Strategies for Successful Digital Printing

Thomas Mejtoft
STFI-Packforsk/Royal Institute of Technology

ABSTRACT Today the printing industry is fragmented and suffers from overcapacity, and printed material is regarded as commodity products. In this article, corporate strategy owing to the introduction of digital printing technology is studied. The focus is on companies that made digital printing investments. Differentiation is a strategic approach that is necessary for digital printing companies to compete successfully. The results show that vertical integration is a way to ensure appropriate supply to the digital printing unit and to add customer value to the service. Educating customers is a way to create a market for the value-added products of digital printing.

KEY WORDS: digital printing, business strategy, vertical integration, differentiation, customer value

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Traditionally, printing was the only output for spreading marketing messages and information to customers when referring to non-personal communication channels (Kotler et. al., 2005). During the later half of the 20th century radio and TV broadcasting became additional channels for reaching the audience. Since the mid-1990's, there has been a revolution with the global spreading of Internet and invention of the World Wide Web. Internet has during the last ten years taken the position as a dynamic and inexpensive way of publishing and distributing information. Printing houses are then no longer the obvious owners of the content, and print in general is now seen as just an output channel among others for those who are trying to reach an audience.

One of the drawbacks of printed communication has been the difficulty of achieving cost efficiency in smaller production volumes. The setting-up of a print run and the start-up of the printing press before quality copies can be produced have been work and time consuming. This perspective of printing, as only a mass communication medium, changed in 1993 when two relatively unknown companies – Indigo and Xeikon – introduced digital color printing with professional quality. They had at this time two different approaches to the technology, spanning from liquid toner and cut-sheet paper to dry toner and web paper. They both promised inexpensive short runs and possibilities of customization and variable data printing. Since the introduction of digital color printing, it has been forecasted to grow significantly but the definite break-through has yet failed to come.

Digital printing is a more flexible and easy-to-use technology than traditional printing technology, such as offset. The main difference is that every single copy from a digital press can be unique as there is no need for printing plates. This makes it possible to print customized material for use in e.g. one-to-one marketing (Peppers & Rogers, 1993). Another advantage in comparison to offset, that is mainly used for mass production, is the short changeover time and low discard volume, which makes it possible to shorten lead times and being able to print smaller editions. The technological development has been rapid, new and improved printing equipment and software are introduced one after another with enhancements in both speed and quality. Today the speed is high and the quality is comparable to print media produced using offset.

Digital printing affects several segments of the media industry by offering the possibility to output small editions to a competitive cost. This can be done for obvious applications like advertisements and direct mail, but also for traditionally large edition items like newspapers and books. Customization with customer name in direct mailing is an application that has been around for a long time. The development of new systems and more efficient workflows has made it possible to create more advanced personalized campaigns using advanced customer relationship management (CRM) systems. When a company is conducting a personalized campaign to a certain customer segment, digital printing raises the response frequency (Broudy & Romano, 1999) any may thus increase the competitiveness of the company.

Every company active in an industry is affected by its surroundings, which in turn makes up the competitive environment for the industry. Porter (1980) classifies five generic industrial environments when discussing driving forces of competition - fragmented, emerging, mature, declining, and global. The traditional printing industry is a mature industry, while the digital printing industry is a new industry that is still emerging as the volumes printed in digital printing are increasing.

Industry fragmentation is something that occurs when an industry has many players and consists mainly of small- and medium-sized companies. The consolidation level is generally low and no company or industry group has a significant market share and therefore cannot influence the outcome of the development of the industry (Porter, 1980). The printing industry is a fragmented industry (Gilboa, 2002), as approximately 90% of the printing companies worldwide employ less than 20 people (Kipphan, 2001).

The fast technological development is not only a fact in the printing industry but also in many parts of the graphic arts industry, which now all use digital workflows. This has introduced new possibilities in managing the value chain to cut costs and make workflows more effective. Technology is an important factor when determining the strategic path for a company as it is involved in the activities performed. The technology may change the rules of competition by increasing speed and lowering production cost or enabling a unique way of producing a product or service (Porter, 1985). This is what happened after the introduction of digital printing technology. Although the speed is far lower than for traditional printing technologies, digital printing has resulted in possibilities to produce as small series as one unique copy at a reasonable cost.

With changes in technology, first-mover advantages but also disadvantages appear. The advantages may involve reputation, switching cost and knowledge. The disadvantages occur because there are pioneering costs, uncertainty in the demand and early generation technology (Porter, 1985). The uncertainty about customer needs, most desirable products and most profitable technology may tend to lure companies into trying to provide all kinds of services and products. This is because they do not want to take the risk of making the wrong decision. However, this most often results in a lack of uniqueness and profits (Porter, 1996).

