The Seybold Report^{SM}

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SINCE THE MID-1990S, IT HAS BECOME INCREASINGLY CLEAR THAT information stored digitally is unnervingly fragile. The very technologies that enabled the rapid dissemination of news are conspiring to create a generation-size gap in the historic record. Lacking the appropriate systems, workflows and metadata to ensure longevity, news archives are setting the stage for future data loss.

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Kodak To Buy Creo *2*

CREO ANNOUNCED EASTMAN KODAK would purchase all issued and outstanding shares of Creo for $16.50 per share, or approximately $980 million. Shareholders who had recommended a change in Creo's management, supported the purchase.

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The Latest Word

After Acquiring ABDick, Presstek Restructures *5*

ALTHOUGH MANY PIECES ARE YET TO BE PUT IN PLACE, THE BASIC outline of the new Presstek group of companies is coming into focus. Presstek CEO Ed Marino said that the first priority at ABDick, which filed for bankruptcy last July, was to make the company healthy again.

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Kodak To Buy Creo for $980 Million

BY MOLLY JOSS

On Jan. 31, Creo announced that Eastman Kodak Company had agreed to purchase all of the issued and outstanding shares of Creo at a cash price of $16.50 per share, or approximately $980 million.

Later that day, Goodwood Inc. and Burton Capital Management LLC, the two companies that had recommended a change in Creo's board and management, announced that they support the purchase. "Based on this new development, the dissidents have chosen not to pursue their pending proxy solicitation in connection with Creo's upcoming and special meeting," said Robert G. Burton, chairman of Burton Capital Management.

Those words bring down the curtain on one of the most talked about and interesting corporate dances to take place in the graphic arts industry in decades. The tableau came to life in November, when Creo's board of directors announced that the upcoming meeting would be an "annual and special meeting." As has been the case with past annual meetings, this one was scheduled to take place in February at a hotel in Vancouver. What would have made this annual meeting extraordinary is that a corporate coup led by a determined group of minority shareholders was in the offing.

In light of Kodak's offer, Creo also announced that the shareholders meeting will now take place on March 29. Postponing the meeting will allow Creo to inform shareholders of all the pertinent details regarding the proposed purchase, according to the press release.

Disgruntled Dissenters
If the vote at the February meeting had gone their way, the dissenters would have demanded that Creo's entire 10-person board of directors step down immediately. Ten people selected by a group of minority shareholders (around 6%) known as "the dissenters" would have taken their seats and proceeded to make significant changes in how the company was managed.

One of the leading dissenters is Peter Puccetti, founder and investment manager of the Goodwood Fund and the Goodwood Capital Fund, two Canadian hedge funds. Speaking before the purchase was announced, Puccetti was up-front about why these shareholders banded together to seek wholesale change in Creo's board: "Our beef is that the company has not been run for the benefit of the shareholders," he said.

After the announcement, Puccetti said Kodak's bid of $16.50 a share was just enough to make the dissenters agree to the purchase. They had hoped for something in the range of $16 to $25 a share, and had thought $18 a share was realistic. Puccetti was nonetheless pleased with the outcome and felt that the dissenters had played a pivotal role by creating a powerful impetus for a sale. "We're the reason this happened," he said.

It's not difficult to see why Puccetti and other dissident shareholders were disgruntled; the company's net financial performance during the almost six years it has been publicly traded has been uneven at best and dismal at worst. After reaching a high of $52 dollars a share on March 10, 2000, the stock price had fallen sharply. The lowest point for the stock came in October 2002, when the stock sank to $4.30 a share. The stock price rose slightly last fall when news of the dissident group's intentions reached the market and again later in the fall when rumors surfaced of a possible sale of the company. On Jan. 25, shares were trading at around $15. On Jan. 31, news of the sale caused a jump in trading and the stock closed out the day with a

high of $16.40. Kodak closed that same day at $33.09.

Moreover, Creo's net profitability decreased substantially over the past few years. Although revenues rose dramatically over the past 10 years, net income and net profits shrank. Meanwhile, the company's employee roster has increased by several thousand. For fiscal year 2004, the company reported about $12 million of net income from revenues of nearly $700 million, a net profit margin of less than 2%.

The company's performance compared with that of other major prepress and printing industry vendors sheds additional insight into why some shareholders lobbied for significant changes. According to data collected by Hoover's Online, Creo's gross margin is twice that of the industry average of companies categorized

Creo Stock Performance

High: $52.00
Mar. 10, 2000

Low: $4.30
Oct. 7, 2002

as "diversified machinery" companies, but its net profit margin is just one-third of the net profit margin of industry averages and its return on equity one-fifth of industry averages.

On Jan. 20, the company announced that its preliminary reckoning of first quarter financial performance revealed better than expected results. In a press release, Creo stated, "The company now expects total revenue in the range of $175 million, representing the highest quarterly revenue in the company's history."

Newcrest analyst Scott Penner was not impressed with the preliminary results. Quoted in the Dow Jones Market Talk report the day after Creo announced preliminary results, he remarked that perhaps "some business has been pulled forward to

achieve the 1Q upside." Orion Securities' David Hodgson pronounced Creo's press release "timely" and went on to say, "Perhaps if Creo could have delivered these types of positive surprises more often, the company would not find itself in its current predicament."

The Dissidents' Strategy

The dissenters' 52-page call-to-change document, issued in early January (available at http://www.creodissenters.com), wasted no time getting to the heart of its position on what's wrong with the company and why changes must be made. The first paragraph of the document reads: "Creo Inc. is a company with lots of potential. In the 1990s, Creo made a name for itself as the company that led the commercialization of computer-to-plate (CTP) devices for the commercial printing industry. As a result, Creo has the largest installed base of CTP devices in the world. Despite this, the current board of directors of Creo and current Creo management have made decisions that have resulted in sub-par operating performance, missed targets and poor capital allocation, all of which have destroyed shareholder value."

The remedy, said the dissidents, would be a change in direction, the exact nature of which was spelled out in detail in the rest of the document. One of the first things that would change, Puccetti said in mid-January, is who would run the company on a day-to-day basis. "One of the first acts of the new board would be to replace Michelson with Robert Burton. Burton is the key. He has the talent to run any business that has products and customers," Puccetti said.

Robert Burton, one of the other key dissenters, is CEO and managing member of Burton Capital Management, an investment firm he founded in January 2004. Burton was previously chairman, president and CEO for two years of Moore Corp., a multibillion dollar printing company. Burton has headed other major printing firms,

including World Press, which he led into a merger with Quebecor Printing in 1999.

With Burton at the helm, the dissenters planned to streamline the business, reduce costs and increase revenue. Plus, the group promised to revamp Creo's digital media strategy to reduce the company's capital investment in this part of the business. In the process, underperforming and non-core products and product lines would be shut down, sold or spun off. They proposed reducing costs by several means, including trimming R&D spending, and consolidating corporate functions. The increase in revenue would come about, in part, by decreasing expenses, but also by increasing sales efforts and through strategic acquisitions.

Status Quo Seekers

The current directors denounced the dissidents' plans as "ill-conceived" and "high-risk." Although the directors have agreed to an independent review of the company's recent business strategy and practice, they said that the changes suggested by Puccetti, Burton and others would impede the company's growth and take it in the wrong direction.

Before the sale, Richard Dunklee, a board member and president of the Creo Users Association (https://ecentral.creo.com/cua), explained that the users group was siding with Michelson and the current management team because the users don't feel that a change is in their best interests right now. "Burton and his group would be inclined to reduce costs to increase profits and shareholder value," Dunklee said. The changes they proposed, Dunklee suspected, would reduce the level of support that users enjoy currently.

He also had doubts about a strategy that reduced the amount of money invested in R&D efforts. "Reducing R&D or consolidating product lines is not a good idea. We feel the current team does a good job of balancing R&D and support for users," Dunklee said. "Burton's strategy is a quick death to the company. … If service and support start going down, we'd look elsewhere," he said.

Commenting on the news of the sale of the company to Kodak, Dunklee said that his biggest concern is whether the current level of services and support will continue. "It's the same concern I had with the Burton group," he said. "Kodak doesn't have

a good track record when it comes to support. It has tended to outsource support."

Dueling Analysts

Prior to the sale, some industry analysts felt the current overall strategy and management team should remain intact while others said a considerable change is long overdue. One analyst, who requested anonymity, said the situation reminds him of Iraq: "You can win the war but not the peace." His hypothesis was if Kodak had not intervened that after the February board meeting, the stock price would have "dropped like a stone." If Burton wins, he said, it wouldn't take him long to alter the company and possibly position it for sale. If Michelson wins, things go on as they have and that situation is not viable long-term. Besides, he suggested, the losing side would sell its shares no matter what happened on Feb. 10.

The analyst was also concerned about the current senior management's faith in the viability of the company. He pointed out, as do the dissidents in their manifesto, that senior managers, including Creo Americas President Judi Hess and Corporate VP, business strategy David Brown, have sold large blocks of their Creo stock over the past few weeks and months.

