Digital Printing Success Models: Validation Study (2004)

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A Research Monograph of the

Printing Industry Center at RIT

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With Thanks

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Introduction

In 2003, the RIT Printing Industry Center monograph titled *Investing in Digital Color… the Bottom Line*[1] identified four different business models that were related to successful digital color print services enterprises. The four models reflected different levels of investment in equipment, telecommunications and networking infrastructures, and human resources. Figure 1 summarizes the four business models in terms of investment strategies and market focus.

The purpose of this research is to validate those four models. The 2003 research was based on a small sample size of print services providers which did not allow us to generalize to a wider population. Are there just four models? Or are there more or fewer? The earlier study described the investment in infrastructure only and did not include other aspects of the businesses in the model profiles. Therefore, a more in-depth study was designed to provide more reliable estimates of the investments for each model and to add business performance measures.

The current research was designed to:

1. Validate the business models of successful digital print services providers, using a larger sample and more robust statistics methods of clustering.

2. Provide a fuller picture of print services providers in terms of proportion of revenue associated with variable data jobs, digital color versus digital black and white, and what industries are targeted by their selling efforts.

3. Identify the hardware, software, and other infrastructure characteristics related to each business model and estimate the financial investments that were made.

4. Describe in greater depth the nature of the applications of these print services providers (e.g., mail/merge versus fully customized materials) and the marketing goal of their programs (acquisition or retention).

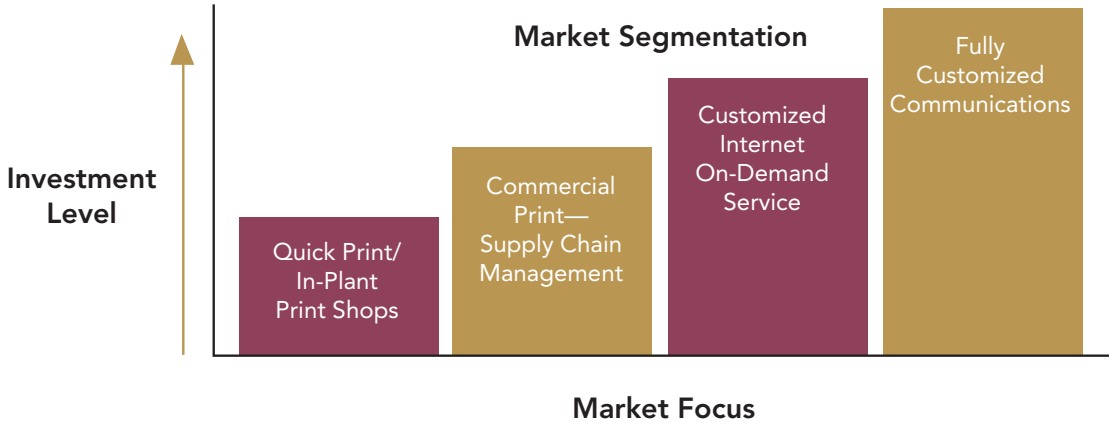

Figure 1. Market Segmentation Levels

METHOD

Sample

Digital print providers were identified by conducting a key word search of online trade magazine press releases and articles. A total of 340 firms were identified. Of these, 171 completed a 20-minute telephone survey yielding, a response rate of 50%. Since they were identified by their coverage in trade journals, they likely represent the "best of breed."

Procedure

In late winter 2004, all digital printers on our list were sent a letter from RIT requesting their participation in a phone survey. A short version of the survey was included to provide some background about our focus and questions of interest. They were notified to expect a phone call from the research service firm within the following two weeks to conduct the survey. Upon their completion of the survey, they were provided with a $25 stipend to thank them for their time.

Questionnaire

A copy of the questions along with the descriptive statistics for the sample is presented in Appendix A. An important part of the survey was to determine the type of applications the sampled firms were producing using variable data printing. Six types of applications are defined below. In the phone interview, respondents were asked for each application whether it was a "major" part of their revenue for variable data print jobs, a "minor" part, or "not at all" a part of their revenue.

Types of Applications

1. **Versioning**: Variations of a document or business communication based on a specific characteristic(s) of the recipient or location. Printed documents are segmented by groupings of individuals with the specific trait. The printed document is not designed for a specific individual; rather, the document a person receives is determined by that person's group membership (such as geography, gender, or language).

2. **Mail merge:** Varying only name, address, and salutation on the printed document.

3. **Personalized printing:** Using data about the recipient, beyond name and address, to create a more relevant offer based on demographics, lifestyle, or past buying history.

4. **Transaction printing:** Transaction documents are business documents such as bills, statements, order documents, receipts, delivery notices, invoices, or shipping documents that speak to the individual customer. Often, transaction documents print data center information on static or pre-printed forms.

5. **Internet on-demand:** The Internet is used to distribute templates of a document so that another document author can add personalized content. This might include the name of the local dealer , to be placed in a document template that is managed by a corporate manufacturer. This is often applied to the development of dealer-specific documents such as sales collateral.

6. **Fully customized communications:** A sophisticated publishing technique where all elements on each printed piece, from brochures to newsletters, are dynamic or variable. This enables organizations to create unique content for each person based on a database of information about the person.

Clustering Method

Using k-means clustering analysis (SPSS), the firms were clustered on their responses ("major," "minor," or "not at all") to the above applications. The clustering solution was attempted with three-, four- and five-cluster groupings. The four-cluster solution was found to be the most stable. Of the 171 firms entered into the cluster analysis, the four-cluster solution included all but one firm. This firm was viewed as an outlier and dropped from all further analysis (it was an outlier in all three clustering attempts). The remaining variables were cross-tabulated by cluster and are summarized in Appendix B.

Results

DESCRIPTION OF SAMPLE

On average, respondent firms had been in business for 35.5 years (see Figure 2). In terms of the nature of their business, 31% of the respondents stated their businesses as either commercial printers or marketing agencies. A smaller number started as service bureaus (11%) or quick printers (9%).

The size of the firms was measured in two ways—number of employees and annual revenues. A distribution of firms by number of employees is shown in Figure 3. There was a median of 48 employees in the firms; the average of 255 reflects the relatively few large firms in the sample with over 3,000 employees. The average number of employees by function were as follows: the average number of production employees was 39; sales employees averaged 13; and customer service employees averaged 9, followed by prepress with 8, and information technology with 7. In terms of annual revenues, we found a bimodal distribution where almost one-third of firms had under $3 million in revenues (30.4%), and another third had over $10 million in revenues (34.1%)—see Figure 4. Revenue growth over the last 12-month period was reported to be 6% (median).

Figure 5 shows the percent of revenue that came from variable data jobs. The median was 5%, with an average of 21% reflecting again the few outliers with high values.

