



EMERGING TECHNOLOGY IN THE FORMS INDUSTRY

INFORMATIONAL ARTICLE

EMERGING TECHNOLOGIES in the FORMS INDUSTRY

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Introduction:

The forms industry is no stranger to technology and change. Throughout the history of the modern forms industry, technology has had a major impact. Inventions in paper technology included carbonless paper, laser paper, inkjet paper, security paper, and more. Improvements in ink, printer technology, manufacturing processes, and pre-and post-processing equipment have created both challenges and opportunities. Distributors and manufacturers have met these challenges with new products, new services, and new distribution systems. Yet, the past decade has seen dramatic changes in the make-up of the industry, its participants, and its customers.

Forward-thinking companies are always looking to new technology for opportunities to reduce costs, improve service and provide new revenues through new products. Most such technologies require significant investment in products, people, and training. Some succeed, others fail to achieve their potential and some fail altogether. The challenge is to pick the winners from the losers.

This paper examines some of the emerging technologies that show promise for industry participants, along with links to sources for more detailed information. Certainly, this is not an exhaustive list and other technologies may also emerge. Nonetheless, the technologies discussed herein represent an opportunity for distributors and manufacturers.

Finally, we briefly present three possible future scenarios for consideration. Regardless of the future outcome, it will be a period of rapid changes, perhaps even more daunting than the past decade. Keeping up becomes more important – and more difficult. The penalty for being wrong gets harsher. No one can simply stand still.

The Technology Conundrum:

Over the past 200 years, technology has impacted the forms and document industry in many ways, but the past decade has brought about revolutionary changes, unlike the previous 200 years. Nothing stays the same and companies that can change easily have a clear competitive advantage. However, change rarely comes easily. This leads to a “technology conundrum.” Continued innovation drives change in business. Exponential improvements in efficiency caused by improving technologies create more opportunities. These changes require investment. Investment drives additional changes, and we have a never-ending cycle of change. Add to this the accelerating rate of change that we have experienced lately, and a conundrum develops. Keeping up becomes more and more challenging.

This conundrum is evident within the forms and document industries. Technology has had and continues to have, a significant impact on the way our customers do business and the type of forms they use. Traditional forms products have matured and are in decline. Distributors and manufacturers have responded by changing their definition of the industry, adding more products, and adopting technology to meet changing demands. As customers adopt new technologies, distributors, and manufacturers must continue to change their business strategies and investment.



One visible impact of this changing environment is the very definition of our industry. Forms have been downplayed and the term “document” now prevails. The result is an expanded view of the products and services offered by industry participants. We no longer sell just business forms, but related products such as labels, direct mail, commercial printing, and promotional printing. In fact, business forms have become less than 50% of what industry participants sell.

Before we begin, some definitions are in order. We define “document” as “a container of information.” This wide-open view means that just about anything qualifies as a document including brochures, labels, emails, memos, reports, signs, forms, and much more. A “form” is a specialized document with fields for variable data input or display. A “record” is an instance of a document for a specific transaction or subject. Therefore, document management, forms management, and records management are different and separate disciplines but with considerable overlap and integration.

These definitions become quite important when considering the technologies used within each area. Tools used to design documents may or may not contain features important to forms design and vice versa. Document management systems are generally not efficient with forms management requirements. Emerging technology in one area may have no bearing in other areas.

Notwithstanding the above, there is a trend toward convergence in these three related fields, particularly from an Information Technology (IT) perspective. To some extent, this convergence is natural and relevant. However, the investment and support requirements are substantially different, as is the sales expertise required for each. It is important to consider each area separately.

For our industry, we can point to six seminal events that have brought about this convergence and the revolutionary change that has occurred over the past two decades. These events have rocked the forms industry, impacting all areas of our business. Several megatrends have resulted that have been well-documented, including a trend toward:

- Fewer Plies
- Smaller Sizes
- One-part Forms
- Sheets vs Continuous
- Blank vs Preprinted Forms
- Electronic Format (paper-optional) & Distribution

Evidence of these trends can be found in the efforts of the federal government to reduce or eliminate paper. From the original Hoover Commission on Paperwork Simplification (1955) to the Government Paperwork Elimination Act that goes into effect October 21, 2003, the focus has been to reduce paper. Yet, today more than 90% of all business information is provided or stored on paper.

Historical Perspective:

Carbon Paper (1)

The first of six seminal events was the invention of carbon paper, almost 200 years ago. With this invention, multiple copies of documents could easily be made, which changed the way businesses operated. Transactions could be standardized, with copies provided to customers and departments. Think of the implications of this technology – new filing systems, new production capabilities, more efficient business systems, and more. The forms industry embraced this technology – in fact, this breakthrough can be credited with creating the forms industry.

Mainframe Computer (2)

The invention and widespread installation of mainframe computer printers created a demand for continuous forms and enabled the industry to establish itself as a true force. Forms companies responded and the industry grew to a multi-billion-dollar industry.

