-marketplace.

7.   OTHER DIGITAL TECHNOLOGIES AND NEW ROLES

Digital technologies have contributed to many fundamental changes in practice in the printing industry. Some of the most significant of these include digital text and graphics (e.g. Adobe Acrobat Portable Document Format (PDF)), digital data transfer (through ISDN and digital networks), and computer-to-print capabilities. Content can be created and stay in digital form up to the point of printing.

This has brought great benefits to the industry, and will continue to do so in the form of integrated digital workflows; however, it also brings new problems. One of the latter is that the printer's pre-press checking used to be largely a visual process; now, however, potential problems, in the form of errors and inconsistencies, are not possible to detect visually as they are 'hidden' within digital files. In the words of one printer:

"…. you could receive one 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 who is supplying us with the work, it would come in at a standard rate."

It used to be clear that it was the printer's responsibility for ensuring that material would print correctly; now, however, the water have muddied. Printers observed that customers' inexperience with and lack of deep understanding of digital file formats results in many problems: for example, with page construction, graphics file formats or output device requirements. Are customers responsible for errors in the material they produce and send, or is it the printer's responsibility to check the customer's intentions and tidy up problems?

"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. Some take it well and some don't."

"We've got £50,000 scanners. The problem is, as part of the drive to force marketing department spends down, customers will very often purchase their own scanners. Because if we're charging £8 a scan and their scanner cost £500, then they think 'we're going to get our money back quick on this."

The fierce competitiveness of today's environment is combining with this to create new stresses. Customers expect to pay less, because they feel that digital files eliminate much of the pre-press work for which they used to pay. However, they still expect their work to be printed correctly. Thus there are areas of ambiguity in responsibility and in pricing. In the words of one printer though:

"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."

8. BUSINESS MODEL EVOLUTION IN COMMERCIAL PRINTING

As enterprises reduce their scope to their core functions, and with the many novelties and challenges of digital media and communications, printers and print management agencies alike are finding that they need to expand their service offerings beyond their core competencies. This is just the opposite of the business model promoted by the Web market-makers.

Print management agencies are finding that with the variety of media available today for advertising and promotional campaigns, they can gain competitive advantage by developing new services. For example, they can use their experience to offer consultancy on how to run marketing campaigns. What combination of media other than printed material should be used for maximum effect? CD-ROMs and a web site? In addition to printed material? Another example is to offer inventory management for clients, so that stocks of routine printed material (e.g. invoices and receipts) are replenished by them on a just-in-time basis, without the need for customer intervention.

Printers are finding it difficult to compete just on the basis of a quality product and service. Hence, they are looking for new ways of achieving competitive advantage. Some are already ahead of the mainstream and can offer fully digital workflows to the point of proofing. Some take this a step further and offer information technology consultancy, not only promoting the adoption of digital workflow technologies by their customers, but installing and supporting some software themselves. Some are building up digital image collections for use by customers. Others are moving into inventory management, storage and distribution, and in this way are offering new sources of competition to print management agencies.

Yet other printers and agencies are moving towards closer collaboration with partners chosen from their competitors and suppliers (printers, agencies, consumables suppliers, distributors and others). They aim to offer a complete service package based upon high degrees of collaboration and sharing between the partners, integrated high speed digital workflows, and customer-inspired value-added services. They are moving towards a new model of B2B collaboration that, through harnessing the power of the Web and other digital technologies, is highly responsive to customer need. It also capitalises on their customers' needs to outsource, but not to burden themselves as a result with a plethora of relationships to maintain.

9. OUR CONTINUING RESEARCH

These closer collaborations seem like much more appropriate business models in this industry than electronic marketplaces. The concept of closely knit B2B collaborations is one that has been gaining currency over the last decade or so, for example, in Bovet and Martha's book on "value nets" (Bovet and Martha, 2000). Some of the technology requirements to support a high degree of inter-enterprise process integration have been identified (Vollmer, 2000).

However, in an industry where workflow change is a given, inter-enterprise process integration is not so easy. In any one print project, new partners may be brought in or removed, orders of consumables revised, deadlines and equipment use re-scheduled, workflow documents revised and new deadlines and workflows

communicated. Change brings with it increased possibilities of error, such as failures of communication or misunderstandings, or people in different companies working from different versions of the same document. There are currently no inter-enterprise tools which cater for the complexity brought about by changing workflows, which support the entire product lifecycle, from initial concept to printing, distribution and re-ordering, and which also support the need for continued direct personal contact.

At the moment there are many separate types of software to support different activities conducting business generally (for example, managing customer relationships (CRM), managing enterprise resources (ERP), information management, costing and auditing). These and other packages do not share information readily within an organisation, and the problems of doing so multiply when such information needs to be shared across organisations in secure and robust ways, and consistent with value net principles. These types of packages often form the cornerstone of business management today, but there are many needs beyond them which are simply not addressed yet. Again, in the words of those in the industry :

"What we need for the future is a tool or tools that will 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 process. While 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 processes, we don't have any tools that can support us."

"What isn't there yet is the workflow 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 up to guarantee that the end result is going to be exactly what my customer wants, at the time that he wants and at the price he wants? So that is the area where we are putting the most emphasis these days."

"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."

"..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 approved suppliers, you could start tracking it. Think what costs your audit would save. … [our clients] want to be able to 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.'"

Our continuing research programme is researching the detailed requirements of complex and changeable inter-enterprise workflows in order to develop web-based software systems to support them.

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