November 1, 2002

VISIONEER TARGETS RESELLERS

At **AIIM 2002**, low-end scanner vendor **Visioneer** made some noise about wanting to play in the production document imaging space. Last week, it announced a product that may enable it to do just that. Visioneer, which is mainly known in our industry for its $199 Strobe line of portable document scanners, has come up with a compelling 12 ppm scanner/software package that lists for $699.

Visioneer's 9650i is a color, simplex model that includes both TWAIN and ISIS drivers. It is bundled with **Adobe** *Acrobat* and **ScanSoft** *PaperPort* and *TextBridge* software, and has been certified to work with **Kofax** software VRS (sold separately). It also includes a 25-page ADF.

Visioneer is making the scanner available through document imaging focused distributor **NewWave Technologies**. Visioneer has also contracted industry veteran and former **Pixel Translations** marketing guru Mike Cohn to help move the 9650i.

For more information: Mike Cohn, **Market Consultants**, PH (408) 741-1200, e-mail: MarketCons@aol.com

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We'd like to recognize a pair of document imaging businesses that recently were named to the *Inc.* 500 ranking of the fastest growing private companies in the United States. High-speed scanner manufacturer **IBML** made the list, based on its five-year revenue growth rate of 459%, from $3.5 million in 1997, to $19.7 million in 2001. Greenville, SC-based systems integrator **KeyMark** also made the list, showing a 584% growth rate over five years. KeyMark is a **Hyland** and **Microsystems Technology** reseller whose installations include **Blue Cross/Blue Shield of South Carolina** and the **South Carolina Dept. of Revenue**. ⬛

E-Forms Gain High-Profile Status

The e-forms wars have officially escalated. Within a week of each other, heavyweights **Adobe** and **Microsoft** fired off announcements telling the world about their initiatives in this formerly obscure space. Suddenly, analysts' predictions for explosive growth in a market that was worth maybe a couple hundred million dollars last year, don't seem so far fetched.

"For years we've been beating the drum, encouraging companies to automate their forms," Don Murphy, president and CEO of long-time e-forms software vendor **Shana,** told *DIR*. "I'm really excited about some larger players standing up and beating their drums with the same message. It's going to bring a lot more attention to our space than we've been able to generate on our own."

Defining The E-Forms Market

So, what exactly is the e-forms space? It actually consists of two parts, that may or may not be connected, depending how deep a user wants to take its integration. The first part, which is more directly related to the document capture space, involves collecting data via online forms. These could be expense reports, purchase orders, compliance documents, contracts — really an unlimited number of documents that have traditionally been paper. This is the market Shana plays in. This is also the market that forms processing software specialist **Cardiff** expanded into in 2001 with the release of its *LiquidOffice* software [*see DIR* 4/6/01]. **PureEdge** is another player here. Adobe is also offering technology in this area, and Microsoft plans to next year.

Research firm **Strategy Partners** has defined this space as "document capture from e-forms." According to its report, *Document Capture 2001-3, A North American Perspective*, this market was worth slightly over $100 million in North America in 2000 and is expected to more than quadruple in size by 2003. According to John Richardson of Strategy Partners, e-forms software sales will accelerate as the volume of electronic transactions increases. "Up to a certain point, businesses can get away with ad hoc systems for electronic forms," he told *DIR*. "But as their percentage of electronic transactions

increases, they'll want to install a more stable, structured method for managing them. This will drive sales of e-forms software."

E-Forms Simplify E-Commerce

Dave Clark, director of marketing for PureEdge, explained the anticipated growth this way: "Most IT systems are built with templates on the front end designed to collect data. If for some reason, a business wants a record of the information entered into a template for a specific transaction, it can be very difficult to retrieve. It's not the same thing as going to a file cabinet and pulling out a sheet of paper.

"With an e-form, you not only build presentation capabilities that make entering data efficient, you can add functions like workflow, archiving, and electronic signatures, so the e-forms will mirror the way forms are used in the paper world. As more businesses realize the savings gained by eliminating paper and moving to end-to-end electronic processes in areas such as supplier management, the e-forms market is poised to take off. We expect to quadruple our revenue this year and at least double it annually for the next several years."