On the other hand, Brian Piccioni, an analyst with BMO Nesbitt Burns, said that although Creo has made some errors in the past, the changes proposed by the dissidents would harm the company. Specifically, he posited that the reductions in R&D would trigger a massive exodus of the company's key R&D staff. "Changes may be necessary, but they must be done skillfully and with due consideration of various R&D projects," said Piccioni. He said Michelson and the rest of the current management are capable of making any necessary changes, and "R&D would be the last to be affected."

After the announcement of the deal, John Zarwan, founder of J. Zarwan Partners, an industry consulting firm that specializes in business development and change management, said that the deal was understandable in some respects, but was still unsure of the effects of taking on such a heavy debt load would have on Kodak. He talked about a conversation he'd had with a financial analyst soon after the news was made public in which the analyst had said: "My bet is that within two years Eastman Kodak will be forced to write off $500 million under the new accounting rules on goodwill. They effectively admitted that the acquisition was not accretive in the first year, at a minimum. And then we have the severances, etc. It will be expensive."

What Happens Next

The deal isn't done by any means. While the dissenters have withdrawn their proxy vote, the majority of shareholders must agree that the deal is worthwhile. Much depends on the case Creo is able to make by the March meeting. Later this week the company will file a brief that could detail some of the proposed changes in the company if the sale takes place.

In the Jan. 31 conference call, Michelson refused to speculate on possible management changes if the sale is completed. He did say that he expects Kodak to operate Creo as an independent division. He and Spencer also refused to comment on what changes might be made to the operation in general or to specific segments of the company's operation.

Although Michelson and Spencer both said that they don't expect any regulatory hurdles or anti-trust flags to be raised by the prospect of a sale to Kodak, several governments, including the United States and some European countries, must approve the deal. If all goes well, the approval process will take three to five months after the deal is approved by the shareholders.

The Last Analysis, For Now

Puccetti, Burton and friends are probably going to treat themselves to a nice meal some day soon and maybe another one after the March shareholders meeting. No matter what eventually happened in their shareholder revolt, they were in a strong position to improve the stock price of the company.

Their dissent with Creo management might have nudged the sales process along because Kodak might have been concerned that the dissenters could win control of the company in early February. Their takeover could have caused the stock to go up and Burton might have been successful in either making the company more profitable or selling off assets. Waiting to see whether the dissenters would win might have made it more costly for Kodak to purchase the company later on. Given Kodak's stated desire to grow through acquisitions during the next few years, sooner rather than later seems a more sensible strategy for Kodak.

The impact of the acquisition will be felt by other companies as well. Since Presstek is both a competitor of and partner with Kodak and KPG, and Creo and Presstek both manufacture digital plates, the acquisitions of both KPG and Creo by Eastman Kodak will certainly stir things up for Presstek.

Presstek CEO Ed Marino sees both Kodak acquisitions as good for the industry. "This industry was in need of some excitement," he said. "I'm not losing any sleep over this. KPG knew we were both competitors and potential partners when we discussed the KPG DI press. They know how to work with partners, and I think the partnering will only continue to grow. We are in discussions with KPG about some of the ABDick channels right now. We see opportunities to help accelerate placements of the KPG presses. You can be sure we are not going to abandon valuable partnerships."

Kodak is not a company that makes acquisitions on a whim, so it probably sketched out in advance its plans for what happens to Creo after the sale and is filling in the details on a daily basis. Making Creo more profitable as soon as possible is probably a high priority. In the end, the strategies the new management undertakes might not seem too different from those proposed by Burton. Some specifics and timetables might differ, but Kodak will not certainly not settle for owning a company that makes less than 2% profit a year. **TSR**

Stephen Beals contributed to this report.

After Acquiring ABDick, Presstek Restructures

BY STEPHEN BEALS

On Jan. 24, Presstek made several simultaneous announcements regarding a substantial restructuring at its newly acquired ABDick subsidiary, as well as at Presstek itself.

- Susan McLaughlin was named the new president of ABDick and senior vice president of Presstek;
- Presstek Chief Financial Officer Moosa E. Moosa was promoted to executive vice president at Presstek;
- The appointment of McLaughlin will bring Michael McCarthy, who has been in Chicago overseeing the transition process, back to New Hampshire, where he will continue to head the Presstek component of the realignment.

The changes were brought about by Presstek's acquisitions of Precision Lithograining Company (PLC) in July 2004 and ABDick in November, for $13 million and $44 million, respectively. In addition to expanding Presstek's manufacturing, sales and distribution in the U.S., the ABDick acquisition included ABDickUK, which Presstek CEO Ed Marino pointed out was already the largest European distributor of Presstek products. Presstek also has a Presstek Europe Division headed by Quen Baum. Ray Hillhouse will continue to run ABDickUK.

Although many pieces are yet to be put in place, the basic outline of the new Presstek group of companies is coming into focus, based on the teleconference, press releases and interviews with McLaughlin and Marketing Director Bill Davison, a key member of the transition team. Marino said in a telephone conference call that McLaughlin's first priority at ABDick, which filed for bankruptcy last July, was to make the company healthy.

Presstek Then and Now

Perhaps the most telling way to describe the changes at Presstek is to compare the old Presstek with the new one. In 2004, the company had about 3,000 total users of Presstek products. With the addition of ABDick's 13,000-15,000 customers and 1,000 PLC customers, Presstek will now service more than 17,000 customers. The 75,000 square feet of manufacturing space Presstek owned then could produce 12 million square feet of consumable products and some 400 pieces of digital equipment. With the new resources, the company has 200,000 square feet of manufacturing space capable of producing 90 million square feet of consumable materials and 800 equipment units.

Marino said Presstek anticipates that the two companies will be fully integrated by next July, and Moosa said the Presstek will save about $7 million from the consolidation and streamlining effort. About 100 employees did not survive the transition, and their departure saved the company about $5 million.

One major change is that all of ABDick's manufacturing and engineering functions will be assumed by Presstek directly and will no longer fall under the restructured ABDick. The ABDick manufacturing operation in Rochester, N.Y., employs about 50 workers. McLaughlin said the company will retain a "substantial presence" at the Rochester facility, although specific numbers have not been determined. The total ABDick operations staff after the acquisition was about 700 employees. Without being specific, McLaughlin said staff will almost certainly be reduced.

Setting a Fast Pace

McLaughlin said the leadership team will quickly identify its priorities and make them clear throughout the organization. "There will be very specific objectives related to those priorities," said McLaughlin. "We will get Ed and Moosa's blessing, and then we will move forward to execute. We'll make sure we are exquisitely focused on those few things that are really going to get us where we need to go with the right objective," she said.

McLaughlin has a history of turning around companies. "I have spent my career in operations that require a turnaround or at least a jump-start," she said. "I had eight jobs in my 10 years at Kodak and all with organizations that needed to be taken to a new level," she said. "I believe that speed is a real virtue. I'm very data-oriented, and we will move quickly to make decisions. We will correct where we need to change direction, but we will move with great speed and decisiveness," she said.

Digital Transition

Davison, a member of the transition team, addressed how Presstek hopes to move the small commercial printers that are at the core of ABDick's customer base into the digital arena. "The small commercial and in-plant printers are in a very volatile marketplace," said Davison. "Our analysis says that relatively little of that portion of the marketplace has made the digital transition. Our products and technology are

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Key People
Edward J. Marino: President, CEO, and Director
Moosa E. Moosa: EVP and CFO

Stock Performance
Last Close: $8.39 (Feb. 1, 2005)
52-Week High: $12.20
52-Week Low: $8.15
Basic EP: $0.24
Price/Earnings Ratio: 34.96
Current Ratio: 2.63

Presstek combines state-of-the-art printing-press and computer technologies in its PEARL direct imaging (DI) systems. These systems produce color printing plates and non-photosensitive films and also transfer images from computer to press. The PEARL process results in high-resolution plates without chemical processing or hazardous byproducts. Presstek markets its products through 32 graphic arts dealers worldwide; customers include the printing and graphic arts industries. Presstek's Lasertel subsidiary provides laser diodes crucial to the manufacture of the company's DI systems.

very well suited to that marketplace, and ABDick has the relationships and the service network and a very large installed base of DPM solutions," he said.

Supporting those smaller customers is integral to the strategy, Davison said. "The end user cannot afford to simply buy digital solutions," said Davison. "They are going to need support in doing this. Part of the change at Presstek over the last couple

oper on a low-cost, high-efficiency workflow that Presstek and the developer plan to make as simple to use as possible. "We can't penetrate the low-end market with $20,000-25,000 digital front ends. This will come in at a much lower price point," Marino said.

Marino also said Presstek is working on a 4-up version of the Vector platesetter the company designed for ABDick last year

We're trying to get away from the historical industry tendency to push boxes.

of years is that we are now very customer focused and are instilling this same sensibility in ABDick."