A commodity industry is an industry where the products are interchangeable between different producers. Over time, print media has become more or less a commodity product. This development has been accelerated by the increase in personal computers and the high quality home and office printers available today. Today it is possible to create simple print media without professional help.

Overcapacity of production and commoditization of products may result in fierce price competition among existing competitors in an industry when the products are not differentiated. These kinds of moves and countermoves in pricing may lead to overall sub-profitability, when an industry may be forced to compete primary on the basis of price. Overcapacity may arise due to the introduction of new or changed production technology. In some cases new production technology either focused on a niche or with a higher production capacity makes its way into the market while an old production technology is still left operating. This may cause overcapacity when there is an unbalance between production capacity and market demands (Porter, 1980).

The printing industry today has a widespread overcapacity (Birkenshaw, 2004). Old traditional printing technology is often still left operating, either side by side in the same company where digital printing technology has been acquired or it has been sold to another printing house. Since capacity expansion is something that usually remains for a long time, it is important to realize the potential consequences of expanding the capacity in an industry. In the printing industry the overcapacity has resulted in continuing price reductions (Birkenshaw, 2004).

Early research in cost of digital printing shows that there are few products that are economical to produce using digital printing technology (Bäck, 1997). During the last few years traditional printing technology has been developed to be able to produce shorter runs and digital printing to produce longer runs. However, by adding unique customer value to the product that cannot be produced by any other production technology available, digital printing can be an attractive production technology.

Objectives of the Study

The objective of this paper is to study changes in corporate strategy brought about by the introduction of digital printing technology. This research study focuses on companies in the graphic arts industry that have made digital printing investments. The study aims to analyze changes made by these companies to differentiate and find a suitable market to create market success.

THEORY

One central part in competitive strategy is to determine a company's position within its industry. According to Porter (1980), three generic strategic approaches can be adopted to create sustainable competitive advantages and outperform other companies in the industry - overall cost-leadership, differentiation and focus. Cost-leadership is gained by constructing an effective large-scale production facility, which can produce at costs that are far lower than those of the competitors. Companies that adopt a strategic position by differentiation have carved out a slice of an industry and are creating products that are perceived as being unique and therefore possible to sell at a higher price and also produce at a higher cost. The third strategy is to focus on a particular buyer group, product line or geographical area by serving this target well. A company that positions itself right may earn profitability even though the average rate of return for the industry in general is modest. It is said that a company that cannot develop its business in one of the above-mentioned directions is "stuck in the middle" and is in a strategically disadvantaged situation.

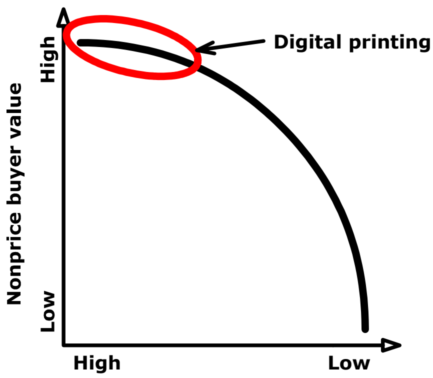
The cost-leadership strategy is often achieved by adopting a competitor-centered approach where benchmarking competitors is an important factor. Differentiation and focus often comes from a customer-centered approach where the customers needs are in focus when creating the appropriate services and activities and a non-price competition is possible since competition is mainly performed by product quality and perception of benefit to the customer (Day & Wensley, 1988). Differentiation most often implies a narrow product line that could become a problem for the company if the buyers need for the differentiating factor decreases (Porter, 1980).

Differentiation

When printing large series, digital printing is more costly per print than traditional printing techniques since the cost per print more or less remains the same throughout a print run. This fact makes it hard today for a digital printer to pursue cost leadership. However the possibilities with digital printing technology involves profitability in short print runs and customized variable data printing. This makes digital printing business more suitable for a strategic approach of differentiation or focus. By adopting one of these two strategies, it is possible to maintain a cost position that is relatively high and still be able to gain a customer base because the customer value delivered is higher than the cost leaders products.

The best practices follow something called the production frontier that states the relationship between the delivered nonprice customer value and the cost position of the production (Porter, 1996). Because digital printing has a higher cost position, the production frontier states the need for delivering additional customer value to be able to succeed with digital printing (Figure 1).

Figure 1: Position of Successful Digital Printing in the Relationship between Nonprice Customer Value and Cost Position



After Porter, 1996, p. 62

As mentioned before a company can differentiate itself from its competitors by being unique at creating something that is of value for the customer. This uniqueness does not necessarily come from creating a product that is unique but can come from anywhere in the value chain. Consequently, a successful differentiation can arise from other primary or support activities than the core activities in the company. So even though the actual product is a commodity product, support activities can make the final product differ substantially from its competitors (Porter, 1985).