E-Forms Can Also Mean Output

The flip side of capturing data from e-forms is outputting data on e-forms. This is a separate, but connected market that involves software for replacing preprinted forms with electronic output. Forms like financial statements, invoices, purchase orders, and even corporate checks are often covered in these applications. Because the data for these forms can come from a capture application, there is some crossover. Companies covered in *DIR* like **CreateForm**, **FormScape**, **Realizon**, **Standard Register**, and **Moore Corporation** play in this space. Adobe, with its acquisition of **Accelio** earlier this year, picked up e-forms output technology as well as input technology.

The XDocs Factor

Because of its close relationship to forms processing, in *DIR*, we focus mainly on the e-forms capture space–which is why we found Microsoft's XDocs announcement so compelling. XDocs appears to be forms creation technology that uses XML data, which can be easily dumped into other applications. In an on-line Q&A document available on the Microsoft Web site, Jean Poli, the XML architect behind XDocs, says, "We think of XDocs as a hybrid tool, because it provides the best of a traditional document editing experience, such as a word processor or e-mail program, with the rigorous data capture capabilities of forms."

Poli adds that while XDocs can be used for "traditional forms, like purchase orders and equipment requests, what's innovative is that XDocs squarely targets information that historically has been more difficult to capture, like business critical data contained in sales reports, inventory updates, project memos, travel itineraries, and performance reviews."

While Shana's Murphy acknowledges he does not want to

underestimate Microsoft, he is not sure XDocs plays in the same space as Shana's e-forms software. "Over the years, we've seen a lot of ways to automate a few forms, but only a few ways to automate a lot of forms. We deal with thousands of users in organizations with thousands of forms. True forms management is quite different than the ad hoc creation of forms for data collection."

According to Murphy, one of the key features of Shana's software is the ability to create a form once and have it look exactly the same in several different formats— including print. "We have had success in environments like aerospace manufacturing, where there are a lot of regulatory compliance issues. Our software is very good at making sure the right version of the right form is presented to the right person, every time," he said.

Murphy added that Microsoft's XDocs structure is something that might fit nicely inside Shana's e-forms management tools. "We will be looking for ways to complement XDocs as opposed to competing with it," he told *DIR*.

XDocs Far From A Complete Solution

This complementary strategy is also favored by Cardiff. "We see XDocs as just another e-forms standard, and if it's open and gains some adoption, we may choose to support it like we support PDF and the soon-to-be finalized x-forms standard," Dan Shirra, Cardiff's VP of worldwide marketing, told *DIR*.

Shirra acknowledged that Microsoft's omnipresence on the desktop will definitely carry some weight when users are considering XDocs. He also pointed out several reasons he believes XDocs does not offer a complete e-forms solution. "From what we understand, end users will need the latest version of Microsoft *Office* to support XDocs technology, and that type of upgrade is not going to occur overnight," said Shirra. "In addition to operating across several versions of *Office*, *LiquidOffice* can be run on Unix, Linux, and mixed infrastructures.

"Further, XDocs are designed for electronic presentation, and it looks like they will present users with many of the same printing problems you run into with HTML documents. Finally, there is no workflow, routing, and repository capabilities in

XDocs like we offer in *LiquidOffice*. Microsoft is recommending the use of *SharePoint* to solve this, but that will mean additional integration and infrastructure costs."

On top of all this, the first generation of XDocs will not ship for at least six months. Cardiff is already shipping version 2.1 of *LiquidOffice,* and Shana has been in the market since 1985. "There are issues related to e-forms that have taken us some time to figure out," said Murphy.

Added PureEdge's Clark, "We've offered XML-based forms technology since 1997. All Microsoft has done is help legitimatize technology we've offered for years. I

> **"We've offered XML-based forms technology since 1997. All Microsoft has done is help legitimatize technology we've offered for years."**
>
> **Dave Clark, PureEdge Solutions**

was actually very excited when I saw what their XDocs announcement included."

