



The DATA CAPTURE Report

Since 1977, the premier management & marketing newsletter of automatic data capture: Bar Coding, RF and related technologies

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May 24, 1996

PSC Announces Agreement To Purchase Spectra-Physics Scanning Systems

PSC, Inc. Tuesday announced that it has signed a definitive asset and stock purchase agreement with **Spectra-Physics AB of Sweden** to acquire its Data Capture Group, which includes **Spectra-Physics Scanning Systems, Inc.**, TXCOM and related businesses ("**Spectra**") for approximately \$140 million. The transaction is expected to close within 60 days. Spectra, which is headquartered in Eugene, OR, is a leading manufacturer of countertop and in-counter, fixed-position, bar code scanners for retail point-of-sale applications.



L. Michael Hone, president, chairman, and chief executive officer of PSC, stated, "The acquisition of Spectra gives us the broadest line of handheld and fixed-position, laser bar code readers of any manufacturer in the world. As a result, PSC becomes the only company that can address all bar code

reading needs throughout the retail supply chain, from point-of-sale checkout back to the manufacturing floor and to the source of raw materials, throughout the transportation and logistics process.

"The addition of Spectra enables us to expand more quickly into the retail segment, which today accounts for approximately 50% of the bar code market. In addition, Spectra has established international operations in Europe, Latin America and the Pacific Rim, which should help us penetrate these markets with traditional PSC products more quickly."

Commenting on the acquisition, John O'Brien, president of Spectra, stated, "Our business is strong and we anticipate 1996 revenues of approximately \$115 million. Becoming a part of a company that is focused on bar code reading is exciting and should enable us to aggressively pursue new products and emerging opportunities like retail self-checkout systems, wireless RF systems and package sortation systems. Spectra has a strong distribution and premier list of end-users for our products. Both represent strong opportunities for PSC's handheld bar code readers and commercial, fixed-position, scanners."

William J. Woodward, PSC vice president of finance and treasurer, stated, "At closing, the acquisition will be accounted for as a purchase and be funded by a combination of cash and PSC common stock. The cash portion of approximately \$125 million will be financed by a combination of senior and subordinated debt.

"PSC anticipates allocating a significant portion of the purchase price to acquired, in-process research and development as required by generally accepted accounting principals, resulting in a charge to the Company's operations at closing."

PSC manufactures laser-based, handheld and fixed-position, bar code readers, bar code verifiers and automated, carton-dimensioning systems for automated data collection in retail, manufacturing, transportation, distribution, food and health care industries and government. PSC has manufacturing facilities in Rochester, NY, and Orlando, FL.

Spectra-Physics Group is a manufacturer providing electro-optical, measurement instruments, equipment and solutions in order to enhance its customers' efficiency and productivity.

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ID Expo Bids Farewell To Rosemont

by George Goldberg

Whew! That was a close call.

Advanstar's announcement last February, that it was moving its ID Expo Convention to Philadelphia in 1997, came not a moment too soon (SCAN Feb 96). The problem of "two shows in Chicago" each year — ID Expo in the Spring and SCAN-TECH in the Fall — had become a festering sore for the exhibitors. Our conversations with ADC vendors — subsequent to the Advanstar statement — made it apparent that there would have been a very large number of "no-shows" in 1997 if ID Expo had returned to Chicago.

It was with some trepidation, therefore, that the exhibitors and show managers approached what may be ID Expo's final appearance at the Rosemont Convention Center near Chicago's O'Hare Airport. Would Advanstar's decision to leave the Chicago venue to its main competitor — at least for the next few years — dampen the attendance and spirit at this year's show?

Advanstar's decision certainly did not make John Lewinski unhappy. Lewinski is **Reed Exhibition's** new vp in charge of SCAN-TECH. He was quite forthright when we caught up with him at ID Expo, where he was apparently checking out the competition. "Advanstar's decision to move ID Expo to Philadelphia," he said, "strengthens our resolve to stay in Chicago."

Reed recently surveyed its SCAN-TECH exhibitors. Lewinski revealed to SCAN/DCR that the results clearly showed "almost no one supported two shows in the same city — any city." Chicago, however, was still voted the number one choice for SCAN-TECH.

Adding to everyone's concern at ID Expo this year was the defection of many important exhibitors who had been regulars at both shows. Cancellations at ID Expo included many of the major manufacturers of printing equipment: **Zebra, Datamax, Printronix, Sato** and **Avery Dennison**. Among the others that did not participate were such prominent names as **PSC, Compsee, Fujitsu** and **Spectra-Physics**.