The Industry Value System

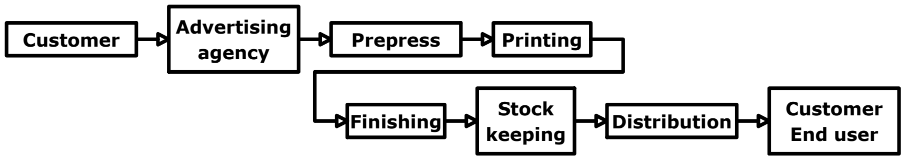
Added value is a concept that became very popular in the 1980's and Porter (1985, p. 39) defines it as ”selling price less the cost of raw materials”. A company is performing different types of activities that add value and these activities can be divided into primary and support activities, each important for what is called a value chain. A value chain can be used to understand the behavior of cost and the potential sources that can be used to gain competitive advantage.

Porter (1985, p. 36) also points out the importance of constructing the value chain on a company level and stress that “an industry- or sector wide value chain is too broad, because it may obscure important sources of competitive advantage”. However, it is also important to “understand not only the company's value chain but how the company fits in the overall value system” (p. 34).

Day and Wensley (1988) have a similar view but with a focus on the importance of having an approach of looking at the industry value system. Day states that a competitor-centered focus together with just looking at internal activities and costs may obscure opportunities gained by vertical linkages with other value chains in the industry value system. A value system can then describe how activities in different companies can interact to create value to a product or service (Porter, 1985).

The principal value system for print media (Kipphan, 2001) constitutes a good basis for understanding the different activities that are done to create, print and distribute print media. By analyzing the value system, it is possible to investigate the strategic path the printing companies have entered and to study their use of the value system to work with differentiation as a competitive strategy. In this paper, a slightly altered and simplified value system (Figure 2) will be used to be able to understand the general strategic changes in the digital printing industry.

Figure 2: Value System for the Printing Industry



In the value system, each individual step has its own value chain but in order to understand how to gain competitive advantage it is necessary to see how every part fits in the industry's overall value system (Porter, 1985). The linkage in this system is in other words a so-called vertical linkage that links different companies or different divisions value chains together.

Since the cost model for the digital printing technology is mainly based on low total cost on short-runs, it makes it possible to more or less eliminate the stock keeping of printed material since the basic idea is to print only necessary copies and to print them on-demand. This also eliminates or lowers the volume of a printed material that has to be discarded due to information that has become out of date before the material has been used. However, the activity regarding stock keeping in the value system for digital printing will still be kept to be able to illustrate how the industry works.

Vertical Integration

Vertical integration occurs when a company chooses to produce its own inputs or takes care of its own outputs, in order to increase that company's power in the marketplace (Porter, 1985). A company can then engage in backward or forward vertical integration into neighboring activities in the value system and make these activities strategic business units (SBU). Behind every decision regarding vertical integration, management has to ask the question whether products or services should be purchased from a partner or produced in-house. Vertical integration is an important part of corporate strategy since it is often one of first diversification strategies considered (Harrigan, 1985). The choice of a vertical strategy is often a reflection of long-term visions made by the company's founder or chief executive officer (CEO) (Beal & Yasai-Ardekani, 2000; Harrigan, 1985; Schein, 1983).

By engaging in vertical integration, a company can obtain competitive advantages. As identified by Harrigan (1984), a company may benefit from reduced costs by avoiding time-consuming tasks, improving coordination between activities, opportunities for differentiation of products and assuring supply. To gain end-user contact by integration is a way for a new product to penetrate a mature market since it is possible to show the products superiority (Harrigan, 1985). Vertical integration does also imply possible disadvantages such as increased internal cost and high exit barriers (D'Aveni & Ravenscraft, 1994; Harrigan, 1985). The distribution of profits and cost in the value system also becomes unclear when vertical integration becomes more common (Gadiesh & Gilbert, 1998).

The integration between activities does play a major role in strengthening the company's position and makes it possible to exploit some of the benefits gained by broadening the specific company's value chain or to form collations with other companies (Porter, 1985). The dimension of the vertical integration can differ depending on conscious or unconscious strategic decisions made in the company. These decisions regard the breadth of integrated activities, stages of integrated activities, degree of internal transfer and the form of ownership (Harrigan, 1984).

Previous research shows that a successful strategy may become legitimate in an industry and thereby adopted by other companies in the same field (DiMaggio & Powell, 1983). However, it is also stated that the condition of the industry is important for vertical integration to be advantageous or not (Chandler, 1962; Livesay & Porter, 1969), and vertical integration should be adjusted to changing conditions in the industry (Harrigan, 1986). A low degree of competition in the industry does in general favor vertical integration (Balakrishnan & Wernerfelt, 1986; Harrigan, 1983). A steady increase in demand does often imply more activities and stages that are integrated (Harrigan, 1985).