Adobe Provides More Immediate Threat

So, while Microsoft's XDocs may not be an immediate threat to current e-forms vendors, the threat from Adobe is clearly more imminent. Adobe leapfrogged its way from Cardiff caddie to first-rate e-forms player earlier this year with the $72 million acquisition of market leader **Accelio** [*see DIR 2/15/02*]. Last week, Adobe announced it had officially rebranded the Accelio products. In addition to adding features to these products, Adobe announced two new "server-based" software products targeted at the e-forms space. Curiously, both new products are similar to products already released by former partner Cardiff.

■ *Adobe Document Server for Reader Extensions* – This product gives anyone with a free *Acrobat Reader* the ability to electronically fill in PDF forms — if the creator of the form grants those rights through its *Adobe Document Server* software. Cardiff introduced similar software with a proprietary client at **AIIM 1999** [*see DIR 6/4/99*].

■ *Adobe Document Server* – This product automates the output of customized PDFs. It can leverage feeds from databases and applications such as ERP, CRM, and document and content management systems. It can be used to produce customized technical manuals, brochures, reports, and policies. It can also produce customized forms with pre-filled fields. In 2000, Adobe sold Cardiff a spin-off, **AudienceOne**, that also developed software for producing customized PDF documents from database information [*see DIR 3/3/00*].

An Adobe representative told us the new *Document Server* is much more sophisticated than the technology developed by AudienceOne. Document technologies analyst Harvey Spencer of **Harvey Spencer Associates** shares this opinion. "Adobe's *Document Server* leverages the workflow technology Adobe acquired with Accelio," he told *DIR*. "This enables users to route documents through several systems to create complex outputs. It also leverages standards like SOAP, XML, and Java that will enable it to operate in a Web services environment."

In addition to these two new products, Adobe also announced it has PDF-enabled the Accelio e-forms capture software and added management of feeds from **Oracle** and **SAP** applications to the Accelio output technology. "At some point, we'd like to add support for an even broader range of applications, including those from vendors like **Siebel** and **PeopleSoft**," Julie McEntee, Adobe's director of product management for server products, told *DIR*. "We'd also like to add a Web services architecture to the Accelio products, which will help us better address e-forms on the enterprise scale. That is where we view the true value of e-forms solutions."

A New Business Model For Adobe

Yes, with the acquisition of Accelio, Adobe announced it was going to expand the breadth of its marketing, from its traditional desktop model, into the enterprise server model. The recent e-forms announcements clearly represent a move in that direction.

Bruce Chizen, president and CEO of Adobe, made the following statement on the day of the *Document Server* product announcements. "Large organizations have invested heavily in automating back-end enterprise systems and core business functions, but when it comes to presenting and acting on information, documents are still the fundamental currency of communication. Because document workflows are still largely manual and disconnected from enterprise operations, businesses suffer from inefficiencies they haven't even diagnosed. Adobe's strategy is to leverage its franchise in Adobe *Acrobat*, and expertise in document technologies such as PDF, to make these problems a thing of the past."

Cardiff President and CEO Dennis Clerke, however, questions Adobe's ability to sell successfully on the enterprise level. "It takes more than a 'server message' and some PR to turn a message into customers," Clerke told *DIR*. "To date Adobe, (and Accelio before that) has struggled to develop the channels, direct sales, and enterprise level support that will truly determine success in the e-forms market."

With the 7,000 customers it acquired with Accelio, Adobe does have a head start on its competitors. As of last month, Cardiff had 75 *LiquidOffice* installations. Clark told us PureEdge has approximately 200 customers, while Murphy said Shana has "several thousand" installations.

According to McEntee, the strongest early acceptance of Adobe's e-forms server products has been in the government arena, which also was a stronghold for Accelio. "A lot of government agencies have PDF documents they make available to the public, as well as HTML and XML solutions for internal forms," she said. "They really like the idea that one vendor can now provide them with a unified solution for both these applications."