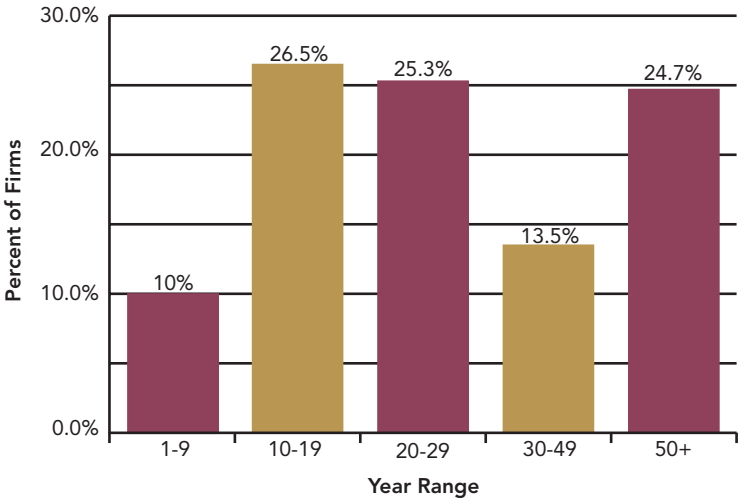

Figure 2. Years Firm Has Been in Business

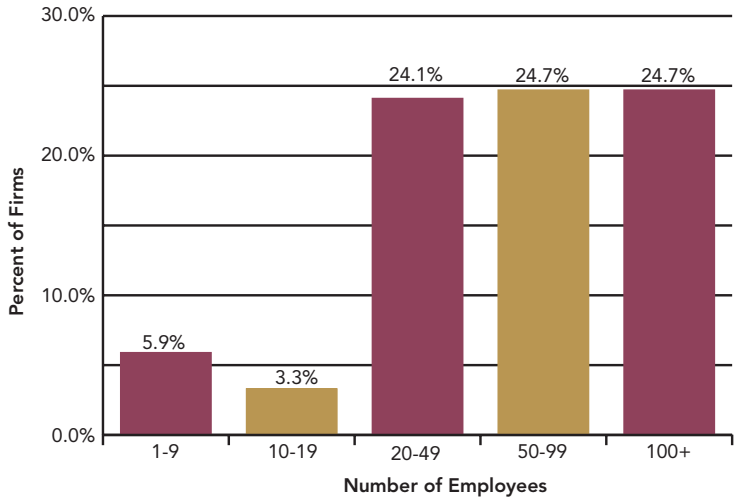

Figure 3. Employee Totals

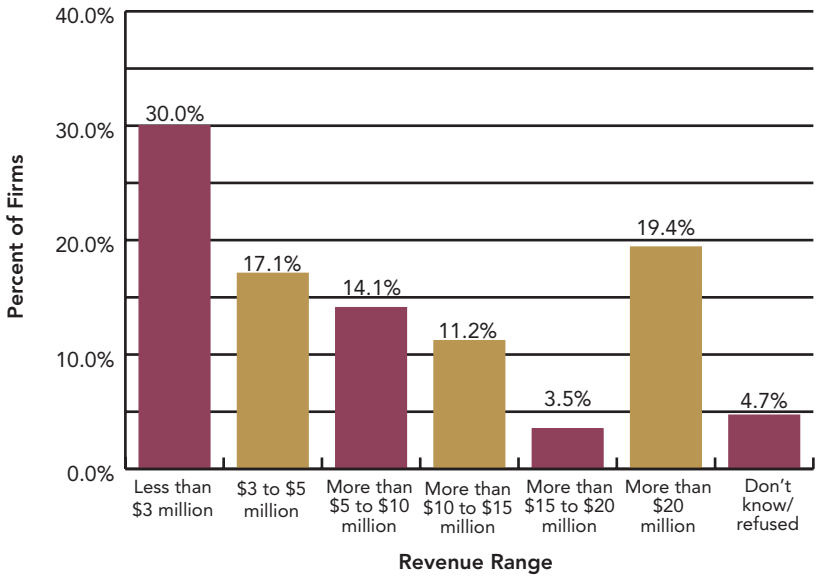

Figure 4. Respondents' 2003 Revenue

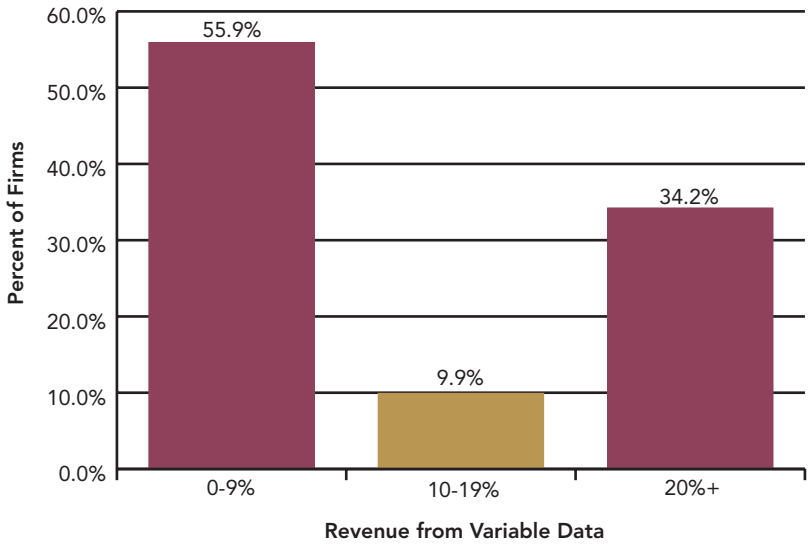

Figure 5. Percent of Revenue from Variable Data

APPLICATIONS

We asked what percent of digital printing, overall, was monochrome and what percent of *variable data* printing was monochrome. Just over half (56.0%) of our respondents' overall digital printing is monochrome, and a somewhat lower percentage of variable data printing is monochrome (44.8%).

In terms of applications, Figure 6 shows the percent that reported whether each of the six types was either a "major," "minor," or "not-at-all" contributor to their revenues. The rank order in terms of major applications was mail merge, personalized printing, versioning, fully customized, Internet on-demand, and transaction. Transaction printing was the least frequent type of variable data job for these respondents, with 54% reporting that it did not at all contribute to revenues.

We also asked about the goals for the marketing programs that used these applications. Retaining customers and building loyalty typified 52.6% of the variable data jobs, and seeking new customers typified 39.2%. Nearly half (46.2%) of respondents' companies target specific vertical industries in selling variable data print services. Financial services/insurance (20.2%), manufacturing (18.4%), and retail (15.4%) are most important. A relatively small proportion of their work, or 19.7% of jobs, is for advertising agencies on behalf of their clients. This relatively low percentage is explained by the fact that a large number of our respondents view themselves as marketing agencies themselves.

When asked what were the challenges they face in implementing variable data print programs, nearly all respondents reported that they need to communicate the value of personalization to their customers (84.1%). Nearly as many respondents also noted that large clients do not have a retention or customer relationship strategy (82.9%), and clients had poor data quality (80.6%).

EQUIPMENT

There was a large variation in the makes of digital printing presses that the firms use for digital printing. However, Xerox has a significant lead among respondents at 44.2%, followed by Hewlett Packard Indigo at 16.1%, and Heidelberg (now Kodak Digital) at 10.7%. Almost 70% of respondents also own offset equipment.

There does not appear to be a clear-cut leader for variable information software. Yours Truly from HP Indigo garnered 14.6% of responses, followed by custom-developed software (8.2%), and Darwin from Creo (7.6%). A complete list is found in Appendix A, at question 23.

INVESTMENT

Table 1 shows the costs for all of the investments in getting started with variable data printing. The initial press investment (5% trimmed mean) was between $250,000 and $300,000. This represented an average of 68% of the total initial. The other expenses were software, other hardware, and networking and telecommunications.

Most of our respondents bought their first presses between 1998 and 2002. Levels peaked in 2002, with 13.5% of firms making the investment in that year.

VALUE-ADDED SERVICES

Of our respondents, 56.1% are aware of the ASP business model for digital printing. Of those, 57.3% have considering using the model. When asked what other services are provided for variable data printing jobs besides printing, the results were consistent with our 2003 research[2]. Over 70% of respondents indicated that they offered the following services: finishing, fulfillment, mailing, database management, and creative services. Forty-three percent of respondents bill separately for these ancillary services, while 26.9% build them into the cost, and another 26.9% do both.

Only 22.8% of respondents measure the success of their variable data printing jobs for the customer. In most cases, the customer measures the results.