All-Points-Addressable Printer Technology (3)

The introduction of all-points-addressable printer technology made printers “graphics-enabled” and changed forever the way IT departments viewed forms. The attitude was that both the container and the variable data could be generated simultaneously, and pre-printed forms could be eliminated. Multiple-part forms were not needed in this environment, as most of the technology was non-impact printing. This attitude had a major impact on our industry and includes the introduction of the “Electronic Print Shop” concept, fueled by the introduction of the Xerox Docutech. The impact was the convergence of the in-plant print shop and the IT print department into one output center. As a result, offset printing declined, form sizes became more standardized and smaller, and the demand for multiple-part forms began to decline substantially.

Personal Computer (4)

With the introduction and phenomenal growth of the personal computer and the decentralized printers that came with them, PCs changed the way businesses operated and spawned additional technologies such as desktop publishing that changed the manner of print output.

Electronic Forms Technology (5)

Beginning with software that helped create forms for the Xerox 9700, IBM 3800 and similar printers, electronic forms (eForms) software quickly became WYSIWYG, and “everyone became a forms designer.” Companies adopted a “paperless” mentality, users created their own forms and, as a result, demand for preprinted forms declined.

Browser Software (6)

For the first time, the Internet was made available to non-technical people and resulted in an explosion of the World Wide Web. Users could now interact directly with a server and submit data directly to a database. This technology is still in its early stages of adoption and has already begun to impact the way people view forms.



In addition to these major events, we have experienced general advances in forms technology, including electronic commerce, Electronic Data Interchange (EDI), Electronic Bill Presentment and Payment (EBPP), desktop printers with MICR capability, pre-and post-processing equipment for high-speed printers, advancements in bar codes, new secure document features and incremental press improvements to name just a few.

From this turmoil, the need to embrace change by carefully reviewing emerging technologies, changing business strategies, and providing employee training while investing in technology has never been greater.

Role of Innovators:

Innovators can be a major pain for many organizations. They challenge the status quo, create disruption, push hard for their ideas, and generally make organizations uncomfortable. Yet, they can drive investments, change attitudes, and create opportunities. The very survival of an organization may very well depend upon how successful such people are in “selling” their ideas, yet the true visionary is often misunderstood and underappreciated.

Innovators can be the business owner, CEO, or just about anyone within the organization, but certain characteristics are generally present. They seem to have a capacity for asking challenging questions, such as “Why?” and “Why not?”. They can be cynical of the status quo, yet optimistic about the future. They can be viewed as argumentative, even dogmatic, about their view of the future. They sometimes hold those that do not share their vision in disdain, thereby alienating colleagues and even customers. Yet, they can frequently paint fascinating views of the opportunities available. They generally do not let setbacks deter them and are not afraid of failure.

The challenge with managing innovators is to recognize opportunity within the context of strategy and available resources, to encourage our innovators without incurring undue business and financial risks. It is the ability to separate failure due to bad ideas from failure due to poor implementation. Increasingly, distributors and manufacturers must make important decisions with incomplete information, as waiting often leads to missed opportunities.

The “safe” way to proceed is to wait for firm customer demand to emerge, then respond to this demand. However, many times this is simply not good enough. By the time a sufficient number of customers have articulated this demand, others have already developed the technology and capabilities and have achieved a competitive advantage. Implementation of emerging technologies implies more risk. However, it can also result in more reward!

The Nature of Forms Technologies:

Generally speaking, technology can be divided into two categories:

- Business Process Improvement, or internal technology that improves customer service, reduces internal processing costs, improves manufacturing or administrative efficiencies, or improves the efficiency of the supply chain.
- Customer-facing, or external technology that can be sold and delivered to customers, resulting in increased revenues and profits.

Further, technology can have an impact in two major areas:

- Incremental technological improvements, resulting in smaller but measurable changes to business systems, products, or the industry as a whole.
- Business-altering technological changes, resulting in “seminal change” within the industry, product, or company.

By studying history, one can often gain insight into the future. This is true within the forms and document industry. Certainly, we can document many changing events and understand their impact on the industry, specific products, and our individual companies. These include enhancements to technologies such as digital printing, inline imaging, Computer-to-Plate (CTP) technology, PDF file format, forms design software, and proofing systems. All these changes have resulted in improvements to our business, but none of them have resulted in seminal change. Of course, it can be argued that some have resulted in major changes to certain businesses. For example, electronic design software, coupled with PDF workflows, has drastically changed graphic design shops.

No list of emerging technologies is a complete list. However, in our view, the following emerging technologies have had, and continue to have, a significant impact on the forms and document industry.

- Business Process Reengineering
- Electronic Forms Technology
- Electronic Commerce
- Radio Frequency Identification (RFID)
- Digital Printing
- Forms Manufacturing and Distribution
- New and Emerging Standards
- Convergence of Disciplines

Business Process Reengineering (1)

Many organizations can improve their competitive advantage by focusing investment on their internal systems such as Enterprise Resource Planning (ERP), Enterprise Content Management (ECM), Enterprise Application Integration (EAI), and process improvement methodology. Today, such investment is less about competitive advantage and more about keeping up. Before allowing customers to access information online, make sure your internal systems are efficient and current. There’s an old saying, “If you automate bad business processes, you simply get bad results quicker.”

There are a number of software-based solutions for internal processing. The ERP systems from SAP, Oracle, J.D. Edwards, Baan, PeopleSoft, and others are comprehensive. Most such systems are relatively expensive and require a high degree of conformance to the software system without customization. Customization creates upgrade and update problems and drives up costs.