According to Shana's Murphy, he has not seen Accelio any more or any less in bids since it was acquired by Adobe. In a **Dow Jones Newswire** article, analysts estimated the Accelio business is contributing about $10 million per quarter to Adobe's revenue stream. This would represent approximately a 33% decline from Accelio's fiscal 2001, when it reported revenue of slightly more than $100 million Canadian.

More Than One Way To Skin The E-Forms Cat

Regardless of how much success Adobe is currently having selling enterprise solutions, it is certainly a force to be reckoned with in the emerging e-forms market. To help level the playing field a bit, 60-employee PureEdge just added a fifth round of financing, which will be used to increase its sales and marketing channels. "For years, we had the product to compete with Accelio, but we weren't really competing, because we didn't uncover enough opportunities," said Clark. "Accelio was winning by default."

Another way to compete with larger vendors is through partnerships. Shana recently signed one with document imaging kingpin **FileNET** [*see DIR 3/1/02*] and is currently seeking to form alliances with other types of applications vendors. "If it's done correctly, there is no reason an e-forms application can't sit on top of any type of application," said Murphy.

Cardiff, meanwhile, announced a partnership with **Xerox** last month [*see DIR 10/18/02*] and recently released an OEM-specific version of *LiquidOffice* [*see story on page 5*].

There is no question that the e-forms market is growing. The question is, who will cash in on this growth? Murphy may have summed it up the best: "This is going to be a big space, and there is a lot of

room for a number of perspectives on how forms are handled within organizations. On our own, we haven't been as successful as we would have liked in building the forms space. Because of that, we welcome the visibility vendors like Adobe and Microsoft will provide."

For more information: **Shana**, Edmonton, Alberta, Canada, PH (780) 433-3690; **Cardiff**, Vista, CA, PH (760) 936-4500; **PureEdge Solutions**, Victoria, BC, Canada, PH (253) 761-2492; **Adobe**, San Jose, CA, PH (408) 537-6000; **Harvey Spencer Associates**, E. Northport, NY, PH (631) 368-8393, e-mail: admin@harveyspencer.com; **Strategy Partners**, John Richardson, Berkshire, UK, PH +44 1753 592787, e-mail: john.richardson@strategy-partners.com.▣

Kofax First LiquidOffice OEM Vendor

Away from the glitz and glitter of the **Microsoft** and **Adobe** e-forms announcements, **Cardiff** continues to plug away, forming partnerships to help increase the sales of its *LiquidOffice* e-forms technology. Cardiff's latest ally is image capture specialist **Kofax**, which has agreed to package an OEM version of *LiquidOffice* with its *Ascent Capture* software. *LiquidOffice Data Collection Edition for Ascent* will include forms creation and data collection technology, but not the workflow technology included with the full *LiquidOffice* product.

"We are in the capture business, not the e-forms business," David Oldfield, director, product management, at Kofax, told *DIR*. "*LiquidOffice* e-forms will now be another type of document that our users can capture with *Ascent*. Once the document is captured, it can be entered into whatever type of workflow sits on the other side of *Ascent*."

Oldfield sees the *LiquidOffice* module as particularly appealing to *Ascent* customers who have Web order forms or service forms. "Last year, we introduced into *Ascent* the ability to capture electronic documents [*see DIR 4/20/01*]," Oldfield told *DIR*. "We've seen customers use this capability to capture contracts written in *Word* and when transferring batches of previously imaged documents from one repository to another. We haven't seen them hooking it to up to their Web sites to capture e-forms. To do that has previously required customized scripting, which can be eliminated through our integration with *LiquidOffice*."

Kofax will introduce the *LiquidOffice Data Collection Edition for Ascent* early this month. It will be made available to *Ascent's* over 800 resellers worldwide. List price will start at $15,000.