Despite these setbacks, the results of the event, in our estimation, were most satisfactory. There were some exhibitor complaints about the apparent drop-off in the number of visitors (based on perceptions of booth activity and the number of people in the aisles). But these negative comments were more than offset by others who felt that the number and "quality" of inquiries they had registered compared favorably to past ID Expo shows.

It was particularly encouraging to see that the ID Expo educational seminars were well attended. According to an Advanstar spokesman, there were more than 600 registrants to these presentations, which exceeded last year's attendance.

Apropos the subject matter offered at these seminars, and the

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- OCR products
- Voice recognition systems
- Vision systems, video scanners
- EDI
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- Biometrics
- Application software
- Peripherals or supplies for the above

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need for new material and new presenters, we asked Dick Meyers about the status of his "Ten Commandments of Bar Coding" lecture which has survived for more than ten years. Meyers — one of the ADC industry's most active consultants and lecturers — has brought his Ten Commandments to tens of thousands of students (including two sessions at this year's ID Expo, attended by more than 160 people) and he thinks it will go on forever. "I always ask my students how many of them are being exposed to ADC technology for the first time and I continue to get a ninety percent response," he explained. "So long as there are people who need to know the basics of bar coding, I will be there."

Among the interesting new products on the convention floor, we thought the "best-in-show" was the **Metanetics** IR-2000 Handheld Image Reader. The IR-2000 is a CCD-array reader/camera that "captures 1-D bar codes, 2-D symbols, photographs, signatures and other graphic elements." The prototype that was demonstrated for us had full autodiscrimination capabilities; i.e., it read and decoded the six most popular linear bar codes plus four 2-D symbologies — PDF 417, DataMatrix, Maxicode and SuperCode — one after the other with no operator adjustment.

This same unit can also "photograph" an image — such as text on a page — and reproduce it digitally. Suggested applications include delivery verification, where both the bar-coded package identification and the identity (signature or photo) of the recipient can be captured; or verifying credit cards or check signatures at the point-of-sale. In a most impressive demonstration of the unit's versatility, a photo was taken of an item fifteen feet away and it was reproduced on screen within a few seconds. The IR-2000 has been tentatively priced at \$1,395; production and shipment are scheduled for the Fall of 1996.

For more information: **Metanetics**, Fort Myers, FL, (941) 939-4415, FX (941) 277-5317, E-mail: ccli@metanetics.com.

In our next issues we will be reviewing other new products and important corporate developments that surfaced in Chicago this past week.

Comment:

We were sorry to bid farewell to Rosemont. We have always found it to be a far superior, more convenient venue than downtown Chicago's McCormick Place.

But we remain fully supportive of Advanstar's decision to bring ADC technology to a greater audience by moving ID Expo to different locations and by expanding its regional ID Info conferences. Advanstar values the support of the vendors and we hope that all of the companies who were conspicuous by their absence this year will return to ID Expo 97 in Philadelphia and beyond.

SCAN

New WLI Forum Bursts Upon The RFDC Scene

by Rick Morgan

As lights flickered and the sounds of exhibitors dismantling booths rang through the rafters of the Rosemont (IL) Convention Center at ID Expo 96, we were still chasing down information on a consortium of manufacturers who have banded together as the WLI (Wireless LAN Interoperability) Forum. The group's charter is to "promote the growth of the wireless LAN (local area network) market through interoperable products and services at all levels of the value chain."

Although formal announcement of the WLI Forum was not to take place until the following Monday (May 20), members of the consortium were very eager to discuss the joint venture. "The RF Data Communication industry has great potential," the members told us repeatedly, "but end-users are putting off their buying decisions because they are afraid of being locked into a proprietary system." The WLIF members maintain that buyers are reluctant to purchase any system that will be incompatible with peripheral products they need in the future.

The Institute of Electrical & Electronic Engineers is currently developing a specification (IEEE 802.11) to regulate RF wireless LANs and deal with the interoperability issue. Because many members have become frustrated with the long delays in completing IEEE 802.11, the Forum has organized to offer interim interoperability to promote purchases of their products.