Davison said the company plans to deliver products that are a balance of equipment, supplies and value-added services, including training, to help small printers. "We're trying to get away from the historical industry tendency to push boxes," he said. "The small customer has trouble maintaining and attracting skill sets. They have limited resources financially, so we need to provide products that are easy to use, operate and maintain," he said.

Marino said Presstek has been working closely with an unnamed third-party devel-

using Presstek laser technology. The 2-up version of the device was delayed during the bankruptcy and merger proceedings, but Marino said it is now back on track and beta versions should be showing up at sites in the next few weeks.

Presstek issued a vote of confidence in Marino and Moosa, who both signed new three-year employment agreements with the company in early February, extending their employment through 2008.

Our Take

Despite the bankruptcy, ABDick has a solid customer base and a strong reputation. Its sales and service staff continue to

be well respected. In addition, most observers agree that McLaughlin is one of the best makeover artists in the business. Presstek itself could serve as a model for the restructuring. Under Ed Marino, the company has successfully pared down its structure over the past two years to become a company that not only delivers leading-edge technology, but profits, too.

Presstek is gambling that small printers will make the transition (and relatively soon) into digital print production. It seems like a pretty safe bet. What remains to be seen is how comfortable the relatively low-tech small printers that form ABDick's customer base will be with the new face of Presstek. Presstek has been gently persuasive in easing the minds of the bankrupt company's suppliers and creditors, and most, if not all, are on board.

There will need to be new partnerships over time and Presstek would do well to be patient. The company said it is committed to providing educational and training solutions as part of any future equipment packages, and that's a good sign. It may be most important to see how Presstek does at developing unique market-based, customer focused and easily implemented solutions for ABDick's customers. Adding value to carefully thought-out products will be the key to success for the new ABDick. **TSR**

Following the Trail of the Disappearing Data

By Victoria McCargar

Since the mid-1990s, it has become increasingly clear that information stored digitally — unlike physical photos, for example — is unnervingly fragile. Lacking the appropriate systems, workflows and metadata to ensure longevity, news archives are setting the stage for future data loss.

Sitting on my desk is a black-and-white aerial photograph looking up Pasadena's Arroyo Seco at the Rose Bowl on a sparkling winter day. The picture is in very good condition, the emulsion intact, with a couple of minor wrinkles and a mark or two from an orange grease pencil. I can see on the back the carefully applied caption from the day it ran in the *Los Angeles Times*, Jan. 1, 1935 (Alabama beat Stanford, 29-13). This picture looks like it's good to go for at least another 70 years.

On the monitor of my Macintosh G4, I have a JPEG from Mullaittivu, Sri Lanka, from Jan. 1, 2005. It's an arresting image of the forearm and hand of a dead woman, visual evidence of the human tragedy of the Dec. 26, 2004, tsunami. Someone in 2075 (amid global warming-induced flooding, perhaps) might want to see exactly what Mullaittivu looked like on this day. Will he or she be able to pull up this 200-dpi, 584KB nugget of disaster history 70 years from now?

Don't bet on it just yet.

Since the mid-1990s, it has become increasingly clear that information stored digitally is terribly fragile. Newspapers periodically run stories about this phenomenon and give good coverage to heroic data rescue efforts, such as the British project to salvage the Digital Domesday Book, or conundrums, like the difficulties museums are having curating digital works of art. But there appears to be a mysterious disconnect when it comes to another group with an important cultural stake in long-term preservation: newspaper archives.

Research on a global scale is under way to find solutions to preserving born-digital content, but it's a field limited almost exclusively to academic and research libraries, national archives and bureaucratic record keepers — professionals invested with a defined responsibility to keep digital files alive and accessible for a long time.

So it is ironic that even as they're publishing stories about data fragility, newspapers haven't quite made the connection with what is going on in their own electronic morgues. (I refer throughout to newspaper archives, but in fact the same issues affect other news media collections as well — for that matter, any data collection that is supposed to last indefinitely.)

The fact is, photo and multimedia databases, and even text databases are potentially shorter-lived than yellowing newsprint, and some formats in use today will ultimately prove more unstable than chemical color photography. Indeed, the very technologies that have enabled the rapid dissemination of news are conspiring to create a generation-size gap in the historic record.

Only 1s and 0s

Digital data is basically a collection of on-off switches, strings of 1s and 0s (bits) ordered in manageable chunks called bytes. In simplest terms, what differentiates the million bytes of a 1MB JPEG from the million bytes of a 1MB spreadsheet is how the bytes are interpreted by which application. But other factors besides software determine the future accessibility and readability of the 1s and 0s: platform and operating system, storage structure, technical metadata, content description, copyright and even (maybe especially) institutional discipline. Over time, sometimes catastrophically quickly but more likely gradually, a byte stream will tend to become unreadable, essentially reverting to the magnetic on-off switches of storage media, the 1s and 0s.

The task of identifying all the risk factors and putting preservation solutions in place has barely begun. In the meantime, lacking the appropriate systems, workflows and metadata to ensure longevity, news archives are setting the stage for future data loss. It's not too much of a stretch to say that byte streams that have been stored for the past 10 years — and those that will be captured and stored tonight or next week — might already be lost.

It's not hard to see how this happened.

Lured by speed, unprecedented accessibility and flexibility, not to mention gains in staff productivity, publishers and their newsrooms have embraced technologies that enable a wealth of functions: easily captured, edited and transmitted photography, full-page pagination, Web publishing, content sharing and repurposing, and PDF workflows, to name the big ones.

Over in the news library, meanwhile, huge gains in storage density and processing power meant that big, increasingly sophisticated image databases or burgeoning collections of images on CD-ROMs have relegated black-and-white prints in envelopes to the back of the stacks. "Archives" have morphed into "assets," and assets have come to refer to a variety of formats beyond photography and text. Information graphics, analytical databases, HTML pages and digital video all have all become part of the potential multimedia archival mix.

As technology has come to play a larger role in the news archives, responsibility for maintaining content has in many cases been transferred from traditional archivists and librarians to systems analysts. At the same time, the automatic capture of bibliographic and descriptive metadata from the publishing system has resulted, not surprisingly, in heavily downsized archives and library staffs. This is a major shift in information management philosophy, because IT departments arguably have a different approach than libraries to long-term preservation.

Budgeting for Preservation

Archives consisting of envelopes of old clippings and black-and-white photographs didn't require large capital outlays every few years to sustain them; as long as they were protected from dangers such as fire and water, and kept in a reasonably controlled environment, they could survive almost indefinitely.

Digital data is very different, primarily because it doesn't respond well to that kind of benign neglect. To forget about a few envelopes of CD-ROMs in a file drawer for 10 or 15 years is asking to lose them; to skip a couple of upgrades is to put an entire format at risk.

The problem with funding archives, moreover, is that it's difficult for budgeters to see a return on investment. While digital preservation costs are still mostly a matter of speculation, most researchers agree that it will be expensive. True, some news archives generate a

Even with well-executed batch migration, over time errors are cumulative and data gradually becomes unreadable.

modest revenue stream from reselling old images and articles in new digital forms, but beyond that, publishers and chief financial officers aren't necessarily willing to spend money to meet some vaguely perceived obligation to maintain a record of history in the making.

Surviving Space and Time

Digital archives exist in a physical world and are subject to equipment failures, such as burst pipes and the like. Properly backed up, the data will survive physical dangers and be restored. But digital preservation does not equate with disaster recovery — a misconception that IT professionals often have. The threats I'm concerned with here are much more subtle, amounting to the gradual loss of information through a variety of changes over time.

Software obsolescence. This is such a seemingly ordinary problem that it's tempting to think that it really isn't one at all. If systems administrators are careful enough to make every upgrade on schedule, the objects will migrate naturally to the next version, or so the thinking goes. But batch migration of thousands or millions of individual objects from one version to the next is not common practice. The typical workflow is to leave an object in its original version until a user needs it for some new purpose.

But what if a user retrieves the object created in version N, and the only available software in-house is version N+5? Backward compatibility will never be unlimited, and the nature of forward migration is to introduce errors with every upgrade, however minute or undetectable. Even with well-executed batch migration, over time those errors are cumulative and the data gradually becomes unreadable (see illustration).

That assumes the software continues to exist and function. WordStar, a nearly ubiquitous word processor in the 1970s and 1980s, is often held up as the poster child for digital obsolescence. No current word processing programs will open a WordStar file, and the

company stopped manufacturing the software in 1991. Cracking old WordStar files now amounts to a hobby for computer enthusiasts.

Hardware obsolescence. Every new data storage format signals the end of its predecessors, be they Zip disks putting an end to 3.5-inch floppies or EVDs (enhanced versatile disks) putting users on notice that there's a format beyond DVD. While it's true that few people do any serious archiving on Zips (or their successor, memory sticks), many news archives have consigned their photography to CD-ROMs, and they're now looking at having to shift to DVDs. Inasmuch as CDs are turning out to be subject to more physical deterioration sooner than thought, having to reformat on the more stable DVD platform is probably a good thing. But it's still a moving target.

If photographs are stored in large databases with industrial-strength hard disks and tape-drive backups, the material is easier to move forward than collections of disks.