Cardiff VP of Worldwide Marketing Dan Shirra said *Ascent* is just the first of many software programs with which Cardiff plans on integrating the *Data Collection Edition* of *LiquidOffice*. "A lot of businesses that are just starting to transition from paper forms don't realize the advantages workflow can add to e-forms applications," he told *DIR*. "They are just thinking about ways to put paper forms on-line. If we can get in the door through other vendors offering a forms design and data collection

WEBCAPTURE GAINS TRACTION AS IMAGING MODULE

Kofax is not the only imaging vendor that has ventured into the Web forms capture space. In 2001, Australian image archive specialist **Tower Technology** introduced its *WebCapture* software, designed to archive Web pages exactly as they appear during Web transactions [*see DIR 2/16/01*].

Initially introduced as a standalone application, Tower VP of Corporate Marketing Bill Zastrow told *DIR* that the product has had more success as an add-on module to existing Tower imaging installations. "We've found that the same businesses that value scanned and archived documents, also value archived Web pages," said Zastrow. "This includes businesses in insurance, government, and financial services—industries where documents are highly valued. In cases where Web transactions are replacing paper transactions, capturing the Web pages is as important as archiving the paper documents."

Zastrow estimated that Tower has 18 *WebCapture* installations, six standalones and 12 add-ons. "We introduced the add-on version of *WebCapture* a few months after the full-version, but it's being adopted at a faster rate," Zastrow told *DIR*. "In addition to the synergies I mentioned, if a user is buying *WebCapture* as an add-on, it means it already has a document repository in place. This can be an expensive piece of infrastructure

to add. For the standalone version, most of the traction is coming in government. Countries like Canada and Australia have issued regulations that all government Web transactions must be archived."

Tower has also signed OEM partners who are offering *WebCapture* as a piece of e-commerce or e-mail archiving solutions. Zastrow estimated the average selling price of a *WebCapture* installation as $110,000. "You've got to remember though, our average-sized imaging deal is around $2 million," he told *DIR*.

For more information: **Tower Technology**, Boston, MA, PH (617) 236-5500.

application, we think we can come in later and sell the complete e-forms package."

Shirra estimated a complete *LiquidOffice* solution would list for approximately double a similar-sized *Data Collection Edition* sold through OEM channels.

Dicom Brings Companies Together

LiquidOffice Data Collection Edition for Ascent marks the first software integration between Kofax and Cardiff since Kofax parent **Dicom** spent some $14.3 million to acquire 19% of Cardiff [*see DIR 3/16/01*]. Previously, the companies had announced that Kofax's VRS image processing technology was certified to work with Cardiff's *TELEform* forms processing software [*see DIR 5/17/02*].

"Dicom has a substantial investment in Cardiff, and since that investment was made, Kofax has been working with Dicom to find some common ground where the two companies could work together," Oldfield told *DIR*. "*LiquidOffice Data Collection Edition for Ascent* is a logical place to start."

When we asked Oldfield if we could possibly see future integration between *Ascent* and *TELEform*, he returned an emphatic no. "We will certainly still be competitors fairly often," he concluded.

For more information: **Kofax Image Products**, Irvine, CA, PH (949) 727-1733; **Cardiff**, Vista, CA, PH (760) 936-4500. ▪

A Look At What $1 Billion In R&D Buys

Xerox desperately wants to be known for technology. Yes, the company that invented the office copier and is often given credit for inventing the PC (and then letting it walk out the door to **Apple**) still invests heavily in R&D. At a recent Tech Day held at Xerox's Webster, NY, research facility, Chief Scientist Hervè Gallaire told a crowd of media professionals that in 2001, Xerox (not including work done with partner **Fuji Xerox**) spent approximately $1 billion in R&D. "Of that figure, $50-60 million was spent on what we call the big "R," or research for the sake of research," he said.

Ah, yes Xerox's fabled **PARC** laboratory is legendary for the big "R" work it has done over the years. But amid restructuring earlier this year, didn't Xerox announce that PARC was up for sale? It turns out, with the value of technology research on the open market not being what it was a few years back, Xerox has decided to hang-on to PARC — although it has announced a plan for offering contract-based research to non-competitive companies. "We need

to be more aggressive and business-like in the commercialization of PARC," acknowledged Xerox Chairman and CEO Anne Mulcahy, who also spoke at Tech Day. "However, I do want to stress that we are not walking away from research for research's sake, just reigning it in a little bit."