The idea for the Forum was spawned and has been driven by **Proxim, Inc.**, a public company founded in 1984 to develop and market wireless communications technology. Proxim manufactures the RangeLAN2, 2.4 GHz, frequency-hopping, wireless, LAN product family (which is a backbone or access point for wireless networks). "Our goal is to publish an open interface specification enabling independent parties to develop compatible products and establish a certification process for wireless LAN product interoperability," said Brian Button, vp of marketing for Proxim, and WLI Forum secretary. "The specification sheet will explain what a company needs to do to make its product compatible with those of other companies. Then we will have an independent, outside body or academic institution check to see if the product meets the specifications. If it does, we will issue a certification signifying WLIF approval. We hope to publish the specification sometime during the summer of this year."

The WLIF charter is not intended to conflict with

the IEEE 802.11 objective of developing new interface specifications. As new IEEE standards emerge, including 802.11 in the 2.4 GHz band and other standards in different bands, the WLI Forum plans to incorporate them into its charter activities and to develop a transition path to them from the current RangeLAN2-based interface.

"We wanted to provide immediate solutions to customers, so the slower procedures of 802.11 was not an option," commented Chris Gladwin, chairman of the WLI Forum and Product Strategy Director for Zenith Data Systems. "However, many WLI Forum member companies are heavily involved in the 802.11 committee and have 802.11 development plans. If the current IEEE 802.11 draft proposal evolves into a robust standard, I expect it to become an important part of the Forum's program."

Companies that have already paid the \$6,000 WLIF membership dues are:

- **ALPS Electric (USA)**
- **AMP**
- **Comtron**
- **Data General**
- **Kansai**
- **LXE**
- **Matsushita Inter Techno**
- **Norand**
- **NTT-IT**
- **Proxim**
- **Ratheon**
- **Seiko-Epson**
- **TimeMaster**
- **WiSE Medical Systems**
- **Zenith Data Systems**

President of **Intermec**, Michael Ohanian advised *SCAN/DCR* that he had not heard all the pertinent details but felt his company would likely participate in the Forum.

Almost as notable as the number of companies that have joined the consortium is the absence of two major players in this market, Symbol Technologies and Telxon. Officials at Telxon could not be reached at press time, but Barry Issberner, **Symbol Technologies**, senior director of marketing for mobile & wireless systems division, was very negative in his response to the WLIF initiative. "The Proxim system has been rejected by the IEEE 802.11 committee," he told *SCAN/DCR*. "This Forum is a desperation attempt by Proxim to gain industry approval of their technology. There is no way they [Proxim] are going to give out the schematic for their product so that other companies can design competing products."

Proxim's Brian Button responded: "We are not going to tell other LAN companies how to build products

that compete with ours. However, we will publish a specification that documents the radio frequency (RF) interface allowing independent parties to develop compatible products. Then it is up to the other companies to come up with their own products. We still hope that Symbol and Telxon will join us in our efforts."

Commenting on the Forum's efforts, Craig J. Mathias, a principal with **Farpoint Group**, an advisory and systems integration firm specializing in emerging communications technologies, said: "To my knowledge, this is the first time a wireless LAN vendor has opened up the physical layer of its flagship product. I find this strategy to be reminiscent of that used in building Ethernet's leadership in wired LANs. Perhaps we will see a similar effect here."

Bill Wise, advertising/sales promotion manager for **LXE, Inc.**, summarized the philosophy of WLIF members. "We want to make our technology public domain," he explained. "Interoperability may increase competition but we are confident that we have the products that can compete in an open market."

For more information: **Farpoint Group**, Ashland, MA, PH (508) 881-6467, FX (508) 881-8058, E-Mail: farpoint@ultranet.com - **Intermec**, Everett, WA, PH (206) 348-2607, FX (206) 348-2703, E-mail: info@intermec.com - **LXE Inc.**, Norcross, GA, PH (404) 447-4224, FX (404) 447-4405, E-mail: wjw2138@lxe.com - **Proxim, Inc.**, Mountain View, CA, PH (415) 960-1630, FX (415) 960-1984, E-mail: brian@proxim.com - **Symbol Technologies**, Holtsville, NY, PH (516) 738-4969, FX (516) 738-4164, E-mail: issber@symbol.com - **Zenith Data Systems, Inc.**, Buffalo Grove, IL, PH (847) 808-4497, FX (847) 808-4976, E-mail: c.gladwin@zds.com.