ECM systems are useful investments prior to implementing portals or web-based eCommerce solutions. ECM is a group of technologies – “tools and methods that help capture, manage, store, preserve and deliver content in support of business processes” (definition from AIIM website). This includes document capture (scanning, OCR, OMR, ICR, fax capture), digital asset management, document management, records management, web content management, and collaborative tools for document development.

The primary source for content management information is the Association for Imaging and Information Management, now called AIIM International (<http://www.aiim.org>). They list over 100 companies that offer products and services for content management.

EAI is a group of technologies that facilitate the integration of host systems, web applications, and other business process systems. They help integrate people, processes, and systems that allow companies to provide dynamic online solutions and integration for the presentation of information to customers and employees. Think of it as a behind-the-scenes suite of software products that make all your applications talk with each other and work together without requiring a costly rewrite of existing software.

Table 1 provides a list of companies that provide EAI solutions.

Business process improvement is a general term that describes methodologies and software to analyze, document, and redesign business processes such as order processing, accounts payable, shipping, and many others. Many tools exist to support business process improvement. One of the leading firms within the forms industry is The Ben Graham Corporation (<http://www.worksimp.com/>).

Prior to consideration of any solution, we recommend a complete review of the major business processes for the business, with the goal of improving all processes as much as possible. This review does not require software investment but usually requires employee training and/or outside consulting assistance.

Electronic Forms Technology (2)

It is likely that no other technology has had as much attention, hype, and promise with so few actual results as electronic forms. This is not to say that eForms haven't had any impact – we argue that they have had a significant impact – but most distributors and manufacturers have yet to embrace the technology or figure out how to make a profit with it.

Electronic forms were first introduced in the mid-1980s, with technology from companies such as Tyrego Technology Corp., Delrina Corp., BLOC Development Corp. (F3 ProDesigner) and JetForm Corp. Most such products consisted of a designer module and filler (client) modules. End-users were required to license the filler software for each PC. Both costs and complexity prevented many companies from licensing the software and the market for specialized electronic forms software remained relatively small.

Over the past decade, many companies have come and gone. JetForm (the largest) acquired Delrina, changed their name to Accellio, and has been acquired by Adobe Systems, Inc. BLOC Development was sold and eventually disappeared from the marketplace (although there are still many users of the F3 ProDesigner software). Shana Corp was recently acquired by FileNet Corp., a document management company. Microsoft Corp. has introduced a forms product, InfoPath, which will be integrated with Microsoft Office 2003.

Today, there are approximately 28 companies that offer specialized forms software for creating electronic and Internet (browser-based) forms. We estimate the total revenues generated by these companies for their electronic forms products to be less than \$500 million, with the majority of that revenue generated by Adobe Systems, Inc. See Table 2 for a list of companies.

Adobe Systems, Inc. is the market leader for electronic forms. Their acquisition of Accellio provided them with design software and a large customer base. We believe that Adobe is revamping the old JetForm Designer product and will release a new designer within the next few months. We also believe they will phase out JetForm and Delrina technology and replace it with Adobe-developed products.

Microsoft Corporation is re-entering the forms market with InfoPath, their XML-based designer. This product will be sold separately but will also be integrated with the new release of Microsoft Office 2003. Microsoft's presence in the eForms marketplace indicates they believe it will be big, and their offering will generate a lot of interest.

Most electronic forms in use today were created using general-purpose software such as Microsoft Word, Quark, PageMaker, etc. Many times, such files are distilled as PDF forms for actual distribution to end-users. A survey of State government websites reveals thousands of forms available to the public, with the vast majority of the forms, well over 90%, and other documents available as "Print Only" files (usually PDF). A small, but growing number of

forms are available as “Fill and Print” forms (also usually PDF). There are occasional forms available in other formats such as Word or Excel. This appears to be state-of-the-art, at least for public-facing forms.

Public-facing forms generally are limited to “Print Only” or “Fill and Print” because of limitations in the forms software. End-users cannot be required to install fillers. The free Acrobat Reader does not allow users to save locally. Users generally resist filling out forms they cannot save, particularly if the forms are complicated and require multiple sessions to complete. Word files are large, and many users do not want to send or receive such files for fear of spreading a virus. Plus, Word files can be transmitted only by attachment to an email and do not place data directly into a database. Finally, users may be operating on widely different editions of the software, different operating systems, and various browsers.

Internally used forms are another story. In a controlled network environment, fillers can be automatically downloaded, and license costs controlled. Some software products don’t require filler licenses. Organizations can achieve the benefits of database-connected forms and business processes can be quickly automated. To some extent, software editions are standardized throughout the enterprise, as are operating systems and browsers.

A careful look at electronic forms technology reveals that it actually consists of several technologies. These include eXtensible Markup Language (XML), browsers, Hypertext Markup Language (HTML), JavaScript, server scripts (Perl, Active Server Pages [ASP], Java Server Pages [JSP], and others), and other related software languages.

Companies that wish to provide electronic forms services must invest in resources that can develop such code. They must understand server setup (including scripts) and database technology. Without a doubt, XML is emerging as one of the most important technologies and it is already widely used in most eForms solutions. Understanding XML is a key to success in this arena.