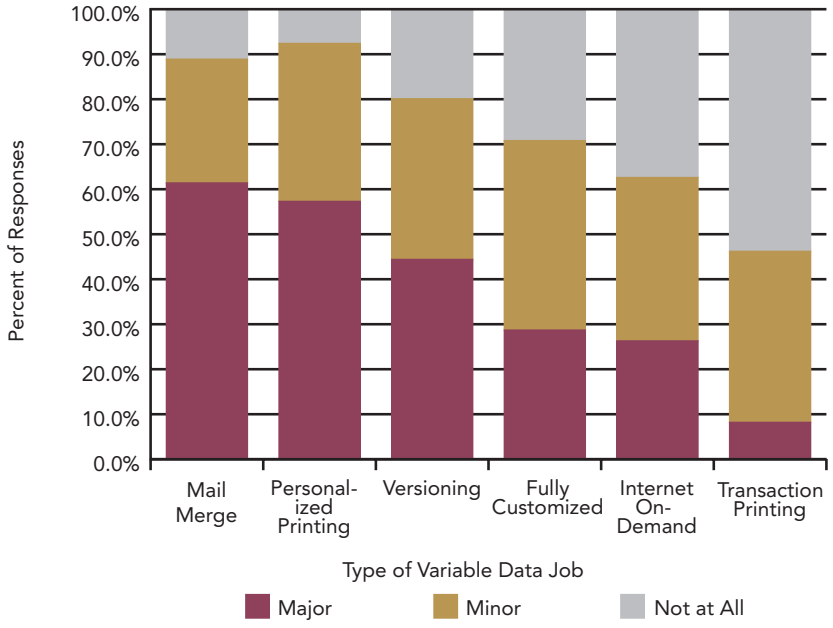

Figure 6. Variable Data Printing Mix: Impact of Each Type

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

Table 1. Investment Costs for Implementing Variable Data Printing

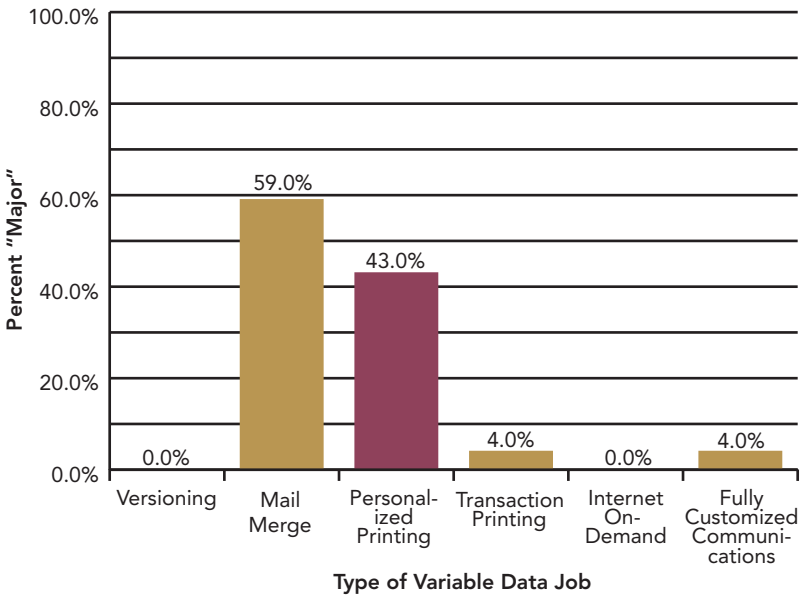

Figure 7. Level 1 (Cluster 3): Quick Print Major Applications

CLUSTER ANALYSIS

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

The clusters were created by the relative concentration of revenue from six types of variable data applications. The cluster analysis revealed very different types of digital printers based on application focus. See Figures 7, 8, 9, and 10 for a distribution of major applications for each cluster. The clustering solution revealed that versioning was a major application for 100% of firms in Cluster 4 but for none of the firms in Cluster 3. The mail-merge application was a major source of revenue for all but Cluster 1. Personalized applications was a major source for

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

Table 2: Cluster Analysis Summary

all clusters but not transaction printing. Both Internet on-demand and fully customized printing were major sources of revenue for Clusters 1 and 2 but not Clusters 3 and 4.

The next step in the analysis was to determine if the firm demographics and infrastructure investment varied by cluster. The differences among the clusters in their business models and investment strategies from the lowest level of investment (Level 1) to the highest level (Level 4) are described below. This cluster analysis confirmed and helped refine our view of the four models described in our exploratory study conducted in 2003.

Level 1: Quick Print Model (Cluster 3)

Cluster 3 was comprised of 46 firms who were among the smallest of the companies that were interviewed, with a mean of 51 employees. They also had the lowest amount of revenue that came from variable data printing jobs at 8%. Their major digital printing applications were mail merge and personalized communications (see Figure 7). They had the lowest investment in digital presses of the four clusters (an average of $171, 000), and the lowest total investment at just over $200,000 (see Figure 11). The percent of IT employees versus those in production was 7%. Although we labeled this cluster the "quick print" cluster, it is interesting to note that a majority (74%) also own offset equipment, so the quick print nomenclature may be somewhat misleading. The quick print name refers only to their digital applications.

Level 2: Commercial Short-Run Model (Cluster 4)

Cluster 4 was comprised of 31 firms and resembled the quick print cluster in terms of its size (a 5% trimmed mean of 51), and the ratio of IT employees to production employees (5%). However, the fourth cluster had more revenue from variable data printing jobs (19%), due primarily to the major printing application of versioning reported by 100% of this group (see Figure 8 for a distribution of major applications). Their investment was the next largest, with an average spent on presses at $269,500 and a total investment of approximately $310,000. We labeled this cluster "commercial short-run." Based on the long-term history of these firms, there was likely to be significant infrastructure in place for finishing, fulfillment, and distribution. This reduced the need for additional infrastructure investments, so that the primary cost was associated with the price of the digital press equipment (87% of the original investment).

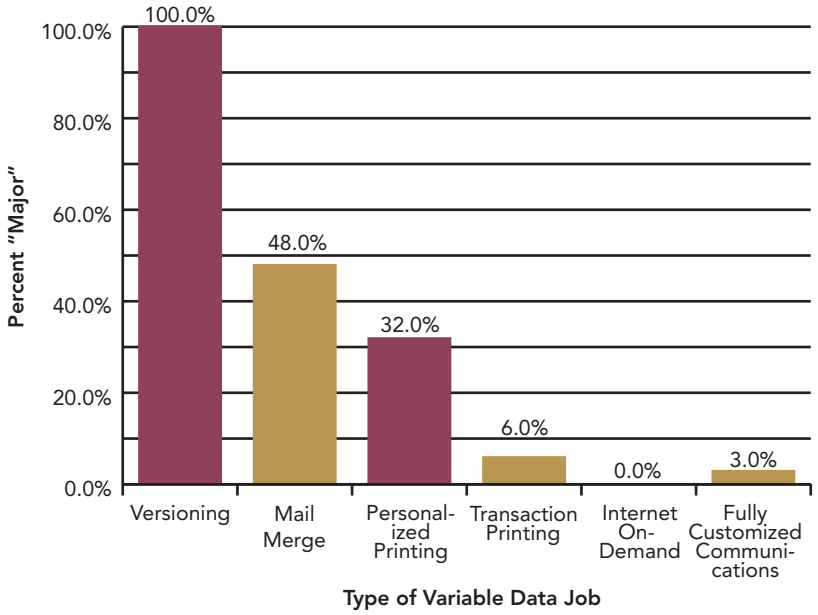

Figure 8. Level 2 (Cluster 4): Commercial Short Run Major Applications

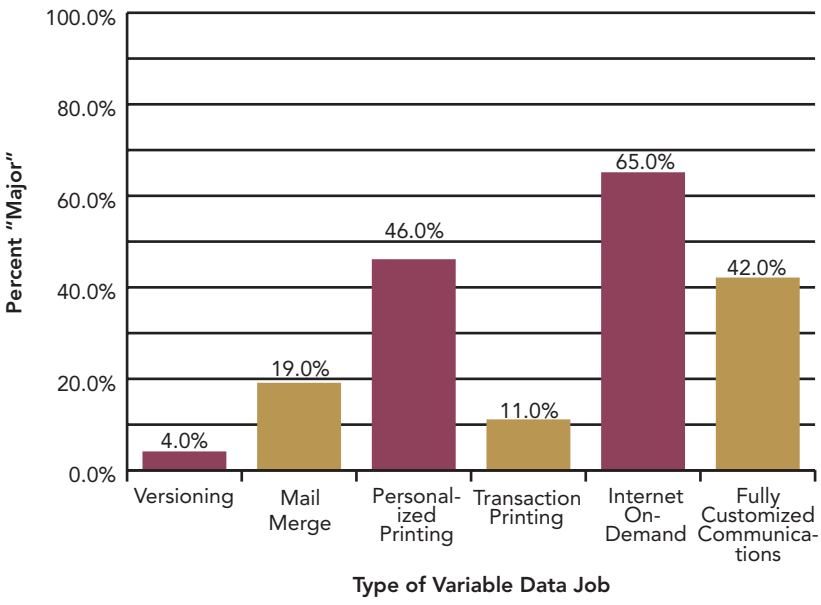

Figure 9. Level 3 (Cluster 1): Internet On-Demand Major Applications

Level 3: Internet On-Demand Model (Cluster 1)

The cluster with the third-highest level of investment was our first cluster of 26 firms. They were slightly larger in size than Clusters 3 and 4 described above, with an average of 70 employees, and they derive 23% of their revenues from variable data printing. The top jobs were Internet on-demand (65%) and fully customized jobs (42%) (see Figure 9). They invested a total of $520,000, and 69% of that was for the initial press investment at nearly $349,000. They also had a higher proportion of IT employees to production employees (16%). We called this cluster "Internet on-demand."

