IMAGE PRINTING DIGEST

Vol.9, No.1 *News briefs from the dynamic digital printing industry* Winter 2002

Route to_____
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Ink Jet Success Continues

Scottsdale, AZ - Of all the **Information Management Institute** technical conferences, a filled ball room seems always to greet attendees of the **Ink Jet Printing Conference**. For ten consecutive years, hundreds of technical ink jet professionals have attended these intensive, state-of-the-industry, interactive gatherings. The advancement of the industry is a continuing marvel. With innovative ideas, engineers and inventors keep the industry moving by improving inks, reducing ink droplet size, increasing print head nozzle quantities, receiving new patents for improved mechanisms, sponsoring new market targets, and adapting to various media application. Attendees from Asia and Europe were in the mix of alert, interested participants who came to see where the breaking wave lies and where it is trending.

Dr. Ross Mills of **iTi Corp**., Boulder, CO keynoted the 2001 conference as he has for the past ten years. Mills opened a far reaching program reviewing basic ink jet technologies with an appropriate mention of competing print methodologies. **Thomas Ashley, CAP Ventures**, Norwood, MA blessed the technology with another bullish market prediction of continued growth in virtually every market segment.

Ink jet printing dominates the big and small office markets and manufacturers are probing other major industries to conquer. Among the targets is the huge textile printing industry — long dominated by screen printing. Ink jet printers offer an economical alternative with a quick setup and faster processing. Since most textiles are woven in less developed countries with low labor costs, digital printing is less of an incentive than in high labor cost industrial nations. The new ink jet systems bring economies to industrialized first world companies but face a barrier of distance, culture, low indigenous labor costs and an established printing system in third world countries. Existing textile screen printers that are paid for leave little incentive for change. The advantages of productive ink jet textile printing with low setup costs and competitive color capability offers

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When will the Smart Card Craze hit the U.S.?

In August 2001, a **New York Times** front page feature questioned whether chip based smart cards would ever find themselves into the U.S. consumer's wallet. Ten years ago, European banks had embraced the smart card to thwart a security breakdown. Computer savvy techno-thieves used brute force to beat the PIN number security system used by magnetic stripe cards. No question, chip cards offer excellent security and sophisticated encryption, thus they were preferred by governments and banks in Europe.

U.S. consumers are satisfied with the reliability and pervasiveness of magnetic stripe cards. Low cost mag cards support reasonably secure bank access, easy credit verification and ATM cash convenience. Surprisingly, the largest application for U.S smart cards are the 10 million that secure, activate and identify TV satellite dish receivers.

American Express blazed its own success with an aggressive, effective campaign that placed 2.2 million Blue smart credit cards into young, cool executives wallets. The flashy credit cards, with microchip, had a faddish appeal which included a free PC electronic card reader. The reader for secure Internet buying is now abandoned, yet the marketing success of American Express Blue was substantial.

Despite American Express' smart card success, the U.S. accounts for only 2% of the world chip card market. This may be about to change. **Bill Gates** and advancing technology will make this happen. Gates is promoting **Microsoft Windows for Smart Cards 1.1** as the operating system which adds e-mail and other applications to your mobile phone and PDA. Gates competes with **Scott McNealy** (**Sun Microsystem**) whose **JavaCard** is established in Europe. Both Sun and

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Ink Jet Printing
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textile companies a competitive advantage in speed-to-market.

Another growing market for wide and grand format ink jet printing is large graphic applications including outdoor signs, exhibition graphics and truck and bus signage. Ventures into large graphic printing, similar to textile printing, are now dominated by screen printing. In the wide graphic printing industry, ink jet digital printing with permanent inks, offers quick set up and endless variety to replace a labor intensive screen process.

Recently, ink jet printing mechanisms have attracted interest as a reliable control system for dispensing fluids outside of the graphics industry. At the IMI Ink Jet Conference, **Dr. James Caruso, Superior MicroPowders**, Albuquerque, NM outlined a new use for deposition of phosphors in the manufacturing process of flat panel displays.