Many issues remain and must be resolved before electronic forms can successfully be implemented. These include compatibility (Mac versus PC, Internet Explorer [the dominant browser], versus Netscape and others, database connectivity, server compatibility), deployment complexity, electronic signatures, data security, and more.

Electronic Commerce (3)

Electronic commerce technology is important to all businesses. This certainly includes distributors and forms manufacturers. Customers expect to have access to order data, account information, inventory availability, and invoicing. They expect to be able to conduct business with their suppliers online.

Internally, companies are restructuring their systems to support customer expectations. In addition, Customer Relationship Management (CRM) systems enable a level of personal service not previously achievable. The ability to learn more about customers, their buying patterns, interests, and preferred methods for doing business helps establish a competitive advantage. Such systems will be vital in the near future.

Over the past decade, several print-related eCommerce companies have emerged. Some have been acquired, such as ImageX.com (Kinko’s), Impresse Group (PrintCafe), and printChannel (PrintCafe). Many have also faded and failed. It can be argued that many were simply ahead of the market, undercapitalized, and unable to find a market. However, each has provided valuable lessons and technology, blazing a trail for those that follow.

It seems relatively certain that eCommerce is here to stay. Companies that plan to prosper ignore these systems at their peril. However, careful selection of an eCommerce solution is critical and implementation that is evolutionary in nature seems to be preferred over massive, enterprise-wide solutions that are expensive, complex, and disruptive.

We have identified a number of companies that currently offer print-related eCommerce solutions (Table 3). No doubt, others also exist. Others will rise, and some will fail. An understanding of your company’s strategic strengths is essential in selecting your provider.

Once again, emerging technologies that impact eCommerce need to continue to develop and improve before eCommerce solutions achieve their promise. These include electronic signatures, data security, privacy capabilities, non-repudiation techniques, portal technology, and online payment systems.

Radio Frequency Identification (RFID) (4)

RFID is certainly getting a lot of attention lately. These so-called “smart labels” have the potential to revolutionize product labeling, shipping, inventory management, medical records, and a lot more. They are also generating a lot of controversy and resistance from privacy advocates.

The concept behind RFID is simple. Small chips are embedded into a label, form, product packaging, animals, and some fear, people. This chip can be programmed to contain a variety of data and can be read by remote devices. The advantages are obvious – the label or product can contain a lot of information and can signal its presence to the reader by, among other things, giving location, production date, and purchase data. It can make shipment tracking easier, more accurate, and more timely. It can also store purchase data, which enables tracking consumer purchase behavior and activity.

The current state of the technology is fraught with problems. In addition to active resistance from privacy groups, the technology is expensive, difficult to manufacture, has incompatible technologies (lack of standards) and has relatively high error rates. Regardless, some herald it as the replacement for bar codes and expect it to be the tracking technology of the future.

The Electronic Product Code network is a system designed to number all RFID-tagged items uniquely and connect them to computer databases via the Internet. Recently, an Electronic Product Code symposium was held in Chicago to gather together key decision-makers with vendors committed to increasing the reach of RFID technology. The American Civil Liberties Union (ACLU) was there, opposing the use of RFID devices to tag and track consumer items.

Likely, RFID technology will grow rapidly over the next few years as standards are created, costs decline, and privacy issues are addressed and mitigated. Already, Wal-Mart, the world’s largest retailer, is implementing a plan to force its suppliers to tag their warehouse pallets and containers with RFID tags. This emerging technology represents a growth opportunity for forms manufacturers and distributors.

Digital Printing (5)

The Xerox DocuColor iGen3 Digital Production Press is one example of technological improvements in digital color printing. In the near future, digital printing is expected to supplant offset printing as the dominant printing technology. In addition to Xerox, Heidelberg, Hewlett Packard, Canon, Ricoh and a host of others continue to innovate in this important technology. This has and will continue to have, a profound impact on the production of business forms.

Since the introduction of All-Points-Addressable printers, digital printing has steadily eroded offset printing for the production of forms. Although cost-effective only in short-run quantities, digital printing supports on-demand production, distributed printing, variable printing, and convenience. It is compelling technology and one that supports electronic forms adoption.

Major advances in digital printing technology, created by companies such as Indigo (acquired by HP) and Xeikon (www.xeikon.com) generated considerable interest in color digital printing, but the overall market has been characterized by slower-than-expected growth. However, technology continues to improve and costs continue to decline.

The emerging technological advances in digital printing are generally incremental in nature. Improvements in color quality, speed, cost per page, pre-and post-processing systems, and connectivity are combined to increase user acceptance. The concept of “pleasing color” continues to gain acceptance and many users ignore the differences between offset and digital.

Forms Manufacturing/Distribution (6)

Most emerging technologies in the forms manufacturing and distribution segment are also incremental in nature. Advances in Computer-to-Plate systems, pre-press technology (including PDF Proofing Workflows), digital presses,

in-line imaging, and secure document technology continue to be introduced and implemented, resulting in lower costs and improved efficiency.

Investment in work improvement technologies such as print eCommerce, ERP systems, EAI, and others represent an important option for manufacturers. Automated distribution systems that rely less on the physical distribution of forms and more on digital distribution will continue to have an impact. Warehouse automation, with modern picking solutions, is also important.