SCAN

Bar Code 'On-Your-Honor' Checkout System Tried By Safeway Superstore Chain

A new bar code-driven data transaction system that allows customers to scan their purchases in the aisle as they place them in their shopping carts, was recently installed in 24 of Safeway's company stores. The system, which Safeway calls "Shop & Go," will be available in another 36 stores by August with eventual plans to roll it out in all 150 superstores in the 369-store chain.

The product was introduced by **Symbol Technologies, Inc.**, and is formally titled the Symbol Personal Shopping System. Upon entering a

store, the shopper uses a Scan & Go card to remove a designated Portable Personal Shopper device — about the size of a telephone handset — from an automatic dispenser rack. The lightweight scanner is equipped with three keys — “plus,” “minus,” and “equals” — as well as a small visual display.

As the shopper selects merchandise, he or she scans each item's bar code using the “plus” key and places the item in a cart. If a shopper decides against purchasing an item, it may be canceled by using the “minus” button to scan the bar code; its price is subtracted from the shopping total. The shopper can obtain a subtotal of purchases by pressing the “equals” key at any time.


When shopping is complete, the scanner is returned to the rack and the transaction is completed with the printing of a bar coded ticket. The shopper advances to an express checkstand for payment.



SCAN/DCR talked to Alison MacFarren, media relations executive for **Safeway** (United Kingdom), and asked how the new “honor” system was working out. “Things are going very well. Our customers really like the speed and convenience of this type of shopping,” said MacFarren.

“To use the system, a customer must apply for a ‘Shop & Go’ card so we have a screening system of sorts. And, we do random checks at each store. In these spot-checks, we ask the customer to run their purchases through the normal checkout procedure. Customers know in advance that they may be periodically asked to cooperate with these random checks, so we have encountered few complaints.”

Each store requires as many as 200 scanners. With a total of 150 stores, that's 30,000 scanners. SCAN/DCR will continue to monitor this application and report on its successes and failures.

For more information: **Symbol Technologies**, Holtsville, NY, PH (516) 738-419, FX (516) 738-4740, E-mail: tully@symbol.com. 

More On Ultracode

by Bert Moore

“Multi-color bar codes? The last time I heard of that was the old rail car tracking system....” “Aren't there something like 30 two-dimensional symbologies already?” “What's this ‘multiple Octet’ encodation?” “Stencil printing...!”

The article on **Zebra Technologies'** new Ultracode™ “linear matrix” symbology (SCAN/DCR 5/10/96) prompted these skeptical comments — and readers wanted more information.

Dr. Clive Hohberger, Zebra's vp of technology development, invented Ultracode. “Ultracode incorporates the best features of both linear and matrix symbologies,” he told SCAN/DCR. “It is linear in the sense that it is constant height, with the length dependent on the amount of data encoded. It uses columns of pixels [like a matrix symbology] but is not intended to compete with high capacity 2-D symbologies. Ultracode is intended for relatively limited amounts of data.”

According to Hohberger, Ultracode was designed for applications where:

- * a linear bar code symbol would normally be used,
- * multiple symbols will be added during a process (e.g., manufacturing),
- * printing will be directly onto a difficult substrate (e.g., stencil on a wooden crate),
- * available printing methods are less than state-of-the-art,
- * error correction may be required, and/or
- * efficient encodation of non-Roman alphabets (e.g., Cyrillic) or pictographic languages (e.g., Chinese) is required.

When asked whether it isn't a little strange for a company that specializes in high quality bar code printers to develop a symbology intended for, among other things, spray can and stencil marking, Hohberger laughs. “Sure,” he says, “but if you can eliminate most of the printing tolerances of linear bar codes, the result is a symbology that lends itself very nicely to high quality, very high density printing on a conventional label.

“Also, Zebra does business in over 70 countries around the world, and one-fourth of the world's

population use ideographic or pictographic languages. We wanted to better serve their language needs."

Here's how Hohberger met these objectives:

Fault tolerance: Ultracode uses only single-width pixel column elements. These require only placement precision in printing. The X-dimension (width) of each column is not critical. This provides some of the fault-tolerance Hohberger sought. Reed-Solomon error correction provides another piece.

Encodation: Data is encoded in column pairs of 6 pixels per column. One column pair can encode any alphabetic character in any language; three pairs are required for a Chinese character.

Ultracode implements ISO 10646-1 (1993) "Universal Multiple Octet Coded Character Set Specification." Languages are grouped by families into "code planes" of 32 sets of 32 characters each. This method uses 16-bit character encodation, rather than the usual 7 or 8 bits, and provides very efficient switching between code sets and planes.