The search for better ways to manufacture flat screens as a replacement for cathode ray tubes (TV tubes and computer screens) has led Dr. Caruso to experiment with ink jet systems. His intent is to improve on the existing process — again, a screen printing process. While the trend in office ink jet printers is towards smaller drops and small nozzles, deposition technology requires larger particle sizes and larger nozzles. Dr. Caruso's experiments indicate that piezoelectric ink jet mechanisms may well be adapted to handling pastes and high viscosity inks.

Other micro electronic manufacturing applications may use ink jet deposition techniques for circuit board production. An example is ink jettable conductors. A new market is developing for this new deposition technology which could bring the large electronics manufacturing industry into the orbit of ink jet print head manufacturers.

Those who attended the **10th Annual Ink Jet Printing Conference** came away with new ideas and well founded optimism for the future. <

Thermal Printing: Survival & Growth

Scottsdale, AZ - In 1989, **Information Management Institute, Inc.** launched its first Thermal Printing Conference in Cambridge, MA amidst exploding interest and enthusiasm for a new print technology. From a beginning of printing readable Japanese characters and numbers on tickets for the Tokyo subway, thermal printing added direct imaging heat reactive leuco dye coated media to produce a high speed, non-impact, variable printing technology. Expanding from this dependable computer driven technology, facsimile machines were developed to replace telex machines throughout the world.

Thermal printing is now a mature technology, its strengths and weaknesses well known. In some applications, other non-impact digital printing systems, have replaced thermal printing with ink jet or electrophotographic devices. A positive for thermal printing is a whole industry created to support automatic data capture using bar codes. Thermal printers are a reliable source of quality bar code images for the automatic reading of alphanumeric information into a computer system.

As digital photography grows and wide format outdoor poster printing is perfected, new opportunities for thermal printing emerge. At the IMI 2001 conference, marketing experts listed the pluses and minuses of market trends concluding with optimistic forecasts for specialty markets and double digit yearly growth expectations.

Harold Schofield, president of **Atlantek, Incorporated**. Warwick, RI keynoted the 2001 thermal conference. Schofield gave a sweeping view of the thermal printing market. He estimated $1 billion per year for thermal printer hardware and an additional $2 billion for media and supplies. He predicted new twists and innovative applications that will grow the industry at 11% per year.

Other conference speakers were similarly enthusiastic:

- **Ken Freund, CK Industries**, Irvine, CA who predicted future growth in wide format printing in poster printing and outdoor graphics.
- **Bob Martin**, President of **MarComm Results**, Allen, TX sees breakthroughs in kiosk printing building on the base of 273,000 U.S.

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Tag, Tickets & Labels: a Healthy Market

Orlando, FL - The durability of industrial marking survives in the e-business world as business management programs offer new growth opportunities. While bar code labeling reaches maturity, its application to enterprise resource planning (ERP) or supply chain management (SCM) systems is expanding. At **Information Management System**'s **11th Annual Tag, Ticket & Label Printing Conference**, **Lou Sickenius** of **IBM**'s Printing Division, Boulder, CO, emphasized that "Thinking outside the label" is an apt theme for automated marking systems. It is essential to reliably identify each unit as it moves through the corporate process, thus the bar code becomes a vital link to an ERP system.

While a large infrastructure of bar code label applications exists, new uses are expected for radio frequency marking (RFID). Radio frequency information acquisition eliminates manual optical scanning. An automated system with radio transmitters constantly searching for printed tags creates an environment that could replace a bar code scanning system. Reliability needs impprovement and the high current cost of RFID tags are inhibiting factors.

RFID labels come in two flavors: active and passive tags. The active tag contains a miniature radio transmitter which can be more reliable (and more expensive) than bar codes or passive tags. Less expensive passive tags can be printed on a label or directly on a package. According to **Eitan Avni** of **International Paper Company**, Cincinnati, OH, newly developed e-inks can reduce tag costs to bar code printing levels. No doubt, RFID presents a growing opportunity for current bar code system leaders **Zebra Technologies Corporation**, Vernon Hills, Il and **Intermec Technologies Corporation**, Everett, WA. These companies and others will upgrade or offer a hybrid system to add RFID capability when reliability and cost of use allows.