Re-purposing forms manufacturing equipment to produce new products such as RFID labels, variable printed products, and complex mail pieces is also an investment opportunity.

Standards (7)

As is frequently the case, new technologies create a need for new standards. Old standards cease to apply, proprietary technologies emerge, and integration difficulties proliferate, creating a demand for new standards. The forms industry is experiencing this evolution and new standards are beginning to emerge. These include XForms, PrintTalk, and Job Description Format (JDF).

XForms. This is the “World Wide Web Consortium (W3C) name for a specification of Web forms that can be used for a wide variety of platforms including desktop computers, handhelds, information appliances, and even paper. Xforms started life as a subgroup of the HTML Working Group, but has now been spun off as an Independent Activity.” For the latest information, visit <http://www.w3c.org/MarkUp/Forms>.

This standard is supported by several forms companies, including Adobe and PureEdge, and is supported by IBM Corp. It is now in the “Proposed Recommendation” stage and could be approved soon. Once adopted, this standard should help electronic forms developers standardize products and promote adoption.

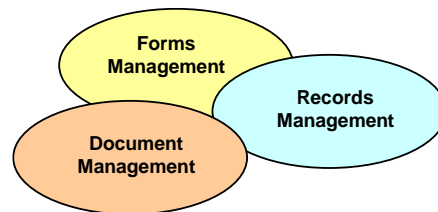
PrintTalk. This is a “community formed by print management systems and e-commerce companies to define a ‘best practice’ common and open communications interface between their products.” Its members include DMIA, Heidelberg USA, Noosh, <http://www.printtalk.org>, and other print commerce companies. Visit <http://www.printtalk.org> for more information on their work. Also, visit <http://www.ipa.org> (The Association of Graphics Solutions Providers) for information on technology and management innovations specific to the graphics arts industry.

Job Description Format (JDF). This is “a comprehensive XML-based job ticket standard” specific to the printing industry. Visit <http://www.cip4.org> for more information. This proposed standard is supported by many large companies, including Heidelberg, IBM, Creo, Agfa, Xerox, PrintCafe Software, Adobe, MAN Roland, Hewlett Packard, Muller Martini, and others.

With JDF, companies can streamline the entire process of producing printed products and be assured that competing products conform to a standard interface, allowing for the integration of disparate products.

Convergence of Disciplines (8)

Convergence is a phenomenon rooted in digital technology, the explosion of bandwidth, and ever-increasing capabilities. These technologies make it possible to process larger and larger amounts of information and to do more with less. The resulting productivity increases enable businesses to hold the line on costs and to keep inflation under control even in a rapidly expanding economy.



One of the important macro trends affecting the forms and document industry is the trend toward convergence of forms management, document management, and records management. Each of these disciplines is unique in goals, methodology, and tools, but many companies are beginning to combine these functions. The results are frequently less than desirable.

Tools created for document management usually do not provide effective forms management. The same is true for records management software. Of course, forms management software doesn't do well at document or records management. The point is that each is different and requires its own specialized tools. This may change someday, but it hasn't happened yet.

The trend toward convergence is important to distributors and manufacturers because it is important to customers.

Current Market Data and Forecast:

The FormTrac '03 Report from DMIA provides considerable data on the growth and direction of the printed forms market in the United States. It indicates steady declines for traditional printing and slow growth for related products. It does not consider the market for electronic forms.

We estimate the market for electronic forms (eForms and iForms) and related services to be relatively small and not growing very rapidly. This is not to say that eForms are not being widely adopted – we believe that they are. However, most eForms are created in the general business environment by non-forms specialists using general-purpose software. This limits market opportunities for forms distributors and manufacturers.

One measure of the overall size of the market is to quantify “supply side” participants. These are the companies that provide development software, design services, implementation consulting, and deployment services.

Another large group of participants in this market includes internal forms management departments, forms analysts, and forms designers who are increasingly focused on eForms development. However, many companies have assigned eForms development responsibilities to the IT department, and the measurement of the function is blurred.

Distributors and direct-selling forms companies also participate widely in eForms development, but no reliable data exists as to the extent of this market. It does not appear to be a large function in such companies, although many such companies have invested large amounts of money and resources in the technology over the past 20 years.

Associates Group, Inc. estimates that the total size of the market that is available for forms companies is well under \$500 million. The largest software provider, Adobe Systems, Inc., has stated that it expects to generate \$3 billion in “ePaper” revenues within the next three years, but we believe this has less to do with forms and more to do with general business documents. Adobe's purchase of Accellio in 2002 indicates that their belief in the technology is firm, but it also represents a relatively small revenue number from the industry leader.

Despite this low forecast, we believe opportunities do exist for distributors to participate and achieve profitable sales from eForms products and services. It is a fact that customers want to reduce paper and put data capture and display online. They are doing it in large numbers but are not achieving the full promise of technology due to a lack of standards and a high degree of complexity. All this will continue to improve, and implementations will grow rapidly.