To be able to benefit from vertical integration it is important to take advantage of both existing knowledge and at the same time let new knowledge in the company evolve (Kazanjian & Drazin, 1987). However, the further away from the core business the vertical integration takes a company, the less likely the integration will be successful (Peyrefitte et al., 2002). This since the learning will be more complicated when new markets and process technology are introduced in the company (Kazanjian & Drazin, 1987).

METHODOLOGY

By utilizing a qualitative case study method, it is possible to gain deeper knowledge of the behavior behind the strategy used in a studied company (Bell, 1999). This study is an exploratory study, which is a study that aims to explore what really is happening and to seek new insights in the studied problem. There are three principal ways of conducting exploratory research: a search of literature, talking to experts in the field or conducting focus group interviews (Saunders el al., 2000). In this study, a literature review has been done and interviews have been conducted with respondents at a selected number of digital printing houses in Sweden.

To keep an explorative view of the study the concept with focused interviews was used (Robson, 2002). A couple of general questions were listed in advance to keep focus on some main topics and to be able to get comparable results from all of the respondents. This made the answers from the interviews more comprehensive when follow-up questions could be adjusted to the situation (Bell, 1999; Robson, 2002).

The interviews were all conducted at the printing house of each respondent during the summer and autumn of 2004. They were held under calm conditions without any major disturbance or time pressure (Bell, 1999). Additional information has been collected from annual financial reports and websites from the companies in the study.

Choice of Companies and Respondents

Companies from different stages in the print media value system have adopted digital printing, and therefore the companies studied have been selected to represent the following groups.

- Companies whose first major printing investment is in digital printing.
- Companies that have traditional printing equipment and choose to invest in digital printing as a complement.
- Companies that earlier had traditional printing equipment, but after investing in digital printing are phasing out the traditional printing equipment and making a transition into an all-digital printing house.

Previous research shows the importance of the founder and the CEO of an organization (Beal & Yasai-Ardekani, 2000; Harrigan, 1985; Schein, 1983). The business strategy and organization culture is often a direct reflection of the persons responsible for the business development in the organization. The leader in an organization is the one that should communicate the company's strategy to other co-workers in the organization (Porter, 1996). Due to this the CEO or the founder were interviewed at each company, as they are responsible for incorporating the business strategy among co-workers. Since most of the companies were small or medium sized companies the CEO in most cases was the founder or co-founder of the company. To gain deeper knowledge about certain aspects regarding the equipment and technology at the printing houses, additional co-workers were interviewed in some cases. Those persons were in someway responsible for the technological systems at the printing houses.

RESULTS OF THE CASE STUDIES

Company A

Company A is a typesetting company founded in the 1970's. During the 1980's, the company did not follow the trend with computers, which lead to a bankruptcy. The company was divided and reconstructed and has been working in its present form since the beginning of the 1990's. Their first investment in printing was a web-feed digital printing press in the mid 1990's. At this time, they did not feel that there was a market for digital printing. However, they had a belief that the market was going to increase, and felt that the investment had to be made to create the market.

At the time of investment Company A had a strong confidence in the business of variable data printing, but they soon realized that the technology at this time was not mature enough to produce more advanced variable data productions since only minor parts of the contents was possible to vary. Short lead-times were also an important factor and the possibility to have an all-digital workflow in the company.

The growth of the digital printing market has been much slower than Company A could imagine at the time of investment. Despite this problem, they managed to make a fast return of investment (ROI) for their first digital printing press and since then they have invested in two more web-fed xerographic presses. They state that they need more than one press to be able to ensure delivery times to customer in case of problems with the press.

Although the technology to produce variable data productions has developed, the market has not increased to any larger extent and is still only a small part of the total production in Company A. Today their business model is based on short runs and time critical jobs and they intentionally try to focus away from advertising agencies and try to work more and more with direct customers.

Company A was one of the first with digital printing in Sweden and they still want to be a pioneer. They try to stay ahead of competitors by continuously upgrading their digital presses thereby keeping their technological advantage.

The integration into printing from typesetting and prepress was a natural step since the company wanted to offer their customers more services. According to Company A, digital printing was a better option than offset since the digital printing market did not have the same overcapacity as the offset market had at the time.

In the beginning, they wanted to have subcontractors for finishing. Since this was becoming a weak link in the possibility to have short lead times, today they have all common finishing in-house.

Company A sees the overall price rivalry in printed material as the main competitor. This involves both offset printers and digital printers that sell below the actual cost.

They vary their production capacity by deregistering some of the presses temporarily, in this way they try to follow the market demands. In this way, they avoid unnecessary costs in service contract of presses that are currently in use. Company A believes that costs is an important factor and they try to be very cost-conscious.

