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Bar Code Détente: U.S. Finally Adds One More Digit

By STEVE LOHR

The humble bar code, the rectangular thicket of slender bars and spaces on products, ignored by shoppers, indecipherable to humans, is joining the forced march of globalization.

For American retailers, whose checkout-line bar-code scanners will be expected to read the global bar-code standard by Jan. 1, the required changes in computer systems and software programs has echoes of the Y2K computer problem.

In the not-so-subtle tug-of-war of trade rules and technology standards, the globalization of the bar code represents a small erosion of American industrial hegemony.

Europe won this one. The global bar code standard will be the European Article Numbering Code. It turns out that the American Universal Product Code - which turned 30 years old last month - was never so universal after all.

The difference between the American and the European bar code standards, as it so often is in computing, is a matter of digits. When the Europeans set up their bar code in 1977, patterned after the American standard, they reasonably decided that they needed extra digital space for more products and identifying countries. (There were 12 nations in the European Community at the time.)

So the European code has 13 digits, while the code used in the United States and Canada has 12. The 13-digit code took off and is used in most other countries. And the American side has finally made an accommodation with reality. The Uniform Code Council, the North American arbiter of bar codes, has told North American retailers that bar-code scanners will have to read the 13-digit codes by January. The 12-digit codes do not die; systems that can read 13-digit codes can also read 12-digit codes.

"But the 13-digit standard is what it's all moving to," said Ray Tromba, an expert in retail and consumer products distribution for [IBM Global Services](#). "The 13-digit is the global standard."

The bar code's globalization is a sign of its triumph over the years. As the identifying code of modern commerce, it has made possible everything from faster checkout service to sophisticated market research. More than five billion bar-coded products worldwide are scanned every day.

When the bar code arrived three decades ago, the computer revolution was beginning in earnest. Low-cost, powerful computing and vast databases, experts say, helped reduce labor costs, change the relations between manufacturers and retailers and hasten the rise of efficient mass-merchandisers like [Wal-Mart](#) - and the bar code was central to that revolution.

"The bar code opened a gold mine of data," said Janice H. Hammond, a professor at the Harvard business school. "Without the bar code, it would be a whole different ballgame in retailing than it is today."

The bar code's story is a striking example of how new technologies become adopted, and perhaps holds some lessons.

The successful spread of the bar code may seem inevitable, but only in retrospect. Even after its commercial introduction on June 26, 1974, when a pack of Wrigley's Juicy Fruit gum was scanned at a grocery store in Ohio, there were rocky years.

Consumer groups protested the bar code, saying that shoppers would be cheated if price tags were not on each item. Labor unions decried the possibility of job losses from the labor-saving technology. There were environmental worries that the laser scanners in the bar-code readers might damage people's eyes.

By 1976, the initial wave of enthusiasm had faded when BusinessWeek magazine ran an article headlined, "The Supermarket Scanner That Failed." Predictions that 1,000 or more grocery stores would have installed bar-code scanning systems by 1976 proved wildly optimistic. Only about 50 stores in the United States had them, BusinessWeek reported, and bar-code equipment makers, including RCA, Pitney-Bowes, Singer and Bunker Ramo, had fled the field.

In the early years, it took a pioneering spirit and a leap of faith for a company to put in scanning systems. The first was a Marsh Supermarket in Troy, Ohio.

"We've always been innovative and tried to be on the leading edge of technology, but that first store wasn't easy," recalled Don E. Marsh, the 66-year-old chief executive of [Marsh Supermarkets](#), a regional chain with stores in Ohio and Indiana.

A faster, more efficient checkout process and instantaneous inventory and sales data were significant benefits. But in the early years, manufacturers did not routinely put bar codes on products, so the stores had to print bar codes and put them on the products. That meant about 200,000 products a week had to be labeled at the Troy supermarket, adding to labor costs.

"You don't get an immediate return for some investments," Mr. Marsh explained, "but we did see the potential of the technology."

Claude Fenstermaker, the current manager of the Troy supermarket, was a 21-year-old assistant manager at the time. "When it started, I didn't have a clue where the technology was headed," Mr. Fenstermaker said. "Today, I don't know how we would get by without it."

Though it took retailers with vision to deploy the bar code in the 1970's, the idea for the technology actually goes back to the late 1940's. Two graduate students at Drexel University, Norman Joseph Woodland and Bernard Silver, first thought of using Morse code, printed out vertically. They later switched to the bars-and-spaces format, and they filed for a patent in 1949, which was issued in 1952.

The technology languished until August 1970, when a meeting of chief executives of major retailers and food manufacturers like A&P, Kroger, Winn-Dixie, [General Mills](#), General Foods and H. G. Hines convened at the O'Hare Inn, near the Chicago airport to decide whether to move forward with the technology.

It was a "last gasp" effort to chart a compromise between the retailers and manufacturers, said Stephen A. Brown, former legal counsel to the Grocery Manufacturers of America, who was at the meeting.

"Everyone knew the technology was there, but it took the involvement of the top management of the end users of the technology to really push the standard," said Mr. Brown, author of "Revolution at the Checkout Counter: The Explosion of the Bar Code."

Eventually, in April 1973, a linear bar code, mainly developed by Mr. Woodland, who was then working for I.B.M., was adopted. The Universal Product Code, as it is called, is a string of digits - one group to identify the manufacturer, another group to identify the product, and one "check digit" for automated error-checking.

"The genius of the standard was its simplicity," said Tom Brady, a former NCR engineer who helped install the first scanners in Troy, Ohio. "It is a simple ID that triggers all the electronic data that is now so necessary to modern automated commerce."

The technology's standards bodies are becoming a single global group as well. EAN International, based in Brussels, and the Uniform Code Council, based in Lawrenceville, N.J., will be folded into one organization, called GS1, next year. The global headquarters will be in Brussels.

For American retailers, conforming to the 13-digit standard requires retooling software programs. "We're well along," said John Metzger, chief information officer of A&P. The grocery chain, with 630 stores, has handled the problem as part of a modernization of its technology systems. "It is important," Mr. Metzger said, "but it is not a shut-the-company-down kind of issue."

But are the days of the simple bar code numbered now that new-generation radio frequency identification tags, which can transmit far more data, are arriving on the scene? The expert view is that the two technologies will live together for a long

time.

"If I walk into a supermarket 20 years from now and there's a box of cereal without a bar code on it," declared Alan Melling, a senior director of [Symbol Technologies](#), which makes both bar code and radio tag readers, "I'll eat it without opening the box."

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