Market Direction:

There are several historical trends that are identifiable and reliable predictors of the future of the forms industry. Many of these are a direct result of emerging technology. Clearly, there is a shift from paper-based forms. eForms, eCommerce, EBPP, EDI, email, and direct database capture systems reduce the demand for paper forms. As eForms technology improves, database-connected forms will further erode demand for paper. Increasingly, IT departments are assuming responsibility for forms and are working to reduce paper-based forms. Development of online forms repositories will enable end-users to develop their own forms “on-the-fly,” using form objects and fields that are pre-defined and enterprise-enabled. Forms portals will improve the deployment of eForms and resolve issues such as security and privacy. Regulatory requirements such as the Sarbanes-Oxley Act, HIPPA, and Section 508 Accessibility requirements will drive incremental improvements to forms technology.

Although the “paperless office” is a myth and not even a valid goal for most organizations, it has popular appeal and will drive investment in technology that at least reduces paper usage and forces forms online.

Future Scenarios:

So, what does the future hold for the forms industry? Will we just have an extension of the past, with more consolidation through acquisition and business failures, declining demand for core forms products, diversification into non-forms products, absorption of the forms function into IT or spread over the general business, and gradual elimination of a discernable forms industry? Or will some other future emerge as a result of technology and changing business environments? Anything is possible, but it is useful to look at three other possible outcomes.

The Year X Scenario (1)

This scenario describes a convergence of current technologies that creates an environment where offset printing becomes irrelevant, users don't care whether their forms and other documents are printed digitally or offset, documents remain digital throughout much of their life cycle and are printed if needed, when needed, where needed, in the exact quantity needed, and at a cost competitive to offset printing. In this environment, proofing is replaced with pre-flighting, pre-flighting systems are improved and pushed down to the document creator, physical warehousing and distribution are replaced by digital warehousing and distribution, production becomes highly decentralized utilizing smaller printing devices, finishing and bindery options are standardized and choices are reduced, and users perceive no real difference in print quality from digital and offset printing.

Several technological improvements are needed to get us to Year X. Although we don't really know when Year X is, we believe the technology currently exists that could get us there in less than a decade. Certainly, cost and user convenience will play important roles. Digital printers, particularly color printers, need to get faster, produce better quality color, and must be fully interconnected (standards). Improvements are needed in design (standards) and pre-flighting. Electronic deployment will need to improve substantially through standards, portal technology, and Internet connectivity. Digital asset management systems will need to get better and become more cost-effective.

Current state technology is already available in each of these areas and is rapidly improving. Year X does not require any breakthrough technology to happen. We believe this to be a very plausible scenario.

Radical Technologies:

This scenario requires a more radical advancement in technology, with new inventions such as electronic ink, portable (non-paper) substrates that function like paper but are reusable and connected, widespread installation of wireless technology (such as the “hot zones” that are currently emerging), and advances in nanotechnology that revolutionizes the way information is disseminated.

Research is currently underway in all the above areas and is exciting to contemplate. About two years ago, leaders from the forms industry were exposed to some of this technology during a visit to the MIT Media Center and Escher Labs. Many articles have been published recently on nanotechnology (working with materials at the atomic level) and the possibilities are endless. Wireless technology already exists that can automatically connect a PC or PDA

device to the Internet when it comes into a hot zone. This enables the device to be updated automatically, creating an online electronic newspaper, email, or reporting system.

Many PDAs currently use forms for data capture and display. As remotely connected devices proliferate, demand for such forms will grow. Forms represent structure for data display and capture and support efficient workflow, so an opportunity exists for forms professionals to exploit this growth.

It is possible that the introduction of radical new technology will completely change the way businesses operate, much like the explosive growth of the World Wide Web over the Internet has changed the way we work.

The IT Takeover (1)

One mega-trend currently evident is the gradual IT takeover of forms departments and forms development, resulting in a “push” to reduce or eliminate paper-based forms and documents and instead input all information in digital format. Forms, in this environment, become little more than frontends to databases, while legal and regulatory requirements change to accept digital records for all transactions. Customer-facing technologies evolve to assure user acceptance of non-paper solutions. Communications techniques evolve to eliminate checks, direct physical mail, and other paper-based communications. Product packaging changes through RFID technology to eliminate pressure-sensitive labels. The focus is on systems and IT technology to resolve all business workflow.

Opportunities for Distributors:

We believe opportunities abound for forward-thinking distributor organizations. Many distributors have been and are, responding to these changes in technology. It begins with careful strategic planning and an assessment of your company’s strengths and weaknesses and a clear vision of the type and scope of business you intend to operate.

All distributors should consider investing in Web technology. This is much more than just building a website, although an effective website can be a great marketing tool. The Web has been called “the great equalizer” in that it enables small companies to compete effectively with large companies. Small companies can become international in scope and present a very positive image to customers and prospects.

Web technology investments should include internal systems such as ECM, ERP, and EAI. Before “going public,” make sure your internal systems are effective and efficient. Again, small companies can be quite effective without spending a lot of money or deploying a large physical presence (sales reps) in the marketplace. Many organizations, such as Intuit, IBM, and Microsoft have affordable small-business solutions.

All companies should consider these investments regardless of size, strategy, or location. Certainly, personal contact with customers is very important. All things being equal, people buy from people they know and like. However, with eCommerce, coupled with CRM and eCommerce, all things are not equal. Companies can build great relationships with customers via the Web and deliver a highly personal level of service (or at least make it feel like personal service!).