Per Frost of **Spectra, Inc.**, Hanover, NH sees thermal transfer and ink jet label printing expanding in house to replace flexographic label printers long established as the production printing system of choice. A rivalry between flexo , TTR and high performance piezo ink jet is underway with flexographic printing press manufacturers adding digital nodes to their presses. Thermal transfer printer manufacturers are driving costs down and print speeds up to compete for this market.

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Smart Cards *(Continued from page 1)*
Microsoft hope to replace England's **Mondex** with a new, better and secure smart card operating system.

Mondex, and its international subsidiaries, appears to be in financial trouble as their institutional base struggles to compete. Mondex's championship of smart card cash using an "electronic purse" (a prepaid cache held in smart card memory) has not caught on. Using a cash card rather than coins and bills may seem useful, but few real world trials have succeeded.

In Europe, starting from a base of phone cards, bank cards and cell phone SIM cards, billions of smart cards are at work. The smart card microchip memory is sizable compared to a sharply limited magnetic stripe card. The mag card depends on a computer connection to function, while smart cards are more self contained. As smart card chip memory has expanded, the card acts like a miniature computer. As happened during the early days of the personal computer when capability outstripped applications, the smart card has underutilized capability. The hope of Gates, McNealy and other smart card proponents is to convince the public to replace a handful of mag cards with a smart single card able to do many things. That is why American Express Blue chose the smart card in its market pacing campaign.

The U.S. government is ahead of the private sector in choosing smart cards for secure identification and multiple applications. The **Department of Defense** and the **Department of Veterans Affairs** are soon to issue a new smart card to 8 million clients. All cards will be capable of multiple functions including: secure identification, building access, payroll benefits, credit services and computer access.

For the private sector, future applications include combining the functions of every card in your wallet. Driver's licenses will contain secure personal identification information. Health care cards will add a medical history. Bank cards will include current balances, loyalty points and portfolio updates. Phone cards will add Internet access and be capable of financial transactions. Card use, properly authenticated, could be used to legally bind an individual just like a personal signature.

Projections indicate smart card industry growth at a faster rate than the personal computer industry in the years ahead. These growth prospects appeal to Microsoft and Sun who see billions of cards to be made, printed, encoded and used each year. The U.S., though late arriving, is expected to participate. <

Thermal Printing
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ATM machines. A promising, new application is in-store information kiosks being beta tested by **Wal Mart** that aid shoppers.

• **Dan Hannan** of **Eastman Kodak**, Rochester, NY and **Mr. Matzkawa** of **Fuji Photo Film** presented new developments in digital photo-finishing which may eventually supplant film-based photography. Standardization of software, digital imaging, and print output technology will enable the photographic industry to simplify home-print photography.

The photographic industry is developing new processes that will move the massive, film-based worldwide photography industry to new systems and thermal printers will be included.

The IMI Thermal Printing Conference interfaced with the **8th Annual ACT Color Thermal Transfer Conference** with some sessions jointly held. The **Association of Color Thermal Transfer Technology, Inc**. (ACT) promotes color printing using thermal transfer printing technology. **Rick Wallace**, ACT's Executive Director, reviewed color thermal printing's future. Markets cited were screen printing replacement, digital photography, novelty heat transfer applications (tee shirts, coffee cups), identification and credit card printing, decals and labels.

The ACT conference highlighted presentations by: **Rimage, Primera, 3M, Atlantek, Graphtec, Versaprint, Summa, Matan, Astro-Med, Roland, Gerber, Datamatric** and **Direct Color Systems.** <

Tags & Labels
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While TTR is an established, proven digital printing system it has the disadvantage of high supply costs (ribbons). Specialized ink jet printers for label production have low operating costs but need to establish reliability for barcode printing. Both ink jet and TTR offer easy data integration into a production control system.