Inadequate metadata. In a January 1995 *Scientific American* article, RAND Corp. researcher Jeffrey Rothenberg pointed out that if modern civilization is going to hang onto digital information into the future, its denizens are going to have to create a lot of other information about the information to go with it, to enable future seekers to write new software to "bootstrap" their way into rendering the obsolete data into some form that humans can read. That information about the information, or metadata, is critical to the preservation process — probably a great deal more important than software or hardware, in fact. Much of the research agenda in data preservation focuses on what that metadata should comprise.

In his article, Rothenberg proposed that the information include, minimally, specifications about hardware, operating system and software requirements; byte-stream interpretation, and enough information about the software code itself to allow a future user crack it — essentially a digital Rosetta Stone.

That so-called technical metadata is in addition to the more familiar content and context metadata: the journalistic who, what, where, when, and why of good caption-writing; bibliographic data such as date of publication, section, edition, part and page; and enough information about the copyright status of the object to ensure that future users know what their access rights are.

Some of this metadata can be captured or generated automatically, but a lot of it cannot, and producing it will not be inexpensive. Assigning index terms according to a controlled vocabulary, sometimes known as keywording or taxonomy, is a good example of this. As much art as science, good indexing provides ways to limit searches and zero in on the subject of an article or image, saving the user from looking at a lot of irrelevant material.

As multimedia databases grow and become more complex, smart metadata will make the difference between a useable database and one that merely contains objects. If an object can't be searched for, found, retrieved and used, it is as good as lost. As brilliant as Google is, simple free-text searching isn't up to the kind of sophisticated searching that news users need. No one will want to slog through a Google-scaled 10,000 or 20,000 hits in his or her own multimedia database.

And just because an object is never retrieved doesn't mean it doesn't still reside in the database. Over time, systems analysts and budget writers will find themselves supporting — and financing — a larger and larger chunk of this "dark" data.

Lack of standards and best practices. Preservation researchers agree that tight standards are key to solving the data longevity problem. The academic and research library and archives worlds, which have been grappling with the digital preservation problem for most of a decade, are coming at it from a foundation of fairly rigid standards for digital data structures and description, beginning with MARC (machine-aided cataloging) in the 1960s, and proceeding through today's emerging standards like MIX (technical metadata for still images in XML) and METS (metadata encoding and transmission standard). They are, consequently, well prepared to begin adding preservation metadata to their institutional workflows as standards begin to take final shape in the next few years.

News archives practice has developed in response to the deadline demands of news research and, more recently, the requirements of repurposing material for the Web and other products, including sharing content with sibling properties. One-off systems and local customization are gradually giving way to discussions of ways to interoperate, developing best-practices workflows not just within a single news organization, but within a corporate chain. The venerable IPTC (International Press Telecommunications) "header" is a logical place to start talking about standards for preservation, but eventual solutions will come at the expense of flexibility and the latitude to customize.

Lack of institutional discipline. Customization has usually been born of necessity. Meeting production deadlines and the "get the paper out at any cost" mentality that is the hallmark of working in a newsroom tend to produce some really creative workflows. However, in the automated capture and processing of metadata, spot innovations and one-off workarounds can play havoc with the digital record.

Best practices for digital archiving suggest that the process actually begins with the photographer or reporter and continues through the entire editing process. But the burdens and requirements of well-

How the Government Saves Its Assets

How do you build a system for long-term preservation? Even though many of the potential tools and processes are still theoretical, there is an immediate need for systems that will retain data for long periods. Currently, the public sector is leading the charge.

TranTech Inc. is a U.S. government contractor that works with federal agencies and technology companies to build systems that meet federal standards for data preservation, among other requirements. THE SEYBOLD REPORT interviewed Mark Wells, TranTech's technology director, by phone from the company's headquarters in Alexandria, Va.

THE SEYBOLD REPORT: *Talk about TranTech and its role in digital preservation.*
Mark Wells: Our concentration is mainly in software development, database development and digital media for government agencies. When it comes to preservation, the government has its own set of requirements that our clients have to follow, especially Department of Defense (DoD) directive 5015.2 ("Design Criteria Standard for Electronic Records Management Software Applications," 2002), which says how any record management application must be built. What DoD establishes, everyone follows. Also, the U.S. National Archives has Title 36 from the Code of Federal Regulations, which tells you how to maintain historically important records and documents. There's a whole series of other regulations we deal with.

TSR: *What are the typical issues you confront when you are required to create a preservation-oriented system?*
MW: The good news is, when you do business with the government, the regulations are laid out for you: "Here they are, you will abide by them." That makes it a lot easier, because you don't have to discuss what the rules and regulations are in regard to accessioning and disposition: what you take in and what you discard. They tell you at any point in the lifecycle of a document what can be done with it. Regulations spell out what an important document is, how long to maintain it, what you do based on document type: Is it operational information, classified data or something that is historically beneficial to the public? Those considerations tend to drive how long you have to keep things — some for one year, some for three, some for seven, some for 25, *ad nauseam*. If you don't abide by the rules, you could go to jail. So having a policy is important.

[Systems developers] don't always talk to the right people. Have you talked to the archivists or record management people at the agencies, the people who are really knowledgeable? Does everyone talk to them when they're implementing a system? No. Do people build systems without talking to the right people? Absolutely.

The DoD model has built-in checks and balances, so if the system isn't right, you'll find out. Yes, you may build a system that doesn't necessarily comply with the requirements. But before you go online with it, it goes through a series of checks, and if it's wrong, you'll hear: "Wait a minute. You didn't comply. You'll have to go back to the beginning."

TSR: *Are more companies starting to develop preservation-compliant systems?*
MW: Vendors are definitely getting up to speed; it's more and more part of the IT world. The federal government has made a strategic move away from what's called GOTS (government off-the-shelf software) — one-off systems, which are hard to support — to COTS (commercial off-the-shelf software).

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formed metadata are way beyond what can reasonably be expected of shooters, wordsmiths and artists. On the archives end, the only way to guarantee the compliance of the record is a set of quality controls, which are usually humans drawing a salary and benefits. Without them, the resulting record is basically an anomaly and, over time, subject to becoming invisible to a future search engine.

Moreover, any current and future efforts to develop digital preservation solutions will be aimed at solving a standardized problem — developing a uniform migration path for JPEGs to a future format like JPEG2000, for example. If an individual news archive isn't IPTC-compliant, is using a slightly different version of JPEG or has incomplete technical metadata because of one of a dozen possible user workarounds, the standard "rescue" solution might pass it by.

XML is frequently mentioned as a preservation solution because of its platform independence and highly intuitive, self-describing tag-sets. XML in theory and XML in practical application are quite different, however, and the rigid workflows required for well-formed XML are hard to come by in most newsrooms, especially at the design desks, where a lot of last-minute changes take place. When deadline performance is at stake, the creative workaround will trump the compliant workflow every time.

Copyright. It's not a technological problem, but it's almost as big a threat as obsolescence and could turn out to be even harder to solve. In the fallout from the Supreme Court's 2001 *Tasini v. New York Times* decision over the rights of freelancers, large parts of news archives disappeared from their host databases, either moved offline or deleted outright. As digital copyright continues to evolve, archive managers are struggling with how to handle freelance material, for which in many cases archiving is *verboten*.

We're working more and more with commercial vendors. We say to them, "Here's what we have to do, here's the method to get compliance, here's what government needs." If you're a commercial vendor, for your software to be declared a "System of Record," it has to be tested to fulfill DoD 5015 compliance.

Government is good at driving standards. It likes to produce them and it has been doing it for a long time; 5015 got its start back in the 1970s. As the established policy becomes more and more accepted, other parts of government start using it. So even though 5015 started at the DoD, it is now a government-wide standard. Vendors like Documentum, Interwoven and other builders of document management systems have gone to the trouble of making their software compliant, because they want to do business with government. Commercial enterprises will start to get the benefit.

Mark Wells

TSR: *What's your advice to a company seeking to undertake long-term digital preservation?*
MW: Commercial organizations have requirements, too — laws applying to financial management, like Sarbanes-Oxley. There are also state and local requirements for asset management, which drive preservation and records-management rules. First and foremost, you need to know what laws and regulations affect what you do. Once you figure out what those are, look at your document lifecycle and ask yourself what you might start doing differently.

The big thing I say to people is, "You have to decide between preserving everything and preserving some." There are two entrenched sides to this, and the problem is, you end up with a zealous war between two factions. You need to work at finding common ground.

You also need to identify what's best practice for what you do. Here again, there are battles between two extreme groups: those who want to keep the exact original and those who don't think it's necessary. I tell people to concentrate on the "essence" of what they're preserving, to do what I call an essence study. Can I change an object from format to format to format?

Take videotape. Video-to-digital can easily transfer the essence to DVD without any real loss. Paper photos can be digitized without much loss of essence. The digitized picture is the same thing, you get the same reaction to it, it has the same bits of detail.