Level 4: Full Service/Fully Customized Model (Cluster 2)

The highest level of investment was found in Cluster 2. As the largest cluster, with 67 firms, this group of companies had the largest number of employees, with an average of 118. The investment in capital equipment to support digital printing reflected their size. With a total investment of just over $900,000, less than half (46%) was spent digital press equipment. Their revenue from variable data printing jobs was the highest among the groups at 31%. As shown in Figure 10, these firms report that they have a major presence in almost all of the applications listed: versioning, mail merge, personalized, and fully customized jobs. Only 10% of the firms in this cluster reported that transaction printing was a major application. This cluster was labeled "full service/fully customized."

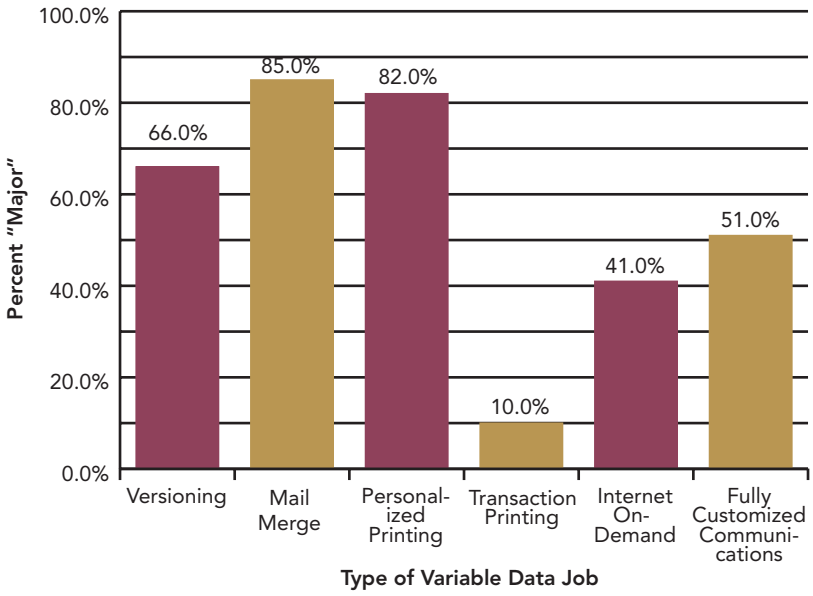

Figure 10. Level 4 (Cluster 2): Full Service/Fully Customized Major Applications

Discussion

In this research, we confirmed that there were four typical business models for success in variable data printing. As noted in Table 2, all four clusters had a 12-month increase in revenue of 9-16%, and this difference was not statistically significant among the clusters. We can conclude that there are *many* ways of achieving business success using digital printing technology, depending on the size of the business and its traditional strengths with the current client base.

There were a number of similarities between the Internet on-demand (IOD) and the full-service/fully customized (FS/FC) clusters. Both had a large proportion of IT employees; both had a large proportion of revenues coming from variable data printing; and both had high percent growth in revenues. What is the difference between them? It is likely that the difference is use of the "push" versus "pull" models for personalized communications.

The IOD model uses the push strategy. Compared to the FS/FC cluster, the IOD reported a higher percentage of jobs that were designed to seek customers (46% for IOD and 31% for FS/FC). Conversely, the FS/FC cluster reported more jobs that were designed to retain customers or build loyalty (63% for FS/FC versus 35% for IOD). This is consistent with the case studies of digital printers profiled in the 2003 monograph in the IOD cluster that targeted local franchisees affiliated with nationwide organizations in the creation of market-relevant content. This application involves developing a Web-based template that allows the local sales channel partner to leverage its knowledge about market characteristics. The end user can add localized information (data) to an existing Web-based template to create customized marketing materials in small runs and on-demand. The technology ensures that brand integrity and corporate messaging are not compromised. The goal is to increase the number of customers coming to the local store.

In contrast, the FS/FC printer has built a software infrastructure that is based on a "pull" model that is initiated with the customer's inquiry to the web site or call center. As noted in our case studies in our 2003 study, these full-service customized printers work with clients in planning data acquisition and data mining strategies to individualize the offerings. Marketing materials are generated on the fly, dynamically selecting and including relevant, up-to-date customer information and related resources based on predefined parameters. These service providers likely support their clients' customer relationship management initiatives. Using variable text, pictures, graphics, and barcodes, a dynamic document is created in which the entire layout varies with the preferences captured from previous interaction with the customer. Software rules customize the content. For example, if the recipient is female and over 30 years of age, insert paragraph 1 and graphic 3; if the recipient is male and less than 45 years of age insert paragraph 12 and image 5. The result is a document designed for the individual recipient. These FS/FC printers have invested in high-speed digital color print technology as well as the infrastructure to provide electronic distribution. This enables them to publish documents as printed pages and/or as emails, Web pages, PDF documents, SMS messages, XML files, and faxes. FS/FC printers also often provide consulting services such as data mining after the data is captured by the customer-facing systems.

In addition, with their mix of conventional printing equipment, FS/FC printers, as well as IOD, can also perform digital document supply chain management. In this application,

services include materials management and customized distribution and fulfillment services. The service provider creates value by helping corporate clients increase the efficiency of their supply-chain and deliver printed materials more cost-effectively, thereby reducing the inventory of documents and reducing loss to obsolescence. These print providers help a variety of corporations improve the performance of their print and promotion fulfillment programs. They typically have roots in the traditional commercial print market and use a blend of offset and digital equipment to produce printed product.

A word about transaction printing. Only 8% of the digital printers here reported that it was a major part of their digital printing applications and another 38% said it was a minor part. Why weren't there more transaction printers in our sample? Possibly because much transaction printing occurs in-house, our sample of independent print services providers would not have included them. A second possibility is that since it is one of the earliest applications of monochrome digital printing, we may have completely missed transaction printing in our selection of the sample because we focused on those printers who have recently been in the news. An exception is DST Output, the largest first-class mailer in the U.S., producing over 1.8 billion pieces of mail last year, primarily for the financial services and utilities sectors[3]. A further investigation into the transaction or statement printing providers is warranted.

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

ENDNOTES

[1] Pellow, B. A., Pletka, M.J., & Banis, H. (2003). *Investing in Digital Color… The Bottom Line* (PICRM-2003-10). Rochester, NY: Rochester Institute of Technology, Printing Industry Center.

[2] Pellow, B. A. & Sorce, P. (2003). *The Role of Value-Added Services in Successful Digital Printing* (PICRM-2003-02). Rochester, NY: Rochester Institute of Technology, Printing Industry Center.