For more information: **Xerox Corporate Headquarters**, Stamford, CT, PH (203) 968-3000.

Advancing Color Digital Printing

It was with this message fresh in our minds that we were led on a tour of the research facility and introduced to several scientists doing cutting edge work for Xerox. The highlight was a stop at the manufacturing facility for the iGen3 digital production press, which was introduced at the recent **Graph Expo** held in Chicago. The iGen3 is aimed at the offset printing market and features brand new color digital printing technology. The machines start at $510,000 and can be configured in a variety of ways.

The iGen3 is a follow-on to Xerox's extremely successful DocuTech line. According to Xerox representatives, digital printers have historically had a hard time matching the color quality of offset machines, a problem Xerox claims to have solved with the iGen3. Because it's digital, the iGen3 also offers the advantage of being able to customize its output. It is most cost-effective when used on runs of 5,000 or smaller.

For more information: **Xerox Wilson Center for Research and Technology**, Webster, NY, e-mail: sbolte@crt.xerox.com.

Color Prints Will Always Cost More Than B&W

No, the iGen3 is not a direct fit with the markets typically covered in *DIR*, but it is another step in the advancement of color printing, which at some point is going to come around and drive the adoption of color scanning. One issue that has prevented the full-scale adoption of color printing is, of course, the premium to print color documents. At Tech Day, *DIR* had a conversation about this subject with Jim Forrest, managing editor of *The Hard Copy Supplies Journal*, a newsletter which covers the printing space. Forrest estimated that it is still on the average eight times more expensive to print a color document than a black-and-white one.

"The cost to print color has come down significantly in recent years," Forrest added. "However, color printing will never be even with black-and-white printing. There are two reasons for this: Number one, color documents typically employ more graphics and have less white space. So, more

of the page is covered with ink. Number two, creating color requires ink from four different cartridges, while black-and-white printing uses only one cartridge."

Despite this price differential, at Xerox, all research being done involves color. We were told Xerox views bi-tonal printing as a subset of color.

For more information: **The Hard Copy Supplies Journal**, Newtonville, MA, PH (617) 454-2600, e-mail: jforrest@lyra.com.

Xerox Exploring MRC On Several Fronts

We did see an interesting crossover between document imaging and color printing in Xerox's use of MRC (mixed raster content) technology to drive office printers. Xerox demonstrated how it uses MRC technology to break up and compress complex images before sending them to printer drivers. This procedure helps reduce the bandwidth required to transport the images and speeds up the printing process.

Interestingly enough, it was a conversation about MRC, which we had with Xerox researcher Rob Buckley, that got us on the invite list for Tech Day. Buckley recently presented a paper on the MRC imaging work Xerox is doing with the **William Blake Archives**. "At the Blake Archives, we are applying MRC technology to images of hand-painted engravings," Buckley told *DIR*. "MRC technology allows us to recreate those images digitally, the same way Blake did manually. We can separate the images of the engravings from the hand-painted colors applied to them."

As far as more traditional document imaging is concerned, MRC is the concept behind the document specific JPEG 2000, Part 6 format — a standard for which Buckley is the co-editor. JPEG 2000, Part 6 proffers a standardized way for separating textual and graphical elements of document images to create highly compressed images with sharp, clear text. [*See DIR 10/19/01 for a more detailed explanation of JPEG 2000, Part 6.*]

The proposed file extension for the standard is JPM. A JPM file can serve as a wrapper for the various layers into which a document is separated through MRC technology. "There could be several different profiles for JPM files, but currently we have defined one—the Web profile," said Buckley. "This profile accounts for Group 4, JPEG, JPEG 2000, and JBIG2 elements in a document."

According to Buckley, the JPEG 2000, Part 6 standard is currently going through a two-month ballot for final approval as an ISO standard. "We

expect to know something about the results before the end of the year," Buckley told *DIR*. "I expect technology for creating and viewing JPM images to be available sometime next year, although I'm not sure if it will have reached the commercial stage. Xerox is not, by any means, the only vendor working on JPM technology. Several vendors have contributed to the creation of the standard."