However, there are other issues. For example, for the National Archives, a screen capture of the Declaration of Independence doesn't necessarily capture its essence. There's much more to it than the "data." There's historical value there, which is lost if you transfer to digital. But the preservation of essence can be an enormously expensive undertaking. How far are you willing to go?

TSR: *Overall, how expensive is this going to be?*
MW: The argument is still out on cost models for preservation. Because of the factions involved, decisions are complicated. One faction can show that there's no cost to keeping digital objects. But for the faction that is so involved in preserving originality, like cultural heritage institutions, the cost can be very high.

It also comes down to the costs associated with the legal ramifications of preservation. But even those are hard to track, because government requirements can change on a whim. The Patriot Act and Sarbanes-Oxley are examples. Information that used to be thrown away now has to be maintained. We're talking about billions of dollars to change systems just because of the way a law is written. Sometimes a single word can have astronomical impact on cost. In the Patriot Act, changing an "a" to "the" cost billions of dollars. **TSR**

— By Victoria McCargar

What can a newspaper or magazine do with freelance stories and photos to archive its own published record? The answer, surprisingly, is to microfilm it with the rest of the paper.

The electronic version, on the other hand, may exist in a digital limbo, moved to the archive in an automated workflow, invisible to users, its status uncertain. And creating metadata for copyright that will be meaningful 50 or 100 years from now seems to require a rather large crystal ball.

Coping Techniques

While preservation-oriented standards, practices, users and vendors sort themselves out, there are a few seat-of-the-pants techniques that work fairly well, as long as alert people in the organization stay on top of the content they're trying to keep. None, however, is more than a short-term, stop-gap method. At this point, that's simply all there is.

Migration on demand. Files are upgraded piecemeal as the need for one in the newer version arises. Unneeded files remain in the old version indefinitely. The migration process also necessitates accounting for the transfer of all the metadata, which might exist in a separate format, while retaining all its connections to the original object if the metadata is not contained, or "encapsulated," with the object. A thorough, well-documented testing program is essential before undertaking a larger-scale migration, and careful documentation is necessary for future users to understand the outcomes of successive migrations.

Technology preservation. This involves keeping one or more older computers running and maintaining the software versions that require older machines. Files that can't be migrated are stored here, too. This is actually a fairly good, inexpensive approach, as long as the machines are in working order or can be repaired if

Standards Are on the Way, But Will They Help?

When every upgrade promises bigger, better, faster features, the word "standards" tends to provoke fear and loathing among some technologists. Standards, almost by definition, suggest the lowest common denominator — hardly an environment to foster innovation and competition. Yet standardization in a number of areas, including workflow (otherwise known as "best practices"), formats and metadata, is held out as the overall solution to the long-term management and preservation of digital information.

There are standards, and then there are standards. We refer to PDFs and Word or Excel files as "standard" formats, and indeed they are, but they are *de facto* standards, meaning they are standards ("in fact") only as long as Adobe and Microsoft choose not to change them. For example, the increasingly full-featured PDF, which allows such bells and whistles as embedded scripts or moving images, is behind the ongoing effort to create a standard, "archival" PDF, called PDF/A. This simple format — relatively speaking, the digital equivalent of paper — is currently in the review and balloting process toward becoming a *de jure* ("by legal right") standard, one that is determined by an international standard-setting body and can't be changed without deliberation and a vote by the group. That sort of rigid standard will help determine the future sustainability of digital objects, because standard preservation solutions will fol-

low. There is much more risk where standards are absent or insufficient.

One area where standardization is undergoing close scrutiny is the development of metadata for preservation. For the past decade or so, institutions of all kinds, from newspapers to libraries, have rushed to digitize their collections. That has been followed by a similar rush to develop metadata suites designed to enhance search and retrieval, as well as long-term access. Over the past few years, attention has been zeroing in on what is called technical metadata: information about a digital object that would allow its contents to be retrieved and understood even if the original software and operating system are long gone. While researchers concur that capturing technical metadata is critically important, it remains an expensive, largely manual process. Moreover, there are so many domain-specific "standard" approaches to what constitutes technical metadata that it summons to mind the old joke, "The great thing about standards is there are so many of them."

There is one widely watched project to create a core metadata standard for long-term sustainability. Known as PREMIS, for Preservation Metadata Implementation Strategies, the project (under the auspices of the Research Libraries Group and Online Computer and Library Center of Dublin, Ohio, which brought us the

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damage occurs. It's not a viable solution beyond a few years, though. Similarly, the files might not be formally backed up anywhere, meaning a system crash is potentially the end of the data.

Normalization. This refers to saving the object in a single format that is easier to preserve. In practice, this can mean exporting files to flat ASCII or even printing everything out on paper (popular for e-mail). The development of the so-called "archival" PDF, known as PDF/A, is another example of this approach, one that aims to extend "normalization" to any system in any institution. Loss of functionality of the original document is an obvious drawback, and there are further issues of how to authenticate the "original" if that is a consideration. (For example, a PDF of a freelance contract, which is a legal document, will require a fairly sophisticated method of authenticating the signatures — yet another bit of software that will somehow have to travel with the document for the life of the contract and beyond.)

Bit-level preservation. This is a fancy term for hanging onto problem files but giving up on the ability to render them pending some future technological develop-

ment. The hope is that if the data can be preserved, someone will eventually figure out a way to render it. Interestingly, systems administrators might already be doing a fair amount of bit-level preservation without knowing it, depending on how many files they're accumulating in their databases that are obsolete, can't be opened, are no longer identifiable, or lack enough metadata to support search and retrieval. Whether that mass of dark data eventually is measured in terabytes or more is a function of how comprehensive the metadata is and how thoroughly the whole asset management process has been documented.

Hard Questions

News archives have a comparatively long track record in what is now termed digital asset management. Nevertheless, it's important to remember that we're still in the early stages of trying to support digital content into the future, and what seems like a workable solution now probably won't be after a number of years. All told, media archives have about 20 years' experience with text databases and half that with large-scale digital image archives. The success or failure of successive migrations after 70 or 80 years won't be known for some time yet, at which point there will be

Dublin Core standard) is developing a series of "semantic units" that describe certain characteristics of a digital object and who created it, all of which are deemed necessary to resurrect that object in the future.

The goal is a core of metadata that stands independent of domain, format, hardware, type of enterprise or how the system is implemented. More than 18 months of intensive work has gone into developing this core suite, which has reached the final draft stage and should be released this spring in the form of a data model and data dictionary explaining all the semantic units. The ultimate translation of these into XML tags will enable the PREMIS metadata to be nested into a larger, more domain-specific, de jure standard such as NISO Z39.87, Technical Metadata for Digital Still Images or others that have been developed — or will be soon.

With the proliferation of approaches to data management, accessibility and sustainability, tracking the various solutions and standards has become a research enterprise unto itself. Enter the "registry" concept, which, in theory anyway, assigns to a third party the task of keeping all of this confusing information straight. Two current registry projects are worth mentioning.

InterPARES (short for International Research in Permanent, Authentic Records in Electronic Systems) is an international research team based at the University of British Columbia in Vancouver that is undertaking the cataloging of all the extant and emerging metadata schemas that in some way touch on the life cycle of digital records. The registry is intended initially to begin sorting out all the overlap and discrepancies among various metadata strategies, looking for commonalities that might suggest a more systematic approach to metadata development. Once the registry is fully operational, an institution or enterprise looking for the optimal schema for its asset or archives systems could search the registry for the appropriate solution.

Meanwhile, the national archives of the United Kingdom has mounted an effort to develop a registry of file formats and their technical requirements, including formats both current and obsolete. Online since February 2004, the PRONOM registry has accumulated an initial database of almost 600 types of file formats, 250 software products and about 100 vendors. Companies such as Microsoft and Adobe have contributed information about their formats to the registry, and an online submission form encourages participation from others.

A registry such as PRONOM offers several advantages. Rather than populating dozens of fields of technical metadata in a preservation scheme, one field might simply hyperlink to the same metadata at the registry. Further, PRONOM researchers hope to offer testing and information about data migration paths, and which formats are facing imminent obsolescence. A major challenge for the project is pursuading software companies to divulge enough useful information in their code to support preservation activity, something they're understandably reluctant to do.

Code is proprietary material, even if it is obsolete.
— *Victoria McCargar*   **TSR**

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no analog original, such as film negatives or prints, to fall back on.

While solutions evolve, news archivists should be asking themselves a few questions that will go a long way toward putting solutions in place, once they emerge, in an ongoing dialog among IT, news librarians and journalists about the process of archiving.

What are we archiving? In the days of shelves and manila envelopes, limits on archives were a function of space, and it was obvious that periodic decisions had to be made about what to discard. One of the interesting developments of the Digital Age is the gradual abandonment of archival policies, written or otherwise, that spelled out what was going to be kept permanently, what was to be kept temporarily and for how long, and what was to be "de-accessioned" outright. Creators and archivists didn't always see eye to eye on the policies, though, so it's not surprising that as technology improved, creators began asking archivists to take in more material than ever before, whether or not they were equipped to handle it.