[3] Pellow, B.A. (2004, February). Bills can bring more than just headaches. *Digital Output Magazine*. Retrieved November 4, 2004, from http://www.digitaloutput.net

Appendix A: Summary of Survey Responses

1.)	How many years has your firm been in business?	Count	Mean	Min	Max	SD
		171	35.5	0	200	31.2
2.)	When you (or the owner) first started the business, what did you call yourself?	Count	Percent			
	Commercial printer / marketing agency	53	31.0			
	Mail house	7	4.1			
	Prepress company	12	7.0			
	Service bureau	20	11.7			
	Quick printer	16	9.4			
	Book publisher	2	1.2			
	Business forms distributor	6	3.5			
	Copy center/copy shop	5	2.9			
	Data supplier	3	1.8			
	Digital/digital color printer	7	4.1			
	Direct marketing agency	3	1.8			
	Office supply co.	2	1.2			
	Print broker	4	2.3			
	Software company/developer	3	1.8			
	Type house/typesetter	8	4.7			
	Photography	4	2.3			
	Specialty printer	2	1.2			
	Other	14	8.2			
	Total	171	100			
4.)	Which of the following best describes your company's 2003 revenues?	Count	Percent			
	Less than $3 million	52	30.4			
	$3 million to $5 million	29	17.0			
	More than $5M to $10M	24	14.0			
	More than $10M to $15M	19	11.1			
	More than $15M to $20M	6	3.5			
	More than $20M	33	19.3			

Appendix A

4.)	*(cont.)* Which of the following best describes your company's 2003 revenues?	Count	Percent			
	Don't know/refused	8	4.7			
	Total	171	100			
5.)	What percent of revenue was from variable data print jobs?	Count	Mean	Min	Max	SD
		162	20.9	0	100	28.8
6.)	How many employees are in your company?	Count	Mean	Min	Max	SD
		171	254	4	10000	1160
7.)	How many facilities do you have in separate locations?	Count	Mean	Min	Max	SD
		171	2.4	1	63	6.4
8.)	How many employees do you have in each of the following functions?	Count	Mean			
	Production	161	39			
	Prepress	162	8			
	IT	162	7			
	Sales	162	13			
	Customer service	163	9			
9.)	What was your percent growth in revenues over the last 12-month period?	Count	Mean	Min	Max	SD
		149	13.2	0	200	24.22
10.)	What percent of your:	Count	Mean	Min	Max	SD
	printing is monochrome?	171	56.0	0	100	37.6
	variable data printing jobs are monochrome?	168	44.8	0	100	37.5
11.)	Of all of the variable data printing jobs you do, what is the mix in terms of the following six types?	Count	Percent			
	Versioning					
	Major	76	44.4			
	Minor	61	35.7			
	Not at all	33	19.3			
	Don't know/refused	1	0.6			
	Total	171	100			
	Mail merge					
	Major	105	61.4			

11.)	*(cont.)* Of all of the variable data printing jobs you do, what is the mix in terms of the following six types?	Count	Percent			
	Minor	47	27.5			
	Not at all	19	11.1			
	Total	171	100			
	Personalized printing					
	Major	98	57.3			
	Minor	60	35.1			
	Not at all	13	7.6			
	Total	171	100			
	Transaction printing					
	Major	14	8.2			
	Minor	65	38.0			
	Not at all	92	53.8			
	Total	171	100			
	Internet on-demand					
	Major	45	26.3			
	Minor	62	36.3			
	Not at all	64	37.4			
	Total	171	100			
	Fully customized communications					
	Major	49	28.7			
	Minor	72	42.1			
	Not at all	50	29.2			
	Total	171	100			
12.)	Of the job types you indicated that were a "major" portion of the variable data jobs you print, please tell me which one is the largest portion?	Count	Percent			
	Versioning	24	14.0			
	Mail merge	50	29.2			
	Personalized printing	35	20.5			
	Transaction printing	6	3.5			
	Internet on-demand	23	13.5			
	Fully customized communications	18	10.5			
	None marked "major"	9	5.3			
	Don't know/refused	6	3.5			
	Total	171	100			

Appendix A

	What percent of your total annual revenue comes from your largest major variable data print job type?	Count	Percent			
	Versioning	23	53.4			
	Mail merge	39	55.5			
	Personalized printing	29	58.2			
	Transaction printing	5	33.6			
	Internet on-demand	22	54.1			
	Fully customized communications	18	71.4			
13.)	What percent of the respondents indicated that each of the following are a moderate to large challenge that they face in implementing variable data print programs?	Count	Percent			
	Poor quality of data on the client side	170	80.6			
	Variable data software is too complicated	170	31.8			
	Need for customized software to be written	170	37.6			
	Access to digital assets such as graphics, photos	170	38.2			
	Clients do not have a retention or customer relationship strategy	170	82.9			
	Communicating the value to our customers of ROI benefits of personalization	170	84.1			
	Merging the client's database with variable data software	170	31.2			
14.)	You may frequently see these following marketing programs among the variable data print jobs you do. Of these, which do you see most frequently?	Count	Percent			
	Seeking new customers	67	39.2			
	Retaining or building loyalty among existing customers	90	52.6			
	Completing transactions or billing	7	4.1			
	Don't know/refused	7	4.1			
	Total	171	100			
18.)	Do you focus on specific vertical industries when you sell your variable data printing services?	Count	Percent			
	Yes	79	46.2			
	No	90	52.6			
	Don't know/refused	2	1.2			
	Total	171	100			

	Which ones are most important to your business?	Count	Percent			
	Financial services/insurance	46	20.2			
	Education, charity or not-for-profit	31	13.6			
	Manufacturing	42	18.4			
	Health care	31	13.6			
	Entertainment/gaming	15	6.6			
	Retail	35	15.4			
	Catalog/direct	10	4.4			
	Government	2	0.9			
	Technical	2	0.9			
	Utilities	1	0.4			
	Hospitality/travel/tourism	4	1.8			
	Publishing/advertising/communications	4	1.8			
	Other	5	2.2			
	Total	228	100			
	From which two do you derive the greatest revenue?	Count	Percent			
	Financial services/insurance	19	22.9			
	Education, charity or not-for-profit	11	13.3			
	Manufacturing	18	21.7			
	Health care	11	13.3			
	Entertainment/gaming	4	4.8			
	Retail	10	12			
	Catalog/direct	3	3.6			
	Government	1	1.2			
	Hospitality/travel/tourism	1	1.2			
	Publishing/advertising/communications	3	3.6			
	Other	2	2.4			
	Total	83	100			
19.)	For your most recent variable data client, what is the title of the person who made the decision to conduct a personal campaign?	Count	Percent			
	Marketing manager/coordinator/director	64	37.2			
	Account executive/manager/project manager	8	4.7			
	Art director/creative director	3	1.7			
	CEO/COO/owner/president	16	9.3			
	Production manager	4	2.3			
	Vice president of marketing/sales	19	11.0			
	Human resources	3	1.7			

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19.)	*(cont.)* For your most recent variable data client, what is the title of the person who made the decision to conduct a personal campaign?	Count	Percent			
	Sales manager	3	1.7			
	Buyer	4	2.3			
	Executive/administrator	2	1.2			
	Other manager	4	2.3			
	Other	9	5.2			
	Don't know/refused	33	19.2			
	Total	172	100			
20.)	What percent of the variable data print jobs that you do are for an ad agency on behalf of their client?	Count	Mean	Min	Max	SD
		168	19.7	0	100	23.8
21.)	What makes of digital printing presses do you currently own?	Count	Percent			
	Canon	25	6.7			
	Epson	1	0.3			
	Heidelberg	40	10.7			
	hp indigo	60	16.1			
	IBM	3	0.8			
	Konica	3	0.8			
	Minolta	1	0.3			
	NexPress	20	5.4			
	Oce	5	1.3			
	Ricoh	5	1.3			
	Scitex	3	0.8			
	Xeikon	25	6.7			
	Xerox	165	44.2			
	Other	13	3.5			
	Don't know/refused	4	1.1			
	Total	373	100			
22.)	Do you also own offset equipment?	Count	Percent			
	Yes	119	69.6			
	No	51	29.8			
	Don't know/refused	1	0.6			
	Total	171	100			

23.)	What variable information software are you using?	Count	Percent			
	Darwin from Creo	13	7.6			
	DesignMerge Solutions from Banta Integrated Media	9	5.3			
	Dialogue from Exstream Software	4	2.3			
	DL Formatter from Datalogics	9	5.3			
	MPower from Pageflex	1	0.6			
	NexTreme from Heidelberg	2	1.2			
	pdfExpress from think121	2	1.2			
	Persona from Pageflex	1	0.6			
	PersonalEffect from XMPie	1	0.6			
	Personalizer-X from TechnoDesign	11	6.4			
	PlanetPress3 from Objectif Lune	3	1.8			
	PreS from Printsoft Americas	2	1.2			
	PrintNet from GMC Software Technology	5	2.9			
	PrintShop Mail from Atlas Software	12	7.0			
	VIPP from Xerox Corporation	10	5.8			
	Vitesse from Elixir Technologies Corp.	2	1.2			
	Yours Truly from hp indigo	25	14.6			
	Custom developed software	14	8.2			
	X Data by EM Software	6	3.5			
	Microsoft Word	5	2.9			
	Quark	2	1.2			
	File Maker	2	1.2			
	Adobe	3	1.8			
	Other	8	4.7			
	Don't know/refused	19	11.1			
	Total	171	100			
25.)	What was your total initial investment for the press to get started with variable data printing?	Count	Mean (5% trimmed)	Min	Max	SD
		140	$282,516	$0	$20,000,000	$2,219,643
26.)	What was your total initial investment for the software to get started with variable data printing?	Count	Mean (5% trimmed)	Min	Max	SD
		144	$17,370	$0	$500,000	$74,237