Distributors seem to fall naturally into two general categories – Sales Organizations and Forms Organizations. In our view, there are significant differences between the two.

Sales Organizations. Establish great customer relationships and work to find a wide variety of products to satisfy customer needs. They are generally quite comfortable selling tangible products, identifying sources, providing warehousing and distribution services, and delivering great customer service. Their focus is less on providing forms design and analysis, forms management (other than warehouse/inventory management), document management, and electronic forms than it is on supplying printed forms, ad specialties, pressure-sensitive labels, direct mail pieces, commercial printing, envelopes, and other tangible products.

Investment in technology for such companies tends to be centered on internal systems to support product delivery, order processing systems, and online order status systems. They invest in ERP solutions that focus on inventory and procurement efficiency. While they may invest in digital printing capability to support product

production, they generally do not invest substantially in eForms, iForms, and related forms-based technology and support nor do they generally pursue the potential for the revenues in this area.

Additional technology options would include investment in an extranet (organization-to-supplier network) to automate supplier systems and solutions. Making a wide range of products and pricing available online can have a profound result on sales and enhance a company's ability to win market share away from much larger competitors.

Forms Organizations. These also establish great customer relationships but tend to be more focused on operating as the customer's source for all forms, whether they are paper-based or electronic than purely on product sourcing. They provide a range of emerging and traditional forms-related services such as design and analysis (including workflow), forms management, portals, programming, and deployment. They research and provide technology solutions regardless of the "form of the form," but would be less inclined to branch out into other products.

Such companies have many investment opportunities available to them. Like all companies, they need good internal and customer-facing solutions. These companies can invest in eForms solutions, including acquiring the necessary hardware and software. In addition, they should acquire technical knowledge on all aspects of workflow, forms design, forms deployment, database integration, and server functions. They must develop expertise in areas such as Section 508 Accessibility requirements and how to create accessible forms. This will be a huge demand in the near future! Strong knowledge of HIPPA compliance requirements, knowledge of digital signatures, non-repudiation techniques, and security and privacy will be invaluable.

Investment in digital printing solutions, including data management, digital printing, digital asset management, imaging solutions, and merging forms with data represent another great opportunity. There has been considerable writing on this topic throughout the trade press in recent years. Some distributors have exploited this opportunity and created profitable revenue growth. Most have discovered that selling such solutions requires considerable training and specific in-house resources.

In all the above areas of opportunity, small companies can effectively compete with larger firms by adding local service and support capabilities. Investment dollars need not be exorbitant. Staying within scale while ensuring tight systems integration is crucial for profitability.

In the event that full implementation of any emerging technology is deemed to be beyond the desired scope of the organization, it is always possible to provide, instead, a viable resource to the client through partnerships with other vendors whose primary businesses specifically address those disciplines.

Of course, many Distributors operate across both areas. Sales organizations find sources for electronic forms support and forms companies provide a wide range of products.

Distributors can also develop niche expertise such as direct mail, digital printing, and forms management, or they can focus on vertical markets such as medical, distribution, insurance, hospitality, and others. In all cases, it is the business strategy that drives investment in a specific technology. Few distributors are in a position to invest broadly or attempt to provide all solutions to all customers.

Opportunities for Manufacturers:

Manufacturers should also consider investment in internal systems improvement and external customer-facing technology. They should develop web-based solutions that automate all aspects of the business. Making it easy for customers to buy should be a primary goal. Developing eCommerce solutions that can be integrated into customer sites can greatly enhance sales. Of course, extranets to suppliers are also a key component for cost reduction.

Automation of the manufacturing processes is also an important investment opportunity. Customers expect to be able to find information online, such as order status. Driving out delays and inefficient processes can mean the difference between profit and loss – between getting an order and losing it on price. Assuring that all process

systems are fully integrated is a critical consideration. Eliminating the need to re-key any data can reduce errors, costly re-runs and speed up deliveries.

For a manufacturer, investment in new production technology can be costly and risky. It isn't for everyone. Certainly, investment in incremental production technology is required and this entails less risk. However, investment in emerging technologies can require a leap of faith, demanding careful analysis and planning.

Trade manufacturers may have the highest risk. Their frequent complaint is that they don't have access to the end-user and must rely on the distributor customers to sell the products they make. This results in a reluctance to adopt new technology in new product areas or to add new capabilities in existing product areas because of uncertain demand.

Direct-selling manufacturers experience similar constraints. Their sales organizations must be trained and given incentives to sell new products and services, often with less-than-desirable results.

Nonetheless, several emerging technologies represent opportunities. These include investment in digital printing capability, including inline imaging, variable data management, color digital printing, finishing, and mailing services. Several manufacturers have made this investment in the past few years and have successfully transformed their businesses.

Many manufacturers have installed specialized label presses and produce a wide range of products, including barcode imaging, integrated labels, packaging, and more. Label sales continue to grow, albeit at a slower rate than in the past. However, leveraging label production equipment with RFID capabilities can once again drive growth. Branching into product packaging, including prime labels, can be a huge opportunity.