From a human standpoint, one of the great things about digital storage is that it's compact, convenient and, unlike bulging shelves, out of sight. But the bottomless accumulation of unpublished pictures from photo assignments, for example, is likely to be every bit as expensive, or more, than shelves of prints, if the intent is to keep the files viable indefinitely. And if users, archivists and IT support personnel haven't arrived at a mutual understanding of what the system requirements are, including appropriate expiration or selection strategies, the result will sooner or later be an unmanageable, minimally described mass of data weighed in terabytes or petabytes. Making policies now will save a lot of grief later.

How much is preserving digital archives going to cost? There are so many variables that preservation costs are difficult to estimate, but some researchers put it conservatively at $1 million per terabyte per decade, assuming that the institution has already developed (and paid for) all the necessary metadata analysis and creation; has seamless, reliable, ironclad workflows; and has established failsafe migration paths for all of its format types — three pretty hefty assumptions. In other words, once the expensive work of development has been accomplished, it is still not going to be as cheap as maintaining paper and emulsion in manila envelopes.

Who is going to be responsible? There is a natural partnership to be fostered among information professionals in the news library and technologists in the IT department. Hardware and software, the centerpieces of the IT approach, are only half of the equation. The rest is metadata development, standards compliance and user workflows — the domain of information professionals from libraries and archives. But the system can't succeed without buy-in from users in the newsroom, who need to be included in the development of realistic policies for long-term preservation, as well as help to promote intelligent, compliant workflows among their creative colleagues.

Responsibility extends to understanding standards and compliance, and keeping a close eye on developments in the field. An emerging body of literature about preservation metadata will eventually influence standards, XML schemas and, in turn, systems developers and integrators. See Preservation Metadata: Implementation Strategies, or PREMIS (www.oclc.org/research/projects/pmwg/), for information about one important effort. But since vendors won't develop preservation-aware solutions until customers start asking for them, it behooves media properties to be well-informed about preservation and their own internal long-term retention strategies.

How do we pay for this? Some of the thorniest questions concern how to pay for sustainable digital collections. There are more questions than answers. What is the value of the collection, and to whom? What is the ROI for text, images and other material, such as Web pages and video that is of little or no commercial value, but has intrinsic historic worth? The contents of news archives are the history of a city, a nation, a culture, a snapshot of an epoch of humankind, but if you can't sell it on your Web site, how can you justify the expense of maintaining access decade after decade?

The short answer is that it might not be feasible. The problem might just be too big, too complex and too expensive over time for individual media properties or even their parent companies to sustain on their own.

In the research and academic world, there is ongoing work to scope out models for "trusted digital repositories," third-party entities that have the mission and expertise to take in the digital contents from outside archives and do the preservation work on behalf of their customers, guaranteeing continued access according to a predetermined set of criteria.

Cooperative efforts — perhaps an industrywide project — would leverage what limited expertise exists while the field grows and attracts more practitioners. Research and development funding, moreover, could be spread among a larger pool. But that will still require a concerted effort at standards development and best practices to be a realistic proposition. This will require partnerships between media companies and vendors, as well as rethinking established newsroom workflows.

What about what we have already archived? Another provocative question is, what has already been lost? News databases are full of complicated multiplatform formats, compound, complex objects and nonstandard, locally customized metadata schemas. A standard for preservation metadata is close, but implementation will take a few years. Without these critical components of a preservation-oriented archive, how will old data move forward or how will it be rescued after the fact if migration fails? Is there already a gap in the historic record? Some archivists believe the 1990s are already gone. Only time will determine whether they're alarmists — or actually right.

Fortunately, I know that my Jan. 1, 2005, picture from the devastation at Mullaittivu will be human-readable in 2075. It'll be on microfilm. **TSR**

About the Author
Victoria McCargar is involved in newsroom and library technology support and strategic planning at the *Los Angeles Times*, where she is a senior editor. A frequent lecturer, she is a member of two international teams researching digital preservation and is investigating standards and preservation strategies for the newspaper industry. She is an adjunct professor at UCLA and holds masters degrees in information science and journalism. She can be reached at mccargar@mac.com.

After CTP, What's Next for Plate Manufacturers?

By Kurt K. Wolf

Let's be clear: Digital plate imaging will remain the state of the art in offset printing for decades to come. So why are we discussing what will follow it now? There are two simple reasons: First, it lets us foresee how CTP will develop; and second, it allows us to understand the strategic moves of the major plate manufacturers, who are already preparing for the post-CTP era.

In the area of CTP development, the question is not whether thermal plates or violet plates represent the future; the first step toward the future is the processless plate, which requires no chemical development at all. Although Presstek has offered the processless PearlDry plate since 1995, its highly complex manufacturing process has kept its price too high to be attractive. The plates that Presstek subsequently introduced (such as Anthem and Applause) are also very expensive. On top of that, they can cause technical difficulties on press.

In contrast, Agfa, with its second-generation Azura plate, has a wet-offset offering that is only a bit more expensive than normal thermal plates. It has been enthusiastically adopted by commercial printers and it can be imaged on press.

Computer to press. The second step is the resurrection of computer-to-press (also known as DI, for "direct imaging," offset). This technology had lost some of its appeal during CTP's triumphant sweep through the industry over the past few years. Another limiting factor was press manufacturers' dependence on imaging units purchased from suppliers such as Presstek and Creo, which made the presses significantly more expensive. This caused the market leader in this industry segment, Heidelberg, to develop its own on-press imaging unit at a much lower price.

Heidelberg's quest for financial stability led it to concentrate exclusively on sheet-fed presses, and it sought ways to differentiate its products from those of KBA and MAN Roland. On-press imaging surfaced as the obvious way to do this. I expect this won't be limited to the Speedmaster SM 74 and SM 102, but also will be offered for the SM 52 and Printmaster PM 52. Both of the latter two have automatic plate-changing and can print DI plates such as the Azura as readily as externally imaged plates. In addition, the SM 52 offers the kind of flexibility in press configuration that is usually found in much larger presses. A DI press of this kind would make a more modern and efficient succes-

sor to the 10-year-old Quickmaster DI. I expect to see some very attractively priced models among the DI machines on Heidelberg's stand at the next Drupa.

This leads to the interesting question of how Presstek and Creo might be affected by this development. Presstek will no longer be able to sell Heidelberg its imaging system and PearlDry material for the Quickmaster DI 46-4 Pro, and Creo won't be able to sell its imaging system for the Speedmaster 74 DI.

Newspaper printing. Meanwhile, Zürich-based *Neue Zürcher Zeitung* (NZZ) has become the first newspaper in the world to adopt the Azura plate, on its new Wifag Evolution 471 web press. Since one of the printing towers of this press is equipped for on-press imaging (with imaging heads developed by Wifag itself), Azura plates must be used on the eight printing units of that tower. As a consequence, NZZ has decided to use Azura on all its printing units. In response to NZZ's needs, Agfa has been able to increase the life of the Azura plates to 160,000-180,000 impressions, and NZZ now uses more than 300 Azura plates a day.

Erasable plates. The final step in the evolution of CTP will be the use of erasable plates (or plate cylinders). MAN Roland has already come up with a solution: the
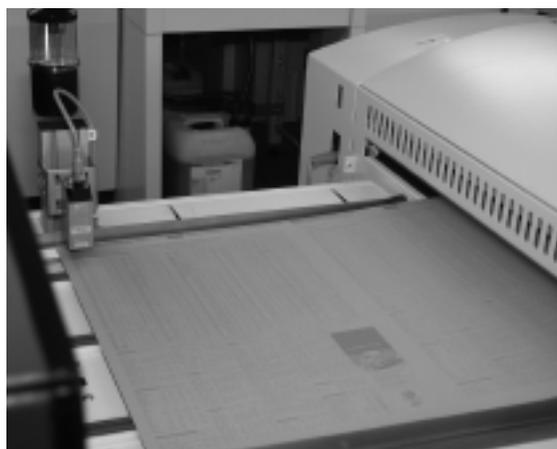
Azura plates are only cleaned and decoated in a rubber solution.

DICOweb, which, although functional, is very expensive because of its construction specifications. For imaging, it uses an elaborate thermal-ribbon imaging head supplied by Creo, making the entire solution so costly that MAN Roland has not yet adopted it for sheet-fed presses. And none of the CTP vendors has satisfied MAN Roland's desire for an external platesetter that can both image and erase plates (like the one Mitsubishi Heavy Industries showed at Drupa).

Back in the 1990s, Creo obtained a patent covering erasable on-press imaging, and demonstrated it using LiteSpeed material supplied by Agfa. Agfa also used LiteSpeed in the production of its first chemistry-free plate, Thermolite. Two press manufacturers are currently testing the technology, but whether this will lead to affordable, commercial presses remains to be seen.

Plate Manufacturers

What is the next step for plate manufacturers Agfa, Fujifilm, Kodak and Creo? All four are trying to strengthen their positions in plate manufacturing and sales, but at the same time they are venturing into digital printing, though each in a different way.