Xerox currently has an early version of its MRC technology available for download at www.alphaave.com, under the technologies section, code named *Silx*.

According to Buckley, one of the most exciting characteristics of the JPM format is that it allows for each element in a document to be handled separately. "This enables users to do things like reuse the same element on multiple pages in a document," he said. "It also enables users to interact separately with different elements of a document. So, if there is a particular graphic a user wants to view in more detail, this can be done without increasing the detail of the other elements on the page."

This type of technology can be especially valuable when working with low bandwidth connections, such as those typically used with mobile computers. And indeed, it seems Xerox is already employing a similar concept in the next generation of its *mDoc* document management technology for mobile computers.

For more information: **Xerox Wilson Center for Research and Technology**, Webster, NY, e-mail: RBuckley@crt.xerox.com.

Mobile Technology Adds Image Viewing

Previous versions of *mDoc* have not been image enabled. They've only allowed users access to meta data from document images. Users could either print or e-mail the images for full viewing later. *mDoc's* next generation, scheduled for release next year, offers viewing capabilities for any type of rasterized image.

At first, what appears on the screen is a fuzzy image of a complete document. As a user zeroes in on a specific area, that part of the image becomes more and more clear. "Only data for that specific part of the image is transferred to the mobile computer. This is a much more economical use of bandwidth than transferring a high-resolution version of the complete image," explained Emil Rainero, development manager for Xerox mobile solutions.

For more information: **Xerox Wilson Center for Research and Technology**, Webster, NY,

Picture This: OCR For Digital Cameras

Xerox has also developed document imaging software for another type of mobile computing device—digital cameras. The company's European research team has developed an image clean-up and OCR application to facilitate image capture and full-text indexing with off-the-shelf digital cameras.

"For the OCR software to work effectively, a digital camera should offer a minimum of 2.1 megapixels of resolution," Patrick Mazeau, manager, technology showroom, Xerox Research Centre Europe, told *DIR*. "Cameras of that quality are just starting to hit the mass market, and we hope to arrange OEM deals with the vendors. We think our software could be a differentiating feature."

Mazeau estimated that OCR software for digital cameras would reach the market sometime next year. "We see the size of our market growing as digital cameras are embedded in devices like mobile phones and PDAs," he added.

For more information: **Xerox Research Centre Europe**, Meylan, France, PH +33 (0)4 76 61 51 74, e-mail: Patrick.Mazeau@xrce.xerox.com.

Improving The Viewing Experience

Xerox is also working on technology for making the viewing of documents more convenient. This includes developing materials that look like paper, and are priced like paper, but can display the dynamic document content typically associated with computer screens. Work in this area includes development of organic light-emitting diode (OLED) technology as an alternative to LCD and the development of methods for creating plastic transistors as an inexpensive alternative to silicon transistors. Expect this type of technology to start appearing commercially over the next few years.

For more information: **Xerox Research Centre of Canada**, Mississauga, ON, PH (905) 823-7091; **Xerox PARC**, Palo Alto, CA, PH (650) 812-4000; **Gyricon Media**, Canton, MA, PH (508) 400-2175.

Partnerships Key To Bringing Technology To Market

With the U.S. technology market in such an awful economic downturn, many people have expressed fear that research to develop cutting-edge technology will have a hard time getting funded. And while this may be true, especially for start-ups, giants like Xerox realize they have to do at least some research if they don't want to go the way of Smith-Corona. It's probably open to debate how well Xerox has succeeded in avoiding this trap so far.

Regardless, Xerox clearly continues to fund some cutting-edge research in the area of documents. If you're a small company and don't have cash for your own research, you might want to look into partnering with Xerox. Despite Chairman and CEO Anne Mulcahy's stated goal at Tech Day of "Xerox technology delivered by Xerox people," history has proven this has not always been the case. And a recent series of partnerships and initiatives launched by Xerox in the traditional document imaging and management markets shows they clearly value your expertise and your market. DIR

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