

The Barcode & Beyond



History of the Barcode (So Far)

Decades of trial-and-error culminated in the debut of the UPC barcode in the mid-1970s. But the barcode quickly struggled; consumers were suspicious and brands and retailers were slow to invest. Eventually the industry got on board, and retailers realized it could help them efficiently scale selling and tracking of merchandise.

The barcode's success soon spread overseas, enabling U.S. retailers to work with foreign manufacturers and subsequently offer shoppers lower prices. But, it had limitations, delivering minimal data and marring product packaging.

Opportunity knocked. In 1995, an Oregon 'Mad Scientist,' Geoff Rhoads, invented the foundation for an advanced barcode – which would enable the age of “connected packaging.”



SCAN PAGE



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(CHAPTER TWO)

It's Destiny: The Barcode & E-Commerce

Like the barcode's rise, the internet developed with little fanfare for decades, serving mostly military and academic needs. America Online, an early consumer internet service, debuted in 1995, and online shopping wasn't far behind. **It elevated the importance of barcodes to global commerce and forever expanded their functionality.** In time, the two technologies would meet up and transform retail.

A Phone 'Talks' to the Internet?

The first mobile phone with internet connectivity (Nokia 9000) was launched in Finland in 1996.



Convenience Hits Home

In the mid-1990s, it wasn't necessarily safe or convenient yet to shop online. This began to change with the rise of Amazon.com.

The now-famous online retailer initially sold books, and soon, an ever-growing cornucopia of products. Not only did **shoppers get a taste for greater convenience and choice**, but now retailers needed to consider inventories beyond what brick-and-mortar stores could offer.

Shopping Magic!

In 1994, The Financial Post (Canada) described e-commerce as a "tele-shopping magical experience."



Barcodes Get Even Busier

E-commerce greatly expanded the consumer goods playing field, but it also presented retailers with significant challenges.

They now had to track more products, across more regions, in warehouses and distribution centers everywhere. The good news? **The barcode was well suited for such complex inventory logistics.**

Today, an estimated 5 billion barcodes are scanned every day – an impossible manual task.

BARCODE WORLDWIDE CONTROL CENTER



NEWS

Hot or Not?

In 1994, USA Today wrote that microbrews, casinos and “on-line” shopping were in, while things like faxes, TV shopping and theme parks, were out.

A New Code in Town

Businesses now needed codes to do more. The QR (Quick Response) code was invented in Japan in 1994 because it could hold more data.

A decade later, companies in Japan unlocked QR codes' marketing potential by inserting a URL into the code and placing QR codes on packaging, posters and signage. With an enabled mobile app, **consumers could scan codes to get online content** – the concept of connected packaging was born.



Wanted: Manufacturing Code

The QR Code's square-mark pattern was originally designed to work in high-speed manufacturing environments.



Going Beyond the Ink

QR codes were an advancement, but they were static and visually unappealing. Rhoads, the scientist, saw the potential to do more. His technological innovations served as the basis for the world's first “invisible” barcode, Digimarc Barcode, introduced in 2010.

This new code carried more data than the UPC and delivered dynamic, digital content that the QR code could not. In addition, it was unobtrusive with little visual impact on packaging. Today it is the only barcode that can be “heard,” but not seen.

Show Me the Money

Before retailers and brands utilized Rhoads' technology, Digimarc began working with a consortium of leading central banks to develop a global system to deter the use of personal devices to create unauthorized digital copies of banknotes.



Connected Packaging Shines

The demand for a better barcode continued when Snapchat introduced Snapcodes in 2015, the familiar “ghost icon,” which is essentially a designer QR code. The trend continued, when Johnnie Walker added NFC (Near Field Communications) tags to its Blue Label scotch, allowing consumers to interact with the bottle to access brand content.

Digimarc Barcode, like the UPC, faced challenges. But **the direction of barcodes, modern packaging and auto-identification came into focus**, when supermarket chain Wegmans (\$8.3 billion in annual sales) became the first retailer to add Digimarc Barcode to its private brand products.

Gettin' the Global Mod

Adding to the 2015 momentum, GS1, the global standards organization, announced in January 2016 it was working with Digimarc to promote and bring GS1 members access to Digimarc Barcode software and services.