After eleven years of tag, ticket and label conferences, IMI participants this year found a vital industry alive and advancing in the digital world. <

Bar codes and scanning get a new life

At one time, the bar code was demonized as the devil's invention. While the world's advanced societies innovate, the global village shrinks and the fear of outsiders controlling one's destiny engenders opposition. Fortunately, the fear of control by an inanimate bar code has abated. The usefulness of accurate information capture is appreciated. Some hospitals initially rejected patient ID bar coded bands as dehumanizing until the trade-off of reliable data proved beneficial.

Expanding beyond the traditional strongholds of manufacturing, transportation, warehousing and retailing bar codes now pervade the huge health care industry. The next new conquest may be the consumer market as scanning convenience appeals to mall shoppers.

Discovery of new uses for bar codes continually reinvigorates a mature industry. Two significant developments impact many existing inventory control systems:

• Adaptation of a wireless system to replace a wired system;

• Integration of an established inventory control procedure to an enterprise resource planning control system (ERP).

Reliable bar code inventory control is a compelling reason for ERP integration. The connecting process, however, can be cumbersome. Bar code printers usually process image based feeds to print quality, readable bar codes. To convert proprietary print drivers to a business system program requires data translation patches -- not an easy process.

There is an interconnection between bar code assimilation into an ERP system and communication protocols that transmit bar code scanned data. In both cases the protocol must accept both image and alphanumeric data streams. A universally accepted protocol such as TCP/IP offers one possible solution.

Responding to new opportunities for bar coding, industry leader **Symbol Technolo-**

gies, Inc., Bohemia, NY has moved rapidly into wireless communication expanding from its wired scanning base. Responding to demand for RFID equipment, Symbol has developed rugged hand held radio scanner units. Among new product offerings which have earned Symbol trade association awards are:

• **Net Vision Data Phone** - combines voice communication, data capture by bar code scanning and radio transceiver into a small hand-held cell phone sized unit.

• **PDT 6100** series - a portable data terminal containing a high performance scan engine which communicates via Symbol's Spectrum 24 radio local area network (LAN).

• **PPT 2700** - A PDA with Microsoft Pocket PC platform coupled to an internal scanner and API useful functions. This computer communicates by Symbol's Spectrum 24 LAN.

• **CB1000 Client Bridge** - Backbone of the Spectrum 24 wireless LAN which enables wired printers and computers to connect to the radio network using TCP/IP protocol. Standardized radio communication protocol meets IEEE standards for short range radio. This is a key building block that can replace a wired systems. (Printers can be connected directly to the bridge creating a wireless network.)

Now that bar codes are ubiquitous and the fear factor has abated, Symbol and others are exploring ways to use this familiar, reliable information source. Experimental kiosks, where one can pick up a scanner to help shop are being beta tested to measure customer interest. With a scanner in hand,a prospective buyer can browse a store's inventory or wander a shopping mall while gathering information and pricing. A favorable customer reaction could expand this new information service beginning a new growth area for the ubiquitous bar code. <

Courtesy of Lyra Research

Chemicals Conference

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news is that hard copy printing continues growing as electronic communication expands. Obsolescence of hard copy printing is not visible in the near future. Printing mechanisms are expand into homes and into third world countries stimulating growth for many printing systems.

A bullish forecast offered the conference chemists a bright future for the supply industry. The number of new patents, the launch of new printing systems, the targeting of new markets, the discovery of new applications were mind-numbing. A near information overload was a common experience at the IMI conference as presenters explained and demonstrated many novel systems.

Mike Willis, Pivotal Resources, Cambridge, England reviewed new printer introductions highlighting those with significant advancements. A breakthrough ink jet page array print mechanism developed by **Xaar plc,** Cambridge, UK will be introduced in 2002. Xaar's solution offers 80 feet per minute ink jet printing across a 9 inch or 12.6 inch page width by using multiple nozzles. OEM printer manufacturers are Xaar's target customers.