Secure document production is a large market that is rapidly growing. Since September 11, 2001, renewed interest in document security from both government and private sector prospects has been evident. Today, the US Department of Homeland Security is working with industry participants through the Document Security Alliance (DSA), a newly formed association, to develop methods for making important documents more secure. Another new association, the North American Secure Products Organization (NASPO) intends to develop certification and standards for insuring a secure process for document production and delivery. Forms manufacturers can develop secure forms production techniques and secure processes to meet this growing demand.

Manufacturers should consider building eForms distribution networks for digital document production and delivery anywhere in the world. This includes developing digital asset management capability, pre-flight expertise, forms portals, forms repositories, and order processing systems. These networks can be developed by partnering with other printing companies to deliver digital printed documents anywhere and at any time.

Summary:

Of course, all this must be considered in the light of reality. We are a long way from the complete implementation of any of these future scenarios. The foreseeable future includes paper-based forms and documents remaining as the dominant technology, with other technologies scoring incremental gains or achieving niche status. Today, over 90% of all business documents are still on paper. Most digital documents are printed at some point in their life cycle. Technology implementations are still frequently too complex and expensive to implement. User attitudes are still not fully, or even largely, accepting of electronic transactions. Issues of privacy, security, identity theft, legal acceptance of electronic records, standards, and technology adoption rates must be effectively resolved. The task seems daunting and insurmountable. However, one need only look at the past decade to see that the future then was equally uncertain. If there is one certainty, it is that things will change. We must keep up with emerging technology and change, as well, if we are to prosper. Some things never change.

Table 1: Enterprise Application Integration (EAI) Vendors

Company	URL
ANUJ Technologies	www.anuj.com
Axway	www.axway.com
BrickRed Technologies	www.brickred.com
EAI Information Systems	www.eaiinfosys.com
Epicor Software Corp.	www.epicor.com
Ex-Cel Solutions, Inc.	www.excels.com
Metascybe Systems Ltd.	www.metascybe.co.uk
MQ Software	www.mqsoftware.com
Neon Systems, Inc.	www.neonsys.com
Net Solutions Asia	www.nsasia.com
PureEdge Software	www.pureedge.com
Siebel Systems Inc.	www.siebel.com

Table 2: eForms Software Products

Company	URL	Main Product	Software Category
Adobe Systems, Inc.	www.adobe.com	Adobe Forms Designer / Acrobat	Forms Design / Printer
Amgraf, Inc.	www.amgraf.com	OneForm Designer Plus	Forms Design
Ansyrr Technologies	www.ansyrr.com	Mobile Office	PDF Plug-in
Appligent, Inc.	www.appligent.com	FDF Merge	Integration
AnyDoc Software, Inc.	www.microsystemsonline.com	OCR for Forms	Interpretation
Captiva Corp.	www.captivacorp.com	FormWare	Forms Processing
Cardiff Software	www.cardiff.com	Liquid Forms	Forms Automation
Cerenade (Formerly MMA)	www.cerenade.com	Visual eForms	Forms Design
Commerce Corp.	http://www.commence.com/pressrel/aformsprlaunch.asp	Allure Forms	Forms Automation
Create!Form	www.createform.com	Create!Form	Output formatting & delivery solutions
Ebase Technology	www.ebasetech.com	Redwood, Universal Form Server	Server
Evincible	www.evincible.com	Secure Form Solution	Secure Forms
FileNet Corp (Formerly Shana)	www.filenet.com	FileNet Forms Manager	Forms Design (Formerly Informed)
Formatta Corp.	www.formatta.com	Formatta Suite	Designer, Filler, Server
Formdocs.com	www.formdocs.com	Smart Forms	Forms Automation
Forms Automations Systems Technologies, Inc.	www.formsautomation.com	FormFast	Forms Automation
FormSite	www.formsite.com	HTML Form Builder	Forms Design
FormSoft Group	www.formsoftgroup.com	FormFinder	Forms Portal
Impact Systems, Inc.	www.impactinfosys.com	e-FormsIntegrator	Integration
Internet Commerce Express, Inc.	www.icomxpress.com	Lexign	Workflow Solution
Microsoft Corp.	www.microsoft.com	InfoPath	Integration
NetDelivery Corp	www.netdelivery.com	eForms Module	Targeted Application
Open Text Corp	www.opentext.com	Livelink	Integration
Primary Software	www.primarysoftware.com	VisiForm Designer	Forms Design
PureEdge Software	www.pureedge.com	PureEdge	XML eForms / Business Process Automation
ScanSoft (Formerly Caere)	www.scansoft.com	OmniForm	Forms Design
Texcel Systems	www.texcel.com	Form Bridge	Translation
Trillium Software, Inc.	www.trillium.com	(various)	Communications

Table 3: eCommerce Vendors

Company	URL
Httprint, Inc.	www.httprint.com
iPrint, Inc.	www.iptint.com
Media Flex	www.mediaflex.com
Noosh, Inc	www.noosh.com
Pace Systems Group	www.pace2020.com
Parsec Corp.	www.parsecorp.com
PIP Printing	www.pipprinting.com
Printable Technologies	www.printable.com
Print Café	www.printcafe.com
Printers Software, Inc.	www.printerssoftware.com
Prism-USA	www.prism-world.com
PROFIT Control Systems	www.profitcontrol.com
Printstream	www.printstream.com
Sir Speedy	www.sirspeedy.com
TripleArc Ltd.	http://www.triplearc.com/