Company B

Company B started in the early 1980's as a copy shop. During the last two decades the company has grown mainly by takeovers and acquisitions of both other companies and printing divisions of companies whose core business is not printing. In addition to the copy-shop, several offset presses were used in parallel with the digital printing equipment until the beginning of 2000 when the last offset press was phased out. Today Company B only has digital printing equipment since they believe that digital printing is more flexible. To be able to keep all customers they have allied themselves with another printing houses that have offset technology, this makes it possible for them to offer a complete solution for the customer.

The initial business model was based on the possibility to offer printed material with short lead times, and this is still a crucial factor. However small series are also becoming an essential part of their business model.

The ability to offer a complete solution to the customer is currently the main business model. To be able to support the business model with digital printing, Company B does not solely work with printing but also has incorporated a lot of other services as prepress, finishing, distribution and stock keeping of pre-printed material for printing financial statements, letters etc. Through this strategy, with offering of complete solutions and concepts, Company B can retain customer contact even though they turn to subcontractors when they do not have the necessary resources in-house. Today a large fraction of the revenues comes from support activities and not from the actual printing process.

Company B has made some efforts to sell variable printed material but even though they have both software and competence, they feel that the market is not ready. The production only consists of a few jobs per year that are true variable data printing.

According to Company B, offset printing houses are a strong competitor since today’s offset technology makes it possible to print shorter series and can thereby compete with digital printing in shorter series.

Company C

Company C was founded in the beginning of the 1990’s and the founders were persons with knowledge that made it possible to work with the whole chain from original to print. The growth has been organic to about 30 employees and even today most of the staff is trained to be able to handle the whole value chain in the company. Today they use both digital printing and offset printing in their production.

Their business model has always been based on working with the whole chain from customer to end-user and to offer a complete solution for their customers. Company C believes that digital printing is about flexibility and fast lead times and therefore the equipment, both digital and offset presses, solely consists of sheet fed presses since this increases flexibility.

The current business model is to be able to offer technological solutions that are ahead of the company’s competitors, their goal is to already be where “the market is in three years”. They try to ”give services and a possibilities to the customers that the rest of the market cannot offer”. Digital printing is growing considerably and Company C believes that there will be a 50-50 production between digital printing and offset in the next three years. Currently they are investing in order to satisfy this demand. Company C tries to keep up with the speed of the technological development if they feel that the technology has any market potential and can increase customer value. They think that they can take advantage of the new technology and feel that it is to their advantage that the graphic arts industry is relatively conservative regarding new technology.

Traditionally Company C has had a focus on customers that are international companies and work with different language versions of their printed material, but the investment in digital printing has broadened the customer bases since the number of customers have increased. Their main objective is to work increasingly directly towards the customers and not through advertising agencies. Company C believes that by creating simple solutions for the customer it is possible to increase the use of advanced digital printing applications like variable data printing. Although their small customers are mainly local and regional customers, the use of the Internet makes Company C "never further away than a mouse click".

As fast lead times are becoming more important, they have chosen to have common finishing equipment in-house. Company C believes that the knowledge among advertising agencies does not meet the requirements to be able to produce jobs suitable for digital printing. As Company C is trying to take advantage of the digital printing technology, they believe that the threat is if they "cannot make the advertising agencies to realize [the potential in the technology]".

By working directly with the customer it is possible to educate and show the real value and the real cost associated with digital printing. It is important to help a customer to realize how to make profits on a printed matter, "What is more interesting, what you can profit on the printed matter or what the costs is per copy?" By working with original work, Company C can both support the digital printing business model and reach a higher profitability.

Besides vertical integration, Company C has built other supporting activities like image databases that can be used both internally and sold as a service to others. This makes it possible to tie up their customer tighter to the company. By both vertical and horizontal integration the company can more efficiently tie the customer to the company and increase the switching cost.

Company D

Company D has a long tradition and was started in the beginning of the 1970's. The ownership has been the same since the start and their first business model was based on dyeline printing services towards the construction industry. They have always had the vision to be in the technological frontier and were very early with CAD service when the need appeared. They bought their first color copier in the middle of the 1980's and invested in their first digital web-fed color press in the mid

1990's. The same press is still in use today and has been complemented with a digital imaging press.

The potential and possibilities in variable printing was crucial for the digital printing investment to be carried through. Experience from the technological development in the computer area made Company D buy a top-of-the-line digital press with almost all extras that where available at the time. The press had an initial depreciation time of three years but is still running.

During the first period, there were severe problems with the press and Company D believed the time to be "a blood bath". Experiences from this time have made them wait to upgrade to a new press and they do not want a new press to cause as much problem as their old one did when it was new. Even though they do not currently have any need for additional printing capacity, they think that some interesting alternatives have finally appeared, and are planning to replace their web-fed digital press for a sheet fed press.

