

BAR CODES

(A Retailers Dream Come True)

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Before the invention of barcodes, large retail chains and supermarkets were faced with a problem on how to keep a record of their various product sales and also to improve and speed up their checkout system. Long before bar codes became a reality, the only way merchants had to find out what they had in stock was to shut down the place and count every item. This was not only time-consuming but there was no business being conducted while a record of stock was taken.

What is a Barcode?

A barcode, also called bar code, is a machine-readable representation of information in a visual format on a surface. Originally barcodes stored data in the widths and spacing of printed parallel lines, but today they also come in patterns of dots, concentric circles, and hidden within images. Barcodes can be read by optical scanners called barcode readers or scanned from an image by special software. Barcodes are widely used to identify and data capture systems that improve the speed and accuracy of computer data entry.

Early Development

Two students at Drexel Institute of Technology, Bernard Silver and Norman Joseph Woodland developed the first barcode in 1948. They filed for a U.S. patent in October 1949 and it was granted in 1952. It was not until 1966 that barcodes were put to commercial use and they were not commercially successful until the 1980s because inexpensive code-reading equipment had still to be invented.

Since their invention in the 20th century, barcodes - especially the Universal Product Code (UPC) have slowly become an essential part of modern civilization. Their use is widespread, and the technology behind barcodes is constantly improving. Some modern applications of barcodes include:

- Practically every item purchased from a grocery store, department store, and mass merchandiser has a barcode on it. This greatly helps to keeping a record of the large number of items in a store and also reduces instances of shoplifting.
- Since the adoption of barcodes, both consumers and retailers have profited from the savings generated.

- Rental car companies keep track of their cars by means of barcodes on the cars glass or bumper.
- Airlines keep a record of passenger luggage with barcodes, reducing the chance of loss.
- Researchers have placed tiny barcodes on individual bees to track the insects' mating habits.
- The movement of nuclear waste can be tracked easily with a bar-code inventory system.

The Universal Product Code (UPC)

The best-known and most widespread use of barcodes has been on consumer products. The Universal Product Code, or UPC, is unique because it was developed by the user community. Many technological innovations are first invented and then a need is found for the invention. The UPC is a response to a business need first identified by the US grocery industry in the early 1970s.

Believing that automating the grocery checkout process could reduce labor costs, improve inventory control, speed up the process, and improve customer service, six industry associations, representing both product manufacturers and supermarkets, created an industry wide committee of industry leaders. Their two-year effort resulted in the announcement of the Universal Product Barcode symbol on April 1, 1973. The UPC made its first commercial appearance in Marsh's Supermarket in Troy, Ohio in June 1974.

Economic studies conducted for the grocery industry committee projected over \$40 million in savings to the industry from scanning by the mid-1970s. The usefulness of the barcode required the adoption of expensive scanners by a critical mass of retailers while manufacturers simultaneously adopted barcode labels.

Bar Code Guidelines

The bar codes requirements were as follows:

- To make life easier for the cashier, not harder.
- They would have to be readable at almost any angle and at a wide range of distances.
- The code labels would be cheap and east to print.
- They would have to pay for themselves in two and a half years.

A 1970 study predicted that industry would save \$159 million dollars per year by using the bar code system.

Bar Core Identification System

Developing a standard code was essential for the system to work properly and it was finally agreed upon to accept the Universal Product Code (UPC) as the standard everyone could accept. The code was split into two halves of six digits each; it consists of:

- The first digit is always a zero, except for meat and produce that have variable weights.
- The next five digits are the manufacturers code.
- The next five are the product code.
- The last digit is the check digit to verify the other digits have been scanned properly.

Bar Code Readers

The early bar code scanners were costly and bulky and few were able to afford them. It was not until two technological developments, cheap laser scanners and the integrated circuits, made them easy and affordable for almost all merchants.

Spread of Bar Codes

Bar codes today have spread into many industries and organizations across the world. The UPC code has been redeveloped to suit specific needs of f industry and businesses. The European Article Numbering system (EAN), developed by Joe Woodland, has an extra pair of digits and is quickly becoming the world's most widely-used system.