Agfa. Last year, Agfa acquired plate manufacturer Lastra and thus added a robust thermal plate to its offerings. Agfa now has a reasonably complete spectrum of thermal and violet-sensitive plates, along with a clear head-start in chemistry-free plates. In Switzerland, nine of the 20 Xcalibur platesetter users are already using Azura plates, and four more are only waiting for more plates to be available before making the switch.

Agfa's experience with Xeikon and the Chromapress led it to conclude that it is barely possible to make a profit selling high-performance, toner-based digital printing when you have to compete against vendors from the office market. Agfa decided to focus on inkjet printing, where over the years it had developed a core competency in the proofing market. Agfa sells Mutoh printers, modified to its specifications, under the "Sherpa" name. Agfa manufacturers inkjet inks itself in Mortsel, Belgium (including inks for competitors), and also produces 5 million square meters a year of inkjet media.

The future would be an erasable plate or cylinder such as the Creo SP process.

Having sold 7,500 Sherpa devices (not just proofers, but recently large-format printers as well), Agfa is now expanding into other niche markets. In January 2004, Agfa bought Dotrix, allowing it to enter the industrial inkjet and packaging markets. In conjunction with German screen-printing manufacturer Thieme, Agfa developed a flatbed inkjet printer for the screen-printing market for short runs in large formats on both stiff and flexible materials. It is to be introduced to the market in the second quarter of this year.

Fuji Photo Film. The Japanese firm reported more than 18.5 billion euros in sales with 73,000 employees in fiscal 2003/4. Its products and services included (along with film and plates) digital cameras, laboratory equipment, photofinishing equipment, graphic-arts supplies, medical imaging equipment, storage media, LCD panels, digital multifunction printers, and document-management software and services.

Fujifilm has always provided photopolymer plates for contact exposure and for digital imaging at 532nm in its own Luxel internal-drum imagers. Only in the past few years has it developed a thermal plate, which it sells along with the Luxel-T 6000/9600 external-drum platesetter built by Screen. Last fall, Fujifilm announced a thermal plate for newspaper printing.

Ever since the company introduced its own violet-sensitive plate (which can be processed under yellow light), it has offered the Luxel-V 6000/9600 platesetter. This is advantageous for Fujifilm, since it gets the entire manufacturer's share of the proceeds. In Germany, Fujifilm customers have a choice between violet and thermal technology, but in other markets (China, for example) only violet is being offered and sales of violet plates are being pushed aggressively.

For proofing, Fujifilm introduced at last year's Drupa co-branded Fuji/Epson printers embedded in a complete solution that also included workflow (Fujifilm ColorManager) and consumables. Shipments began in the summer of 2004 and so far, Fujifilm group has sold about 1,500 units of co-branded inkjet printers in Europe.

But sales of Epson printers through Fujifilm distribution channels had been going on for a few years before the co-branded products were introduced. The total installed base of Epson printers sold by Fujifilm group in Europe is about 3,500 units.

In January, Fujifilm bought Sericol, the leading manufacturer of screen printing and inkjet inks. For the past four years, Sericol (as the exclusive agent of the firm Inca) has been selling the Spyder, Eagle and Columbia flat-bed inkjet printers. Sericol is active in more than 80 countries, manufacturing products on four continents, and has wholly owned subsidiaries in key markets.

Kodak. The photographic giant has felt the effects of the decline in amateur photography, but (in contrast to

Fujifilm) has not managed to garner a significant share of the amateur digital-camera market. As a result, the company has redefined its business in the past year and has created a Graphic Communications Group to serve the printing industry.

In the area of printing plates, Kodak purchased Sun Chemical's 50% share of Kodak Polychrome Graphics and is now the sole owner of the firm. It would not be surprising if the word "Polychrome" soon disappears from the name. With the addition of violet-sensitive plates, Kodak has broadened its palette of offerings, and with the end of the cooperative agreement with Creo, we expected Kodak to acquire a platesetter vendor so that it could bundle plate contracts with image-setter sales, just as Agfa and Fujifilm have done. Kodak did exactly that, and appears to be on the verge of completing its acquisition of Creo (see story, Page 2).

Kodak entered color digital printing in 1997 in its venture with Heidelberg. Last year, Kodak took over Heidelberg's interest in Nexpress, as well as Heidelberg's digital manufacturing operation, so that now there is once again a single source for the Nexpress 2100 and the monochrome Digimaster printing systems.

Kodak began its development efforts in the large-format market with its acquisition of Encad in 2001. Kodak makes its own substrates and inks for the Encad line.

At the beginning of 2004, Kodak bought Scitex Digital Printing (now called Kodak Versamark), which is very successful in the high-speed continuous inkjet market. Building on this technology, the company is developing printing devices that it thinks will within a few years be on a par with offset in quality and cost-competitive up to 10,000 impressions.

Creo. The latest name change (from CreoScitex to Creo) diverts attention from the fact that the company still consists of about 75% former Scitex employees and products. To defend its imagesetter business against Agfa and Fujifilm, Creo acquired its own plate manufacturing capabilities in September 2003. It has since acquired plate factories in South Africa and the U.S., and now it, too, can bundle thermal plates with its Trendsetter and Lotem platesetter sales. In March 2004, Creo announced a partnership with Sichuan Juguang Printing Apparatus Co. Ltd. (which, with 300 employees and plate production of 18 million square meters per year is one of the biggest plate manufacturers in China). It produces the positive-working Juguang JTP-1 thermal plate, jointly developed with Creo, for the Chinese market.

This January, Creo released to the market the processless Clarus WL thermal plate. It is an ablation plate material on a polyester roll for presses from Heidelberg, KBA and Ryobi, and it competes directly with Presstek's PearlDry polyester plate. In addition to its own plate production, Creo subcontracts plate production to other vendors, such as Ipagsa in Spain.

Creo has had a strong presence in the proofing market with Iris Graphics, and it has continued to push into the large-format market with the Epson 9600 and 10600, as well as the Iris62 Wide (offering them primarily as layout proofing devices, along with the requisite media, however).

As for toner-based digital printing, Creo (via Scitex) has two attractive products in the Spire server and the Darwin variable-data printing package. They are sold directly by Xerox for their printing systems. In exchange, in the summer of 2004, Creo obtained the right to sell Xerox DocuColor printing systems in the U.S. (but not in Europe). Creo obtained this right because Xerox had finalized its distribution agreement for the DocuColor Printer line with Kodak when Kodak bought the remaining interest of Nexpress and Heidelberg Digital last summer. We will be interested to see how Xerox will react when Kodak takes over Creo.

What Happens with Creo?

Since Creo's management and even the dissident group of investors have stated that they will support the takeover by Kodak, it looks like the acquisition will materialize very soon. Agfa and Fujifilm will hardly object, since all three manufacturers will be glad to have one less competitor in the plate business. That's why Kodak and Fujifilm did not object when Agfa took over Lastra.

The takeover of Creo could make Kodak stronger if it uses its marketing power to bundle platesetters with its plates and gains control over Creo's plate activities. But it is obvious that Creo (Scitex) adheres to a completely different business philosophy. Selling consumables is a different business than selling investment products. Creo is driven by a quarterly oriented sales effort that four times a year puts extreme pressure on the sales force. Creo (Scitex) is the most successful player in the global prepress business because its products are stronger than those of its competitors and its sales force is more powerful.

If Kodak decides to integrate Creo into its management group, all the power that today comes directly from the top management downward to the salesmen will disintegrate very quickly. This happened to Linotype-Hell when Heidelberg took it over and Heidelberg's sales organization tried to sell prepress products against Scitex and Creo. The same thing would happen if Kodak takes complete control over Creo. The lesson to "never change a winning team" has been demonstrated in the U.S., and without doubt Kodak's top managers know it as well.

Outlook. It is clear that the major plate vendors have rounded out their plate businesses to make their future as secure as possible. All three of them, however, have been moving into digital printing to be ready if offset printing goes into decline. Just how well the plate vendors will be able to do in these new businesses remains to be seen over the next few years. **TSR**

Print On Demand for Libraries

By Jim Felici

A collaborative program between ebrary and BookSurge will allow libraries fast, inexpensive access to on-demand print versions of online books.

The evolution of book publishing in the Digital Age has taken another small step forward with an agreement between online-publication supplier ebrary (**www.ebrary.com**) and international print-on-demand leader BookSurge (**www.booksurge.com**). Under the agreement, announced in January, ebrary clients, starting with academic libraries, will be able to order print versions of publications currently available from ebrary only in electronic format.

The deal has wide-reaching implications for the publishing business, and although not without complex technological underpinnings, its long-term impact on publishers' businesses and business models is the real story. As Mitchell Davis, senior VP of development at BookSurge put it, "It's more market-driven than technology-driven." For Davis, one of the strengths of the alliance is BookSurge's international reach, with its facilities around the world. "Hard-to-get content for hard-to-reach markets" is how he summarized the company's philosophy.