Dr. Alan Donaldson, a professor at the **North Carolina University College of Textiles**, Raleigh, NC elaborated on a cationic process that offers a significant improvement on previous ink jet printing of textiles. This new electrostatic process may allow ink jet digital printing of textiles to compete effectively with traditional screen textile printing. The cationic process involves a chemical reaction where cellulose (cotton) textile is modified with positively charged nitrogen molecules. An electrostatic bonding receptor is created that attracts negatively charged dyestuffs. In the printing process, acid dyes normally used to color fibers, are attached to the cellulose molecule.

The IMI conference highlighted supply advancements with presentations on dry toner additives -- dry waxes and resins. Renewed interest in liquid toners for digital printing presses was discussed thoroughly. Advances in dye chemistry and increased use of polymers offer improved properties for dry toner inks and ink jet inks. New ventures in coated paper need cooperation between ink and paper chemists. <

Imaging Chemicals Conference Expands

Orlando, FL - No matter what the printing system, the output is almost always an observable image marked on a substrate. The visible marking requires some form of ink that is sensed by the eye. The interaction between the ink and media is a scientific, ongoing study — constantly changing depending upon the printing system selected, the substrate to be marked and the quality and form of ink employed. Two of the three key elements of a printing system — ink and media — are the province of chemists. Paper and ink chemists are bonding partners engaged in an intellectual struggle to solve the complex interaction of the printing process.

The paper chemist is now media savvy (not limited to paper alone) searching to apply new adhesion techniques to receiver media. It is a complex era where the choice of a printing system has its own variety of machines and printing technologies — far removed from traditional handwriting or impact printing or a printing press.

These advances create a whirlwind of activity which attracted a roomful of chemical specialists to the fringes of Disney World for the **Information Management Institute 4th Annual Toner, Ink Jet Ink & Imaging Chemicals Conference** held in March 2001.

Ray Walsh of **Lyra Research**, Newtonville, MA, offered encouraging worldwide printer sales projections with ink jet technology dominating over 50% of the market. While Walsh's predictions show a leveling of printing growth, the good

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New *Commentary* series on IMI web site

William D. Glover, editor of **Image Printing Digest** has posted two essays describing how major corporation, related to the printing industry, convert an old economy company to success in a new information technology economy . These in-depth articles track current actions by the CEO's and Boards of Directors of **IBM Corporation, Xerox Corporation** and **Pitney Bowes Corporation.**

Glover's first essay: ***IBM and Xerox at the Crossroads***, compares the seven year recovery of IBM under the leadership of **Louis V. Gerstner** with current actions taken at Xerox Corporation. The second essay: ***Pitney Bowes in Transformation***, reviews Pitney Bowes' history and describes recent actions that adapt the company to a changing postage meter environment.

Both Image Printing Digest Commentary articles are posted on the IMI website, *http://imi.maine.com.*

Ink Jet Printing Developers' Conference Debuts

Scottsdale, AZ - **Information Management Institute**'s first marshalling of technical ink jet professionals in a setting free of trade show marketing hype was a significant success. **Al Keene**, president of IMI, opened the conference explaining that, "The high cost of business travel makes this conference format an excellent investment for providers and developers. We encourage all to build relationships, in confidence, through our private meeting sign-up opportunities. Developers are urged to compare offerings, to network with their colleagues and to ask probing questions. Having printer manufacturers, media specialists, ink experts, software specialists gathered together in one place over two-and-a-half days offers an exciting opportunity to begin new projects or to advance current developments."

Among the presenters and exhibitors were: **Hewlett Packard Corporation, Spectra, Inc., Trident International, American Ink Jet Corporation, Flint Ink, Sericol Imaging, SunJet, Xennia Technology, Imaging Technology International, Pivotal Resources** and **VisionJet.**

The success of the initial Ink Jet Printing Developers' Conference resulted in an addition to scheduled 2002 IMI European conferences. From May 15 to 17, 2002, IMI will host a conference with structure similar to the Scottsdale event at the Radisson SAS Hotel Amsterdam Airport in The Netherlands.

Sign up early for

IMI's Year 2002 Conferences and Seminars

Reservations for all 2002 events can be made by telephone 207-235-2225, by fax 207-235-2226, by e-mail imi@somtel.com or by USPS, RR1 Box 2030, Kingfield, ME 04947

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