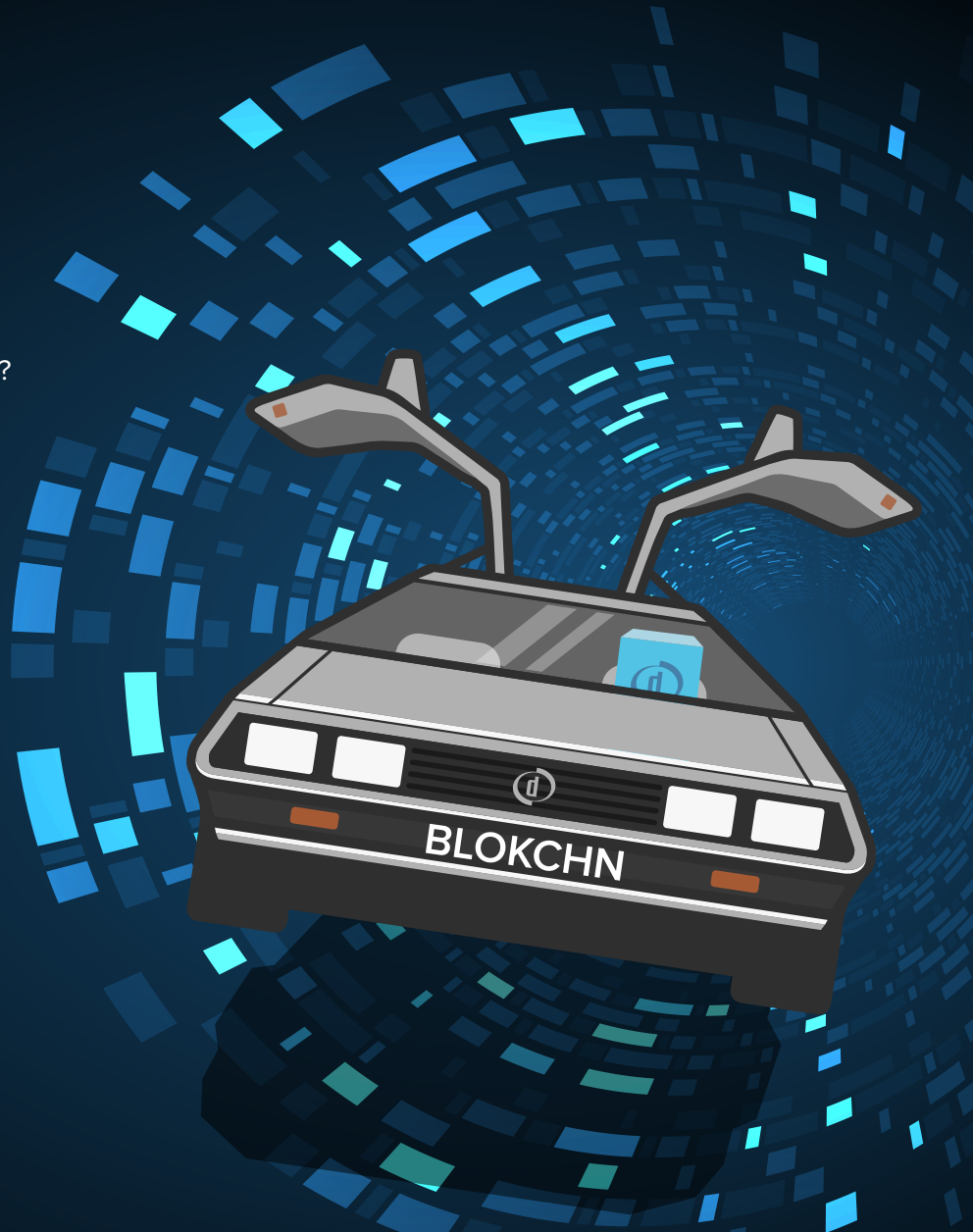
The Future of the Barcode

The UPC is now over four decades old. Digimarc has been offering Digimarc Barcode as a retail solution for seven years. So how will technology continue to impact the barcode and its role in retail?

Some experts are betting on blockchain. Blockchain's distributed ledger technology has value for tracking products and sharing data throughout the supply chain. It has the potential to add an important aspect of traceability to the foods we eat. **A package with Digimarc Barcode could communicate its unique digital ID to a blockchain, allowing complete transparency (to retailers, brands, government, and consumers) to a product's location.**

The End of Visual Symbolgies?

We now have an imperceptible barcode that carries the same data as common retail barcodes and is easily read by phones, scanners and supply chain cameras—does this spell the end of a visual barcode? Only the future will tell.



A Universe Waiting for Discovery

The history of the barcode began in the 1940s and culminated in the UPC's much-heralded debut in 1974. The barcode witnessed the rise of mass merchandisers and the growth of e-commerce, and along the way, connected packaging and Digimarc Barcode.

The story of the barcode in the decades to come won't be about codes, as much as discovery through technology.

The humble barcode will be busy, essential as always, but probably less visible than its UPC grandparent. Not seeing will be believing.



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ABOUT DIGIMARC CORPORATION

Digimarc Corporation (NASDAQ: DMRC) is a pioneer in the automatic identification of everyday objects such as product packaging and virtually any media, including print, images, and audio. Based on the Intuitive Computing Platform (ICP™), Digimarc provides innovative and comprehensive automatic recognition technologies to simplify search, and transform information discovery through unparalleled reliability, efficiency and security. Digimarc has a global patent portfolio, which includes over 1,100 granted and pending patents. These innovations include state-of-the-art identification technology, Digimarc Barcode, as well as Digimarc Discover® software for barcode scanning, and more. Digimarc is based in Beaverton, Oregon, with technologies deployed by major retailers and consumer brands, central banks, U.S. states, film companies and professional sports franchises, among others. Visit digimarc.com and follow us @[@digimarc](https://twitter.com/digimarc) to learn more about The Barcode of Everything™.

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