Although the deal is nominally between the two companies, the negotiation to create the system is really quadrilateral, with book publishers and libraries taking part as well. For their part, publishers have been

Libraries want an easy and economical way to add certain titles to their collections.

loath to get involved in all-electronic systems that essentially dismantle their way of doing business and bypass their traditional means of control. Libraries want an easy and economical way to add certain titles to their collections, because they've found that online material can be ephemeral; once located, it is too often lost and forgotten. The solidity of print gives physical books certain advantages.

"It's only a matter of time before print and digital consuming merge," said David Bass, ebrary's senior VP of sales and marketing. The struggle is to get there in an orderly fashion, and both companies make clear that the movement forward will be in small, measured (and measurable) steps, focusing first on academic libraries. The academic book product is the most viable for this technology, Davis explained, because press runs are small and price is not really an issue. And it's in academia, research and the STM (scientific, technical and medical) markets in which electronic publishing has sunk its deepest roots. In addition, the community of academic library clients is well known to ebrary. This isn't about revolutions, Davis emphasized, and no one should expect any dramatic "tipping of the scales."

The project will soon enter beta testing with a select group of libraries. The only one that the companies were willing to identify was Charleston College of Law, conveniently located in BookSurge's back yard in South Carolina. Although the system is planned to go live in the third quarter of this year, "we're still going through how our back offices will talk to each other," said Bass.

In the short term, the focus will be on delivering single printed titles, either paperback or hard-bound, that will take their place on library shelves just like any other book. The goal, according to Bass, is to eventually have clients aggregate content on their own and create their own bespoke volumes, probably starting with academic course-packs or textbooks. But ebrary and BookSurge first have to demonstrate to publishers and libraries (not to mention librarians) that the system is workable. "It would be great if eventually we could tie this in through the college bookstore," Bass said, "but one of our principal goals is not to disintermediate the library."

How It Will Work

For libraries, the system appeals on many levels. First, it would be a simple interface addition to the existing ebrary system, perhaps as easy as a "Buy this book" icon on screen, followed by familiar shopping cart and other online buying conventions. Pricing would depend on the agreement that ebrary and BookSurge have struck with the publisher (both cut deals on a publisher-by-publisher basis), typically with discounts of 20% to 40% off retail cover prices. BookSurge guarantees shipping within two working days, resulting in delivery

far faster than the eight weeks typically needed to get a book from a publisher's inventory (if indeed it's available there). The publishers' cut is pure gravy because they're completely out of the production and fulfillment loop; they just collect their share of the money. ebrary also collects a transaction fee on each sale.

Ebrary's Bass is quick to note that one of the appeals that ebrary's system holds for publishers is the detailed feedback they get on exactly how consumers are reacting to and using their books. This should help calm publishers' edginess about simply licensing third parties to reprint books on their behalf, he said. In addition, Davis pointed out, printing on demand those titles with traditionally small print runs will help publishers manage their expenses and reduce inventory headaches. "What will go away is guessing about print runs beyond the standing order," he said. Given new technologies and new economies, Davis said, "in five or 10 years we may have a whole new crop of publishers in the STM market."

Attractive as such economies might seem, publishers have many other concerns about e-publishing, including managing and protecting the intellectual property rights of all the content creators and copyright holders, as well as managing the accounting work to make sure everyone is fairly and promptly paid. To most publishers, third-party print-on-demand scenarios can look like a world out of control — at least out of their control. That's why "we've tried to keep the deal extremely simple," Davis explained.

Simple, at least, on the surface. Channel management is a huge issue, said Davis, noting, for example, that although BookSurge can deliver books all over the world, it has to pay attention to publishers' existing rights deals so they don't sell into countries in which, for instance, a publisher has already sold subsidiary rights to a local vendor. All of these issues have to be automated and made transparent for the person ordering a book.

For these reasons and others, Bass noted that he doesn't expect that all of ebrary's titles will ever be available for print on demand. "We'll work with all publishers [currently in the ebrary system] to try to convince them, but we know they won't all buy in."

The Future

Despite the romantic language he uses to describe the BookSurge-ebrary project (hopefully "a long and happy marriage"), Bass wants everyone to know that this is not a "Barney deal," (all hugs and "I love

To most publishers, third-party print-on-demand scenarios can look like a world out of control — at least out of their control.

you's"), nor is it "just an API relationship." Both companies are eager to point out the depth of their strategic relationship and the range of intellectual property they've co-developed. They're in this for the long haul, market willing.

Both Bass and Davis made clear that they had done extensive "due diligence" before heading off on their trail-blazing trek, but Bass admitted: "We really have no idea how the market will respond. If the marketplace doesn't decide it's a good service, we'll have to make some decisions. We think it will work once we've proven that it's a simple thing to do. But it's not all about making money in the beginning. It's still a process in the making between the two companies."

Both companies are optimistic that the publishing community will see the wisdom of their approach. As Davis put it, "The people who are getting it right can recognize each other pretty easily."   **TSR**

In *The Bulletin* Since Last Issue

Volume 10, Number 16
January 26, 2005

Metrics I.T. Strategies estimated that in 2003 a total of 276 billion pages were printed on narrow format inkjet and color EP printers. However, not all pages printed on color printers are printed in color. I.T. Strategies estimates that more than 50% of these pages (152 billion) were printed in color. By 2008, the percentage of color pages increases to 62% (372 billion pages out of a total of 596 billion) a CAGR of 20%.

According to InfoTrends/CAP Ventures research, the worldwide market for inkjet addressing and personalization printers totaled about $116 million at end-user prices in 2004. This figure is growing at about 4.5% per year and is expected to surpass $144 million by 2009. This slow, steady growth rate can largely be attributed to the maturity of the collective market.

Newsstand Publishing Technologies International announced FOGRA certification for ORIS Color Tuner and CGS proofing media; HP settled patent litigation with Intergraph Corp. and the companies entered into a patent cross-license agreement; Pantone Inc. offered a substantial redesign of its flagship product, the Pantone Matching System formula guide, which now includes color swatches that are nearly 25% larger; Océ announced a strategy to develop a digital solution that automates mailroom activities in tandem with digital document and records management solutions. The company also announced the acquisition of the assets of two converting and distribution facilities in Arlington, Texas, and Torrance, Calif., from Precision Paper Company, a supplier of printing substrates to the reprographic industry throughout the southeastern United States; Pitney Bowes Inc. introduced the DM Infinity Series Digital Mailing System, a new family of digital mailing products for the production mail industry; Enfocus Software appointed Saskia Desmet director of international sales; Ames Safety Envelope Company named Kirk Ramsauer president and chief executive officer.

Volume 10, Number 17
February 2, 2005

Schawk Closes Seven Worldwide Acquisition Schawk Inc., one of North America's leading providers of digital imaging graphics services to the consumer products and brand imaging markets, completed its $191 million acquisition of Seven Worldwide, Inc., a global provider of industry-specific marketing execution and publishing solutions to clients in the consumer goods, retail, advertising, entertainment and publishing markets. The transaction was financed with $122.4 million in cash and $68.6 million in Schawk stock.

CIP4 Publishes Interoperability Conformance Specs The International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) announced the publication and availability of technical specifications known as Interoperability Conformance Specification (ICS) documents. ICS documents guide suppliers of the print industry in improving open connectivity and interoperability of their products. Each ICS defines a set of requirements that a JDF-enabled product must meet to interoperate with other conforming JDF-enabled products. The ICS documents define subsets of the JDF specification that contain only those aspects of JDF that a particular class of products need to share.

Heidelberg and Sun Expand Canadian Agreement Sun Chemical Canada and Heidelberg Canada Graphic Equipment Ltd. have expanded the existing distributorship agreement between the two companies announced in July 2003. Under the expanded agreement, effective March 1, 2005, Heidelberg Canada is the exclusive distributor of Sun Chemical sheetfed ink and coating products for British Columbia. Under this arrangement, Heidelberg Canada will assume sales responsibility for all sheetfed printers in British Columbia.

Newsstand Vertis acquired Elite Mailing and Fulfillment Services Inc.; Consolidated Graphics Inc. agreed to purchase Kelmscott Communications LLC, a privately held provider of commercial printing services in five Midwest and West Coast states with annual sales of $100 million; Stora Enso has signed a new 1.75 billion euro syndicated credit facility agreement with a group of 23 banks. The loan, which has a maturity of five years, is for general corporate purposes, including the refinancing of an existing 2.5 billion euro syndicated facility; Presstek Inc.'s subsidiary, Lasertel Inc., has signed a three-year, $7 million supply and distribution agreement with HTOE of Beijing; Flint Ink Corp. made several shifts among its tenured top leadership. H. Howard Flint has assumed the position of non-executive chairman of the board of directors for the company. Dave Frescoln, has been elected vice chairman and CEO of the global company, while Chief Operating Officer Linda Welty has been named to the added role of president. David B. Flint will continue in his position of executive vice president of the family-owned company. **TSR**