To be able to focus on print and fast delivery they have bought their own delivery service vans to ensure fast delivery in the local and regional area. Today they are specialized on printing and do not seek to handle the whole chain from client to customer. This is one reason that they have chosen to complement their digital press with a digital imaging press to be able to print larger jobs and not to loose customers and revenues. Although the press was bought on the idea of variable data printing, today Company D does not print any variable data jobs. Company D believes that the customer value of a variable data campaign has not yet reached the customers.

Company D believes that the unhealthy price trend in the industry is a problem. They believe that it is important to try to avoid this price competition.

Company E

Company E was started in the beginning of the 1900's and was a traditional printing house until the end of the 1990's. When investing in their first digital press, they phased out their offset presses and focused solely on digital printing.

Before engaging in digital printing, Company E investigated the market and expectations to be able to build a good business model for their digital printing investment. Variable data printing was a sector where they saw a big potential, "Well, we were fooled into believing the same falseness as everyone else, that variable data printing was just waiting to explode". After a short period they realized that the market was not ready and started selling other printing services than variable data printing to keep the press running and avoid bankruptcy.

Company E believes it is important to have good customer contact. They are seeking a business model where they can handle the whole chain from prepress to distribution. Although they do not have any original work today, they are working with other companies to provide original work that can suit their way of working with digital printing. Company E is focusing mainly on contact with the customer as a distribution company and do not only distribute their own printed material but also printed material and giveaways produced by other companies. They are focusing largely on complementary services and today over one third of the revenues are from other services than printing. Despite this effort over 60% of all prints produced on their printing presses are jobs where they act only as a printing house.

By information and education to the customer, Company E can support the marketing model of digital printing. By working with the customer and trying to show the actual cost for printing and handling of their printed material they are trying to show the customer the value of smaller series and customized material. Company E believes that digital printing is "a matter of selling customer value". They believe that it should be easy for the customer to make use of the benefits of digital printing and are currently working with different web-to-print solutions to support customization.

As the time from print to end user is a very crucial factor Company E keeps the number of sub contractors to a minimum and has integrated all services from print to end-user in the company.

They do not believe other digital printers to be a threat if they support the marketing model with digital printing with added value and do not print at a to low cost. Traditional printers are not a threat since they cannot create the same type of products and services as Company E can. They believe the real threat to be digital printers that do not realize the potential in the technology and chose to print to a price that is below the actual cost and by that contribute to declining profitability in the digital printing industry. Company E also believes that the current technological development is to rapid to be healthy for the industry since it is hard to follow all the new upgrades and improvements.

Company F

Company F was founded in the beginning of the 1980's as a distribution company. Approximately 10 years later a change of generations in the company resulted in a directional change and the company started working more with new technological solutions and computers. In the early 2000's they bought a digital printing press, this was their first investment in printing.

"Actually, the initial idea was mainly to do a lot of variable jobs" and the first calculation showed that the press should be profitable after two years. However problems with the sales function to realize what to sell resulted in low volumes on the press during the first period: "When it was installed, it was more or less a piece of furniture during the first year and a half". Based on these experiences they believe that for future investments, “it is extremely important to find out what the customer really wants and make investments based on that.”

To take advantage of the press Company F has changed their purpose for the press from variable data printing to short runs and on-demand printing. Most variable jobs concern postal addressing and not more advanced variable data productions. Since they do not have any prepress work in-house, Company F believes that they are dependent on variable data jobs from advertising agencies or from direct customers. Company F has discerned a trend towards less total amount of printed material and more on-demand mailing. This has led them to develop a system for electronic stock keeping of Acrobat files that are printed on demand in their digital press.

Currently Company F does not have any original work or prepress work but since the print ready files that are delivered by their customers do not always meet the necessary requirements, they help their customers to fix problems in the delivered files. This is a growing problem when more and more customers deliver directly to Company F and do not go through an advertising agency.

Finishing that is connected to distribution has always been a part of the company, however digital printing has made it necessary to include other types of finishing into the workflow. To avoid long lead times, they have chosen to have enough finishing to be able to handle fast deliveries when necessary.

They believe that ”color printing is just a complement to our other services” and that this integration into printing has not expanded the customer base to any large extent. They mainly use digital printing as a service to their existing customers.

DISCUSSION

Initial Problems

Opportunities for variable data printing was one of the main reasons why the respondents choose the digital printing business, but conscious and unconscious strategic decisions have changed the way they are performing their business. Although they worked intensely with trying to sell the variable printing in the early stages of their business development they all were forced to base their business model on producing small series and time critical jobs since the market for variable data printing was not yet ready.

All companies except Company C have had quite extensive initial problems with their equipment. The problems were most severe for Company D that was a very early adaptor of the technology. The problems were more comprehensive for the companies that did not have printing as their core business before engaging in digital printing.