Density: Ultracode needs 2 columns (or 2X) per alphabetic character versus 13-16X for Code 39. For all-numeric data, Ultracode needs 4X for two digits, Code 128 Code Set C requires 11X.

Ultracode's overhead, including 3X quiet zones, is 24X. User-selectable error correction adds to overall symbol size but Ultracode is still very compact by any measure.

Capacity: Ultracode is arranged in "frames" of 12 columns each, split between data and error correction characters. A maximum of 35 frames can be used in a single symbol. That translates into 175 alphanumeric, or 58 ideographic, characters with 17 percent error correction.

Concatenation: Up to 18 Ultracode symbols can be concatenated — without knowing the final number of symbols. Symbols are applied as needed to

accumulate data during a process. Every symbol contains a reference to its order in the string. The last symbol in the string is uniquely identified.

Reading: Ultracode is designed to be read by any device capable of capturing a bit-mapped image. Two-dimensional CCDs are the readers of choice but rastering lasers and sweep-scanned linear CCD readers can also be used.

Color Printing: The introduction of color to increase density is one of the unique features of Ultracode. Instead of increasing density by increasing possible encodation patterns, color printing superimposes a mirror-image of the right half of the symbol onto the left half of the symbol (essentially, "folding" it in half).

Imagine that magenta and yellow are substituted for black and white on the left side of the symbol, and cyan and yellow are used on the right. The result is a red-green-blue-yellow symbol that can be separated into the original pixel colors by a subtractive color process (e.g., red pixels are separated into magenta and yellow pixels). Specially designed readers, using a color video camera, will be required for this feature.

You really have to see it to believe it.

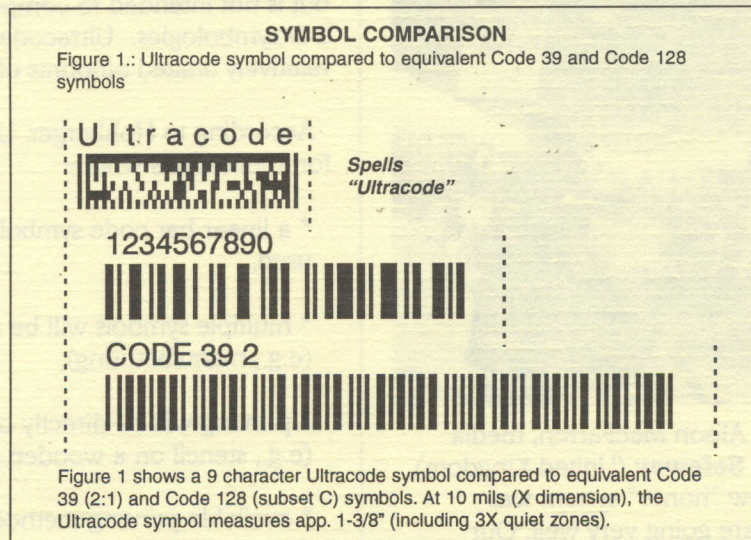
Development: According to

Hohberger, Ultracode is still being refined. He has met with linguists as well as bar code and MIS experts in Western Europe, Russia, Korea, Japan, Taiwan, China, and the U.S. Discussions centered on whether the symbology would actually meet local language needs, whether it's technically sound, and whether there's an interest in it. Feedback has reportedly been very positive in all areas.

Hohberger anticipates finalizing the specification and submitting it to AIM International by spring 1997.

Applications: Although an obvious application is for direct marking on rough or porous substrates, Hohberger cited a number of other applications:

* for the health industry as a possible solution to



unit dose marking, particularly on non-absorbing materials.

* for use by postal authorities because, like Postnet, it's easy to print with virtually any technology.

* for document tracking, Ultracode has been suggested because it is much more condensed than linear symbologies, and color ink jet printers are readily available for color Ultracode.

* for electronic document storage and retrieval — in applications where electronically-generated or scanned documents include bar code symbols — Ultracode's distortion-resistance avoids unreadable symbols if the document is printed at a different size or dot density than the original.