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27.)	In what year did you make this initial variable data printing investment?	Count	Percent			
	Don't know/refused	4	2.3			
	1980	1	0.6			
	1981	1	0.6			
	1984	1	0.6			
	1985	2	1.2			
	1986	1	0.6			
	1987	2	1.2			
	1989	2	1.2			
	1991	2	1.2			
	1992	3	1.8			
	1993	1	0.6			
	1994	7	4.1			
	1995	11	6.4			
	1996	16	9.4			
	1997	7	4.1			
	1998	20	11.7			
	1999	20	11.7			
	2000	13	7.6			
	2001	19	11.1			
	2002	23	13.5			
	2003	13	7.6			
	2004	2	1.2			
	Total	171	100			
28.)	Did you make additional technology investments as part of your initial start-up in variable data printing? If so, what was the cost?		Mean (5% trimmed)	Min	Max	SD
	Additional hardware investment		$11,429	$0	$200,000	$27,164
	Total additional software investment		$14,429	$0	$20,050,000	$1,538,292
	Total network/telecom/Internet investment		$6,484	$0	$80,000,000	$6,135,885
	Database investment		$1,820	$0	$140,000	$16,440
	Other investment		$716	$0	$500,000	$44,819
	Total infrastructure investment		$416,250	$0	$80,950,000	$6,648,641
29.)	Have you heard of an ASP (Application Service Provider) business model for digital printing?	Count	Percent			
	Yes	96	56.1			
	No	75	43.9			
	Total	171	100			

	If yes, have you ever considered using one to implement your variable data programs to current or new customers?	Count	Percent			
	Yes	55	57.3			
	No	40	41.7			
	Don't know/refused	1	1.0			
	Total	96	100			
30.)	Besides printing, what other services do you provide for variable data printing jobs?	Count	Percent			
	Creative support	120	70.6			
	Database management	122	71.7			
	Finishing options	160	94.1			
	Kitting, fulfillment and distribution,	148	87.1			
	Mailing support including sorting and meeting postal regulations	144	84.7			
	Response measurement	62	36.5			
	Telemarketing	20	11.8			
	Data mining	56	32.9			
	List management	80	47.1			
	Email marketing	55	32.4			
	Don't know/refused	3	1.7			
31.)	How do you charge for these ancillary services? Is it typically built into the cost of the printing job or do you bill separately for each service?	Count	Percent			
	Built into cost	46	26.9			
	Bill separately for each service	74	43.3			
	Both	46	26.9			
	Neither	2	1.2			
	Don't know/refused	3	1.8			
	Total	171	100			
32.)	Do you typically measure the success of their variable data printing jobs for your customer?	Count	Percent			
	Yes	39	22.8			
	No	132	77.2			
	Total	171	100			

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	If no, do you know who does?	Count	Percent			
	The customer	73	55.3			
	A third party	3	2.3			
	In-house	2	1.5			
	No one	1	0.8			
	Someone else	1	0.8			
	Data mining company	1	0.8			
	Don't know/refused	51	38.6			
	Total	132	100			

Appendix B: Summary of Survey Responses by Cluster

1.)	How many years has your firm been in business?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		171	35.5	32.7	33.9	48.3	33.4
2.)	When you (or the owner) first started the business, what did you call yourself?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Commercial printer / marketing agency	53	31.0	39.1	35.5	30.8	22.4
	Mail house	7	4.1	2.2	6.5	0.0	6.0
	Prepress company	12	7.0	13.0	6.5	3.8	4.5
	Service bureau	20	11.7	10.9	12.9	11.5	11.9
	Quick printer	16	9.4	8.7	9.7	7.7	10.4
	Book publisher	2	1.2	0.0	0.0	0.0	3.0
	Business forms distributor	6	3.5	0.0	9.7	7.7	1.5
	Copy center/copy shop	5	2.9	8.7	0.0	0.0	1.5
	Data supplier	3	1.8	2.2	0.0	7.7	0.0
	Digital/digital color printer	7	4.1	0.0	3.2	11.5	4.5
	Direct marketing agency	3	1.8	0.0	0.0	0.0	4.5
	Office supply co.	2	1.2	2.2	0.0	0.0	1.5
	Print broker	4	2.3	0.0	0.0	0.0	6.0
	Software company/developer	3	1.8	0.0	0.0	3.8	3.0
	Type house/typesetter	8	4.7	4.3	9.7	3.8	3.0
	Photography	4	2.3	2.2	0.0	3.8	3.0
	Specialty printer	2	1.2	2.2	0.0	0.0	1.5
	Other	14	8.2	4.3	6.5	7.7	11.9
	Total	171	100.0	100.0	100.0	100.0	100.0
4.)	Which of the following best describes your company's 2003 revenues?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Less than $3 million	52	30.4	34.8	48.4	26.9	19.4
	$3 million to $5 million	29	17.0	23.9	6.5	23.1	14.9
	More than $5M to $10M	24	14.0	10.9	6.5	19.2	17.9
	More than $10M to $15M	19	11.1	10.9	16.1	3.8	11.9

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4.)	*(cont.)* Which of the following best describes your company's 2003 revenues?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	More than $15M to $20M	6	3.5	6.5	3.2	0.0	3.0
	More than $20M	33	19.3	8.7	16.1	19.2	28.4
	Don't know/refused	8	4.7	4.3	3.2	7.7	4.5
	Total	171	100.0	100.0	100.0	100.0	100.0
5.)	What percent of revenue was from variable data print jobs?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		162	20.9	8.0	18.8	22.8	30.7
6.)	How many employees are in your company?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		171	254	70	81	183	491
7.)	How many facilities do you have in separate locations?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		171	2.4	1.5	1.4	2.3	3.6
8.)	How many employees do you have in each of the following functions?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
	Production	161	39	30	37	25	52
	Prepress	162	8	12	5	5	7
	IT	162	7	2	3	4	14
	Sales	162	13	7	5	8	24
	Customer service	163	9	4	6	8	15
9.)	What was your percent growth in revenues over the last 12-month period?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		149	13.2	11.8	9.1	13.3	16.3
10.)	What percent of your:	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
	printing is monochrome?	171	56.0	58.0	54.0	58.5	54.6
	variable data printing jobs are monochrome?	168	44.8	43.0	46.0	43.2	46.1
11.)	Of all of the variable data printing jobs you do, what is the mix in terms of the following six types?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Versioning						
	Major	76	44.4	0.0	100.0	3.8	65.7
	Minor	61	35.7	50.0	0.0	57.7	34.3