An Undeveloped Market

The market for the value-added products that digital printing can offer and the volume of digital print media is still very small. The respondents believe that one main reason is the customers' and advertising agencies' lack of knowledge about the possibilities of the technology. As mentioned before technology change may result in uncertainty about customer needs, this has happened in digital printing. The lack of input jobs suitable for digital printing has forced the digital printing houses to more and more create their own input to be able to take advantage of their production technology. All companies steadily increase their share of direct customers and to some extent work as an advertising agency. By working directly with the customers and not via advertising agencies, it is possible to create jobs that are suitable and economical for digital printing. This weak market also raised the need for educating customers, this education is necessary to stimulate the market and the needed inputs for the digital printing equipment.

Despite the problems of finding suitable input jobs, most of the respondents mentioned overcapacity and price-cutting among the traditional printing houses as the greatest threat against their business. This has created a need to exploit the opportunity with the technology of digital printing in order to offer a differentiated service that does not compete with traditional printing houses.

Full Service Companies

One major problem for the digital printing industry has been that they have not been able to take advantage of the opportunities in the technology since companies that work upstream and downstream in the value system have not provided the appropriate input and have not been able to handle the output in a suitable way. There is no doubt that digital printing has changed the way profits and costs are distributed along the industry value system, the cost of printing becomes higher but the cost for stock keeping, distribution and discarded copies becomes lower. This has made it necessary to vertically integrate in the value system to make the core strategic business unit (SBU), digital printing, profitable. By offering a complete solution from customer to end-user, it is possible to profit on the other activities in the value system.

Almost all of the respondents first tried to sell the digital printing as a product, this did not result in any significant sales. This was because the market for print media was a commodity and it was not easy to sell a product based on nonprice competition.

To de-commoditize the product all companies in this study in some way have adopted a strategy that involves differentiation and to some extent even focus. The focus is most clear when discussing how they work geographically. The five companies that come from the graphic arts industry have a focus that is on local and regional customers. The different companies also have focused on servicing different lines of business.

By vertical integration in the value system the digital printing companies in this study have chosen to remake themselves into full service companies that can offer a digital printing service and not only the production of digitally printed material. They can offer a service where they can act as a supplier of print media at a low total cost and not only at a low print cost. When working with larger parts of the value system it is possible to change the behavior of the customer and help them identify the true cost of print media production.

Since the companies are rather small, a differentiation strategy results in a narrow line of services. As mentioned earlier, there are theoretical problems in the differentiation strategy that involve the narrow product line. In many cases, this problem has been overcome by coalitions with traditional printing houses that can offer longer runs at a cheaper price. In this way, it is possible to still satisfy customers even if production cannot be done in-house.

As mentioned before, backward integration was a result of the need to ensure a supply of jobs for the digital printing equipment. The integration into, for example the finishing service was, according to the respondents, a result of the need for short lead times. Many of the companies in the study found it necessary to have finishing in-house to be able to ensure the business model for digital printing with fast delivery and short runs.

Despite the initial problems with the variable data printing market, Company E and Company C have again started to more intensely market variable data printing as a service. This is mainly a result of new web-to-print solutions that makes it easy for the customer to create and order customized printed material in a simple way. The respondents believe that easy applications are essential for the market of variable data printing to grow.

Both the digitalization and the vertical integration in the printing industry shorten the lead times further for the customers and may help them take advantages of the possibilities of digital printing technology since they bypass intermediaries. By direct customer contact, it has been possible for the companies to offer simple services that the customers need and can benefit from. With the adoption of backward vertical integration it is possible for a printing house to totally bypass the printing step and offer the customers other output channels as a complement to printing, e.g. electronic media. This, however, has a direct negative effect on the printing SBU but may broaden the customer base and strengthen the relationship with their customers.

Vertical Integration

Even thought it is possible, when working in a differentiated business market, to make a business model less vulnerable to general negative changes in the industry like price-cutting, a company can never exclude the need for competition through price. It is important to realize that the industry will change and the need for establishing a low-cost position to be able to continue with the current production may be necessary.

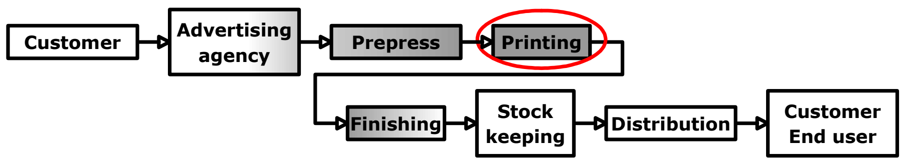
This is a way for digital printers to attempt to de-commoditize their product. Although differentiation makes it possible to work at a higher cost level, the existing market situation in the printing industry does not allow digital printers to ignore costs. Cost-consciousness is very important in order to succeed even though they deliver services that have a high value for the customer. The companies in this study are working with a high cost consciousness due to the current market situation with competition from low cost traditional printers.