Comment: *The need for an inexpensive, fault-tolerant, machine-readable technology that encompasses all natural languages is clearly growing. Expecting the average factory worker in, say, China to be able to interpret "ABC-123" is as realistic as expecting the average US factory worker to interpret "x00`b¢.*

There's bound to be arguments about whether Ultracode is a linear, a linear-matrix, or a true 2-D symbology since much of Ultracode's fault tolerance is shared by all matrix symbologies. However, as Hohberger points out, one of Ultracode's primary design criteria was to meet the language requirements of a large part of the world's population. Whether Ultracode meets these needs as a linear, linear-matrix, or matrix symbology is less relevant than the fact that it represents the first serious attempt to do so.

Whatever the outcome of Ultracode, Hohberger's work will be seen as a landmark in the development of all subsequent symbologies and should serve as a "wake-up call" to those selecting encodation methods for all other technologies as well.

What Does "ISS" Mean To You?

by Bert Moore

Time to update your glossaries again.

Even those familiar with bar code specifications probably don't recognize the acronym "ISS." Many folks are probably more familiar with "USSs," or "Uniform Symbology Specifications" issued by AIM USA.

AIM USA (the North American trade association for suppliers of ADC equipment, services, and

supplies) has been issuing the definitive symbology specifications for everything except U.P.C. since the mid-70s. The globalization of standards, however, spell the demise of national specifications such as USSs.

Enter AIM International, Inc. (AIMI). AIMI is the umbrella organization that ties together the more than 25 AIM organizations around the world. AIM organizations are acknowledged as the authorities on symbology issues (since its members invent the majority of them).

Under a recently-approved plan, all new symbology specifications will be submitted to AIMI (rather than national AIM affiliates) for development as international standards from the very beginning. The designation "ISS (International Symbology Specification)" was chosen to differentiate these new specifications from national ones.

It's anticipated that ISSs will provide internationally-recognized source documents for adoption by national and international authorities.

Correction:

In the 5/10/96 issue, reference was made to CCITT (Common Commission for International Telephone and Telegraph) as an international standards-setting body. CCITT is the old name of the organization. The correct name is ITI (International Telecommunications Institute).

SCAN

Vendors Speak Out On "Top Three Challenges" To Reaching Goals

What are the immediate challenges confronting the major North American vendors of bar code equipment? Does the forecast of substantial, continued growth in global revenues — 20% per year in 1996 and 1997, by some estimates — suggest that everyone can look forward to banner years?

The **Venture Development Corporation** recently posed these questions to more than 60 global vendors of bar code equipment. Vendors cited the following dilemmas as hurdles for reaching 1996 and 1997 revenue and profitability goals:

- Choosing markets, applications and accounts with the greatest potential for profit. Almost all of the respondents (95%) recognized this as a

problem. The big challenge is to not only choose a market that offers the best potential for profit, but also to develop new products which are close to the company's field of expertise.

- A clear majority (85%) believe it is difficult to get industry leaders to agree on bar code standards because they fear they will lose their proprietary "edge." To be commercially viable, most leaders say standards must be "living." That is, the standard must be 80% firm and 20% adaptable to a company's proprietary products and solutions. Competitiveness within the industry fuels debate over what is public and what is proprietary with respect to codes.

- Striking a cost-effective balance between using indirect channels and direct customer contact for sales was troublesome to 80% of the vendors surveyed. Most company leaders felt indirect channels (VARs, distributors, systems integrators, etc.) offered a more cost-effective way to get their products to market. This is because channel companies are responsible for sales, service, and installations. However, participants in the survey felt indirect channels caused them to lose valuable product feedback obtained by selling directly to end-users.

Vendors cited expertise in the following business practices as "key requirements for success" in meeting revenue and profit goals for 1996 and 1997:

- Seventy-five percent cited "cannibalism", or the

process of lowering the price and improving the performance of current products internally, before competitors beat you to it. When a company is the acknowledged industry leader with respect to a particular product, it can often fend off competition by beating them to the punch on price and product performance improvements.

- "Bridge building" was extremely important to 70% of the respondents. This really boils down to the key word "compatibility." Vendors must develop products that will be compatible with other products in the industry. The ultimate goals are to get rid of proprietary hardware and secondly, to develop software that will allow users to easily link different technologies.

- "Selective market expansion" was critically important to 70% of those interviewed. The key elements of this function are: deciding on the products to be offered; picking markets and applications that fit well with the current direction of the business; and selecting a method of distribution, i.e., channel or direct marketing.

A more detailed discussion of these issues and others can be found in VDC's 1996 North America Bar Code Industry Planning Service.

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