11.)	*(cont.)* Of all of the variable data printing jobs you do, what is the mix in terms of the following six types?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Not at all	33	19.3	50.0	0.0	38.5	0.0
	Don't know/refused	1	0.6	--	--	--	--
	Total	171	100.0	100.0	100.0	100.0	100.0
	Mail merge						
	Major	105	61.4	58.7	48.4	19.2	85.1
	Minor	47	27.5	21.7	38.7	57.7	14.9
	Not at all	19	11.1	19.6	12.9	23.1	0.0
	Total	171	100.0	100.0	100.0	100.0	100.0
	Personalized printing						
	Major	98	57.3	43.5	32.3	46.2	82.1
	Minor	60	35.1	41.3	61.3	38.5	17.9
	Not at all	13	7.6	15.2	6.5	15.4	0.0
	Total	171	100.0	100.0	100.0	100.0	100.0
	Transaction printing						
	Major	14	8.2	4.3	6.5	11.5	10.4
	Minor	65	38.0	10.9	22.6	34.6	64.2
	Not at all	92	53.8	84.8	71.0	53.8	25.4
	Total	171	100.0	100.0	100.0	100.0	100.0
	Internet on-demand						
	Major	45	26.3	0.0	0.0	65.4	41.8
	Minor	62	36.3	4.3	35.5	34.6	58.2
	Not at all	64	37.4	95.7	64.5	0.0	0.0
	Total	171	100.0	100.0	100.0	100.0	100.0
	Fully customized communications						
	Major	49	28.7	4.3	3.2	42.3	50.7
	Minor	72	42.1	30.4	48.4	38.5	49.3
	Not at all	50	29.2	65.2	48.4	19.2	0.0
	Total	171	100.0	100.0	100.0	100.0	100.0
12.)	Of the job types you indicated that were a "major" portion of the variable data jobs you print, please tell me which one is the largest portion?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Versioning	24	14.0	0.0	51.6	0.0	11.9
	Mail merge	50	29.2	52.2	35.5	3.8	20.9
	Personalized printing	35	20.5	26.1	6.5	19.2	22.4
	Transaction printing	6	3.5	2.2	6.5	3.8	3.0
	Internet on-demand	23	13.5	0.0	0.0	38.5	19.4
	Fully customized communications	18	10.5	4.3	0.0	23.1	14.9

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12.)	*(cont.)* Of the job types you indicated that were a "major" portion of the variable data jobs you print, please tell me which one is the largest portion?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	None marked "major"	9	5.3	15.2	0.0	7.7	0.0
	Don't know/refused	6	3.5	0.0	0.0	3.8	7.5
	Total	171	100.0	100.0	100.0	100.0	100.0
13.)	What percent of the respondents indicated that each of the following are a moderate to large challenge that they face in implementing variable data print programs?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Poor quality of data on the client side	170	80.6	80.4	77.4	88.5	79.1
	Variable data software is too complicated	170	31.8	34.8	29.0	46.2	25.4
	Need for customized software to be written	170	37.6	32.6	25.8	38.5	46.3
	Access to digital assets such as graphics, photos	170	38.2	32.6	32.3	38.5	44.8
	Clients do not have a retention or customer relationship strategy	170	82.9	80.4	83.9	73.1	88.1
	Communicating the value to our customers of ROI benefits of personalization	170	84.1	87.0	90.3	65.4	86.6
	Merging the client's database with variable data software	170	31.2	43.5	35.5	34.6	19.4
14.)	You may frequently see these following marketing programs among the variable data print jobs you do. Of these, which do you see most frequently?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Seeking new customers	67	39.2	45.7	41.9	46.2	31.3
	Retaining or building loyalty among existing customers	90	52.6	47.8	51.6	34.6	62.7
	Completing transactions or billing	7	4.1	2.2	3.2	11.5	3.0
	Don't know/refused	7	4.1	4.3	3.2	7.7	3.0
	Total	171	100.0	100.0	100.0	100.0	100.0
18.)	Do you focus on specific vertical industries when you sell your variable data printing services?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Yes	79	46.2	41.3	45.2	57.7	46.3
	No	90	52.6	56.5	54.8	42.3	53.7
	Don't know/refused	2	1.2	2.2	0.0	0.0	0.0

18.)	*(cont.)* Do you focus on specific vertical industries when you sell your variable data printing services?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Total	171	100.0	100.0	100.0	100.0	100.0
	Which ones are most important to your business?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Financial services/insurance	46	20.2	18.8	21.9	18.6	21.0
	Education, charity or not-for-profit	31	13.6	14.6	12.5	11.6	14.3
	Manufacturing	42	18.4	18.8	25.0	18.6	16.2
	Health care	31	13.6	10.4	18.8	11.6	14.3
	Entertainment/gaming	15	6.6	8.3	3.1	4.7	7.6
	Retail	35	15.4	14.6	12.5	16.3	16.2
	Catalog/direct	10	4.4	0.0	3.1	11.6	3.8
	Government	2	0.9	2.1	0.0	0.0	1.0
	Technical	2	0.9	2.1	0.0	0.0	1.0
	Utilities	1	0.4	2.1	0.0	0.0	0.0
	Hospitality/travel/tourism	4	1.8	4.2	0.0	0.0	1.9
	Publishing/advertising/communications	4	1.8	0.0	3.1	4.7	1.0
	Other	5	2.2	4.2	0.0	2.3	1.9
	Total	228	100.0	100.0	100.0	100.0	100.0
	From which two do you derive the greatest revenue?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Financial services/insurance	19	22.9	12.5	0.0	30.0	27.5
	Education, charity or not-for-profit	11	13.3	18.8	14.3	0.0	17.5
	Manufacturing	18	21.7	31.3	28.6	25.0	15.0
	Health care	11	13.3	6.3	28.6	15.0	12.5
	Entertainment/gaming	4	4.8	6.3	0.0	0.0	7.5
	Retail	10	12	18.8	14.3	15.0	7.5
	Catalog/direct	3	3.6	0.0	0.0	10.0	2.5
	Government	1	1.2	0.0	0.0	0.0	2.5
	Hospitality/travel/tourism	1	1.2	0.0	0.0	0.0	2.5
	Publishing/advertising/communications	3	3.6	0.0	14.3	5.0	2.5
	Other	2	2.4	6.3	0.0	0.0	2.5
	Total	83	100.0	100.0	100.0	100.0	100.0

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19.)	For your most recent variable data client, what is the title of the person who made the decision to conduct a personal campaign?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Marketing manager/coordinator/director	64	37.2	37.0	22.6	23.1	50.0
	Account executive/manager/project manager	8	4.7	4.3	12.9	0.0	2.9
	Art director/creative director	3	1.7	2.2	0.0	3.8	1.5
	CEO/COO/owner/president	16	9.3	4.3	12.9	7.7	10.3
	Production manager	4	2.3	8.7	0.0	0.0	0.0
	Vice president of marketing/sales	19	11.0	2.2	9.7	15.4	16.2
	Human resources	3	1.7	0.0	0.0	11.5	0.0
	Sales manager	3	1.7	0.0	6.5	3.8	0.0
	Buyer	4	2.3	4.3	3.2	3.8	0.0
	Executive/administrator	2	1.2	0.0	0.0	7.7	0.0
	Other manager	4	2.3	2.2	6.5	3.8	0.0
	Other	9	5.2	8.7	3.2	3.8	4.4
	Don't know/refused	33	19.2	26.1	22.6	15.4	14.7
	Total	172	100.0	100.0	100.0	100.0	100.0
20.)	What percent of the variable data print jobs that you do are for an ad agency on behalf of their client?	Count	Mean	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		168	19.7	17.8	23.7	17.8	20.2
21.)	What makes of digital printing presses do you currently own?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Canon	25	6.7	10.3	6.7	3.4	6.0
	Epson	1	0.3	0.0	0.0	1.7	0.0
	Heidelberg	40	10.7	11.5	10.0	8.6	11.4
	hp indigo	60	16.1	13.8	18.3	17.2	15.6
	IBM	3	0.8	0.0	0.0	1.7	1.2
	Konica	3	0.8	0.0	1.7	1.7	0.6
	Minolta	1	0.3	0.0	0.0	0.0	0.6
	NexPress	20	5.4	2.3	11.7	1.7	6.0
	Oce	5	1.3	1.1	0.0	1.7	1.8
	Ricoh	5	1.3	2.3	1.7	3.4	0.0
	Scitex	3	0.8	0.0	0.0	0.0	1.8
	Xeikon	25	6.7	5.7	15.0	6.9	4.2
	Xerox	165	44.2	44.8	31.7	44.8	48.5
	Other	13	3.5	5.7	3.3	6.9	1.2