Generally, the risk is high when engaging in vertical integration if the competition is intense. In the digital printing industry, the competition is somehow unclear since they do not see each other in the digital printing industry as their main competitors. Digital printing is a subset of the printing industry and the respondents believe that the digital printing industry will grow when new actors enter into the digital printing business. Even though the printing industry in general is a mature market, the digital printing industry is emerging as a subset. The companies have gained customer contact via integration, which is important when trying to launch a new product in a mature market.

Except for Company F the companies core businesses are focused around the printing unit. The studied companies have lowered the risk in the integration by making the integrated SBUs smaller than the core SBU. Then the major risk is still in the digital printing business unit since it is the one with the largest capacity. One example is the finishing business unit that takes care of smaller output for fast delivery but for larger volumes or more advanced finishing external partners are used as suppliers of finishing services.

This does also conclude with the theory of integration close to the company’s core SBU and the integration has pretty much involved smaller steps in the value system. Depending on the origin of the company, the value chain has expanded to include neighboring steps in the value system. This is consistent with previous research that shows that the further away from the core business the vertical integration goes, the less likely it is to succeed.

Figure 3: Vertical Integration in the Value System for Digital Printing.



The study shows that companies working with digital printing are adopting the value system of the digital print industry as their internal value chain (Figure 3). This is a way of transforming the actual printing process to a step in a print media service where a total cost saving or added value to the customer can be made with resources that are different than those used in the traditional printing industry value system.

This study has only treated the stages of integrated activities and not the breadth. However as mentioned before the integrated SBUs in general are not adjusted to be able to create or take care of all internal transfer. The printing SBU still takes input from external advertising agencies and delivers to external finishing companies. In most cases, the integrated SBUs do not have the breadth or capacity to survive on their own as a stand-alone company.

Although differentiation is one key to success and is accomplished by vertical integration, the integration is both conscious and unconscious since some changes had to be done in order to survive in the business. Digital printing business differs form traditional printing business since it is not based on large volumes in the way the general printing business is. Volumes are important, the respondents are unanimous about this fact, and it is important to have full order stack on the digital printing equipment. However, the problem in digital printing is that the volumes rarely come from a single job but from a large number of jobs. By working with a customer focus and creating added value, it is possible to increase the revenue from both the printing SBU but also from other activities in the value system. When the number of jobs is high, the workflow becomes important and by vertical integration the closeness between the different activities increases. This makes the workflow run smoother and the knowledge of the possibilities and limitations of the technology increases.

The profiles of the companies are different and some have specialized on short runs and fast delivery and some on more sophisticated services involving personalization and print-on-demand. However, what characterizes these companies is that they all have accomplished vertical integration to some extent to pursue their strategy.

CONCLUSIONS

In the larger media perspective, digital printing has strengthened the competitiveness of print by providing a more flexible output than material printed with traditional printing technology. Historically, printing has been an output option only for mass production. With digital printing this condition has changed and it has become possible to create and publish smaller and customized editions. This has a direct impact on all customers to printing houses that has smaller customer bases, or use one-to-one marketing in their customer contact. As printing is one output channel among many others, and cross channel publishing is becoming more and more common, it is important for printing houses that the printed material offers the flexibility and customization opportunities that other media do.

Even though digital printing offers this flexibility and can easily be used as an on-demand output channel, it still has a cost disadvantage in the printing and distribution steps over electronic media that can use the Internet as an inexpensive way of distributing information. On the other hand, digitally printed matters have to be assessed from other values, not least the tangible ones compared to the intangible that electronic media offers, without having the same need of a large-scale production as offset.

Many of the companies in this study had different strategic business units (SBU) before engaging in digital printing. But the move to digital printing has caused companies that earlier worked in different steps in the value system, to work alongside each other with the digital printing service. Although almost all companies in this study had major initial problems with sales and technological issues, they are confident that the digital printing investments are good for their businesses.

The need of ensuring input and fast handling of output has led the companies to make strategic decisions to vertically integrate additional SBU. This has been carried out both backwards to get customer contact and forward to e.g. take care of finishing in-house. By differentiating the product by adding a higher customer value, it is possible to work in a segment with a relative high cost position comparing to the companies that are cost leaders.

The study also shows that the companies are working towards increasing their share of direct customers in relation to advertising agencies. The printing houses have adopted a strategy that involves going towards a full service customer-centered company. This is very well suited for direct customers since they often want a complete service. By engaging in vertical integration it is possible to create a service that can add customer value not only by offering variable data printing but also to cut costs in stock keeping, distribution and discarded copies. This has helped the digital printing business de-commoditize their business to some extent.

The study, however, shows that due to the undeveloped market for variable data printing, the primary way added customer value arises is by cost efficiency in small editions and short lead times for time critical jobs. As an attempt to increase the market for variable data printing, education and support have become important parts of the way the companies work with direct customers, advertising agencies and subcontractors to make the customers realize the possibilities with digital printing.

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