21.)	*(cont.)* What makes of digital printing presses do you currently own?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Don't know/refused	4	1.1	2.3	0.0	0.0	1.2
	Total	373	100.0	100.0	100.0	100.0	100.0
22.)	Do you also own offset equipment?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Yes	119	69.6	73.9	64.5	65.4	70.2
	No	51	29.8	26.1	35.5	30.8	29.9
	Don't know/refused	1	0.6	0.0	0.0	3.8	0.0
	Total	171	100.0	100.0	100.0	100.0	100.0
23.)	What variable information software are you using?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Darwin from Creo	13	7.6	10.9	6.5	3.8	7.5
	DesignMerge Solutions from Banta Integrated Media	9	5.3	6.5	3.2	0.0	7.5
	Dialogue from Exstream Software	4	2.3	0.0	0.0	3.8	4.5
	DL Formatter from Datalogics	9	5.3	0.0	3.2	0.0	11.9
	MPower from Pageflex	1	0.6	0.0	0.0	3.8	0.0
	NexTreme from Heidelberg	2	1.2	0.0	0.0	0.0	3.0
	pdfExpress from think121	2	1.2	0.0	0.0	3.8	1.5
	Persona from Pageflex	1	0.6	0.0	0.0	3.8	0.0
	PersonalEffect from XMPie	1	0.6	0.0	0.0	0.0	1.5
	Personalizer-X from TechnoDesign	11	6.4	4.3	9.7	7.7	6.0
	PlanetPress3 from Objectif Lune	3	1.8	4.3	3.2	0.0	0.0
	PreS from Printsoft Americas	2	1.2	0.0	0.0	3.8	1.5
	PrintNet from GMC Software Technology	5	2.9	2.2	3.2	0.0	4.5
	PrintShop Mail from Atlas Software	12	7.0	4.3	12.9	7.7	6.0
	VIPP from Xerox Corporation	10	5.8	4.3	9.7	3.8	6.0
	Vitesse from Elixir Technologies Corp.	2	1.2	2.2	0.0	0.0	1.5
	Yours Truly from hp indigo	25	14.6	15.2	16.1	11.5	14.9
	Custom developed software	14	8.2	2.2	6.5	19.2	9.0
	X Data by EM Software	6	3.5	4.3	9.7	0.0	1.5
	Microsoft Word	5	2.9	0.0	3.2	11.5	1.5
	Quark	2	1.2	2.2	0.0	3.8	0.0
	File Maker	2	1.2	0.0	3.2	0.0	1.5
	Adobe	3	1.8	2.2	3.2	3.8	0.0
	Other	8	4.7	8.7	3.2	3.8	3.0

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23.)	*(cont.)* What variable information software are you using?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Don't know/refused	19	11.1	26.1	3.2	3.8	6.0
	Total	171	100.0	100.0	100.0	100.0	100.0
25.)	What was your total initial investment for the press to get started with variable data printing?	Count	Mean (5% trimmed)	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		140	$282,516	$202,097	$309,805	$520,735	$908,833
26.)	What was your total initial investment for the software to get started with variable data printing?	Count	Mean (5% trimmed)	Level 1 (C3) Mean	Level 2 (C4) Mean	Level 3 (C1) Mean	Level 4 (C2) Mean
		144	$34,775	$9,973	$12,796	$49,182	$56,259
27.)	In what year did you make this initial variable data printing investment?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Don't know/refused	4	2.3	6.5	0.0	0.0	0.0
	1980	1	0.6	0.0	0.0	3.8	0.0
	1981	1	0.6	0.0	0.0	0.0	1.5
	1984	1	0.6	0.0	0.0	0.0	1.5
	1985	2	1.2	0.0	0.0	0.0	3.0
	1986	1	0.6	0.0	0.0	0.0	1.5
	1987	2	1.2	2.2	0.0	0.0	1.5
	1989	2	1.2	0.0	0.0	3.8	1.5
	1991	2	1.2	0.0	0.0	0.0	3.0
	1992	3	1.8	0.0	0.0	7.7	1.5
	1993	1	0.6	0.0	0.0	0.0	1.5
	1994	7	4.1	0.0	3.2	11.5	4.5
	1995	11	6.4	6.5	9.7	0.0	7.5
	1996	16	9.4	10.9	6.5	11.5	9.0
	1997	7	4.1	2.2	6.5	0.0	6.0
	1998	20	11.7	6.5	22.6	7.7	11.9
	1999	20	11.7	13.0	12.9	15.4	9.0
	2000	13	7.6	6.5	6.5	7.7	9.0
	2001	19	11.1	15.2	6.5	15.4	9.0
	2002	23	13.5	23.9	9.7	11.5	9.0
	2003	13	7.6	6.5	12.9	3.8	7.5
	2004	2	1.2	0.0	3.2	0.0	1.5
	Total	171	100.0	100.0	100.0	100.0	100.0

28.)	Did you make additional technology investments as part of your initial start-up in variable data printing? If so, what was the cost?	Count	Mean (5% trimmed)	Level 1 (C3) Mean (5% trimmed)	Level 2 (C4) Mean (5% trimmed)	Level 3 (C1) Mean (5% trimmed)	Level 4 (C2) Mean (5% trimmed)
	Additional hardware investment		$11,429	$4,304	$5,914	$15,748	$18,342
	Total additional software investment		$14,429	$2,664	$2,366	$35,517	$29,705
	Total network/telecom/Internet investment		$6,484	$2,495	$1,892	$8,124	$16,738
	Database investment		$1,820	$174	$785	$2,051	$5,411
	Other investment		$716	$0	$1,487	$8,120	$1,294
	Total infrastructure investment		$416,250	$202,097	$309,805	$520,735	$908,833
29.)	Have you heard of an ASP (Application Service Provider) business model for digital printing?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Yes	96	56.1	34.8	54.8	69.2	65.7
	No	75	43.9	65.2	45.2	30.8	34.3
	Total	171	100.0	100.0	100.0	100.0	100.0
	If yes, have you ever considered using one to implement your variable data programs to current or new customers?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Yes	55	57.3	50.0	58.8	50.0	61.4
	No	40	41.7	50.0	41.2	44.4	38.6
	Don't know/refused	1	1.0	0.0	0.0	5.6	0.0
	Total	96	100.0	100.0	100.0	100.0	100.0
30.)	Besides printing, what other services do you provide for variable data printing jobs?		Percent of total 170	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Creative support		70.6	63.0	61.3	76.9	76.1
	Database management		71.7	56.5	67.7	73.1	83.6
	Finishing options		94.1	89.1	95.8	92.3	95.5
	Kitting, fulfillment and distribution,		87.1	71.1	90.3	84.6	95.5
	Mailing support including sorting and meeting postal regulations		84.7	67.4	87.1	88.5	92.5
	Response measurement		36.5	15.2	22.6	42.3	55.2
	Telemarketing		11.8	4.3	6.5	15.4	17.9
	Data mining		32.9	15.2	12.9	42.3	50.7
	List management		47.1	30.4	45.2	57.7	55.2
	Email marketing		32.4	21.7	9.7	38.5	47.8
	Don't know/refused		1.7	4.3	0.0	3.8	0.0

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31.)	How do you charge for these ancillary services? Is it typically built into the cost of the printing job or do you bill separately for each service?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Built into cost	46	26.9	37.0	35.5	23.1	16.4
	Bill separately for each service	74	43.3	41.3	38.7	46.2	46.3
	Both	46	26.9	17.4	25.8	30.8	32.8
	Neither	2	1.2	2.2	0.0	0.0	1.5
	Don't know/refused	3	1.8	2.2	0.0	0.0	3.0
	Total	171	100.0	100.0	100.0	100.0	100.0
32.)	Do you typically measure the success of their variable data printing jobs for your customer?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	Yes	39	22.8	15.2	9.7	26.9	32.8
	No	132	77.2	84.8	90.3	73.1	67.2
	Total	171	100.0	100.0	100.0	100.0	100.0
	If no, do you know who does?	Count	Percent	Level 1 (C3) Percent	Level 2 (C4) Percent	Level 3 (C1) Percent	Level 4 (C2) Percent
	The customer	73	55.3	48.7	57.1	57.9	57.8
	A third party	3	2.3	5.1	0.0	0.0	2.2
	In-house	2	1.5	0.0	3.6	5.3	0.0
	No one	1	0.8	0.0	0.0	0.0	2.2
	Someone else	1	0.8	0.0	0.0	0.0	2.2
	Data mining company	1	0.8	0.0	0.0	0.0	2.2
	Don't know/refused	51	38.6	46.2	39.3	36.8	33.3
	Total	132	100.0	100.0	100.0	100.0	100.0

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