

# CSCMP hottopics

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## Why The Barcode Has to Evolve

*By Melanie Nuce, Senior Vice President, Corporate Development, GSI US*

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Prior to the pandemic, it was already becoming clear that retail stakeholders needed to evolve their systems and tools to better serve consumers who wanted to feel in control of their path to purchase. The need is only growing as the effects of COVID-19 impact shopper behavior, preferences and lifestyles. The bottom line—consumers expect to be able to access real time information about the products they buy and brands that don't deliver are deemed untrustworthy or tone-deaf to the times we are currently living in.

The availability of product information is key, but moreover, the way product information is accessed is important to consumers too. Consumers do not want to hunt down critical information that supports their purchasing decisions, and they are increasingly receptive to offers and other useful information being presented to them. With the scan of a two-dimensional barcode such as a QR code with their smartphones, this hunt has become instantaneous, but multiple codes on packaging can confuse consumers or desensitize them to their value. The time has come to rethink the role of the U.P.C. barcode, and help industry adopt more robust data carriers that support the complex data needs of today's retail environment.

Early last year, a research paper conducted by GSI US in partnership with VDC Research, called "Powering the Future of Retail: Building on the Foundation of the U.P.C. Barcode," indicated an approaching new era of scannable product packaging. The study found that 82% of retailers and 92% of brand owners support transitioning from the U.P.C. to a data-rich two-dimensional barcode (such as a QR Code or GSI DataMatrix). The industry's goal is to transition to the new codes by 2027, with a temporary period where two codes may exist on product packaging while scanner technology is effectively migrated as well.

Here are more details of this major transition, illustrating why and how the barcode will change.

### ENABLING PRODUCT DIGITIZATION

The study showed that an advanced data carrier is needed to evolve along with consumer demands and provide them with an elevated level of transparency. The ratification of a new standard called GSI Digital Link in 2018 marked a key step to providing consumers with a direct link to trustworthy product information by connecting physical products with their digital identities. Using GSI Digital Link, a product's Global Trade Item Number (GTIN)—the unique identification number assigned to each product and the key to its overall identity in the physical and digital worlds—can be embedded into a specific web address for the product, creating a Web-enabled barcode.



Redirects to a web address

<https://dalgiardino.com/01/09506000134369/10/123456/21/192837?17=191031>

↑  
The protocol (i.e., secure HTTP)

↑  
A domain chosen by the brand or service provider

↑  
The GTIN identifying a product

↑  
The batch/lot number

↑  
The serial number (identifying an item or thing)

↑  
The expiration date

An example of a GSI Digital Link URI syntax, including GSI identifiers.

Two-dimensional barcodes enable dynamic information to be served up through product packaging depending on where the product is being scanned, who is scanning it, and the context in which it is being scanned.

It is part of a system of emerging digital solutions designed to seamlessly connect consumers to more trustworthy product information, images, and video while simultaneously creating more automation where it is needed. As consumers start to view the package as an information portal, brands will have nearly unlimited engagement opportunities. They can combine this tool with collected data such as purchase histories and other analytics to push promotional offers, insights into the product's origins, recipes, and other information directly to those who want it or need it.

### STATIC VS. DYNAMIC DATA

The U.P.C. provides static data. Most of the data typically associated with it remain the same across all individual units of a specific trade item. Additional static data such as the ingredient list and net weight can be printed on the package or stored in master data and shared between supply chain partners today.

But this static approach leaves much to be desired from both the perspective of both the consumer and trading partners. Two-dimensional barcodes enable dynamic information to be served up through product packaging depending on where the product is being scanned, who is scanning it, and the context in which it is being scanned. Dynamic data, such as a product's batch/lot number, expiration date, or serial number, can vary across instances of the trade item and has typically been printed on the packaging alongside barcodes. Making this information part of the single scan of one code will be useful for both consumer engagement and backend supply chain processes. For example, a lot number on an automobile part can be linked to the production date, manufacturing location, and even a specific production line, which is useful for supply chain efficiency and component tracking. The serial number on a seafood item could be linked to information about the location and ship where it was caught, which is useful for consumer engagement. This data can be used for B2B purposes, facilitating traceability or targeted product recalls, or play a role in supply chain transparency to gain consumer trust.

### STATIC VS. DYNAMIC

	Static	Dynamic
<b>Data</b>	Data that is constant across all instances (individual units) of the trade item: <ul style="list-style-type: none"> <li>• GTIN, ingredients list, nutrition facts</li> </ul>	Data that can vary among instances of a trade item: <ul style="list-style-type: none"> <li>• Batch/lot number</li> <li>• Serial number</li> <li>• Expiration date</li> </ul>
<b>Printing</b>	Consistent across the GTIN and other preprinted: <ul style="list-style-type: none"> <li>• Nutrition facts panel</li> <li>• UPC-A</li> <li>• 2D barcoding encoding only the GTIN</li> </ul>	Printing applied at the time of manufacturing and can vary from package to package: <ul style="list-style-type: none"> <li>• Best before date</li> <li>• Batch/lot number</li> <li>• 2D barcode encoding GTIN + attribute data</li> </ul>
<b>Web Links</b>	Link that is the same across a GTIN: <ul style="list-style-type: none"> <li>• Product information URL</li> <li>• SmartLabel® URL</li> </ul>	Link that changes depending on dynamic data: <ul style="list-style-type: none"> <li>• Traceability web page URL for product based on batch/lot number</li> </ul>

### THE EVOLUTION OF THE POS

“Powering the Future of Retail” also revealed an expansion of non-traditional POS channels. Checking out a product has long been centered around cashiers scanning products on fixed-lane POS systems. As consumer demand and retail strategies have evolved, many retailers are expanding their POS options to include mobile checkout, self-checkout, and buy online/pick-up in store (BOPIS). This means that barcodes are more often scanned by handheld scanners and mobile devices, not just traditional scanners.

The global pandemic has also caused consumer behavior to seismically shift and the demand for more self-checkout and contactless options are pulling forward digital transformation by 3-5 years. Increasingly, barcodes are not always scanned by a store employee, but by the customer, either at a self-checkout terminal or with their mobile device. Use cases, data carrier selection, and placement on packaging all must take this expansion of POS environments into account. While this presents challenges, it also creates opportunities as consumers learn to interact more with the data carriers on products.



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As data carriers evolve, the scanner settings and equipment will need to be updated accordingly. The research showed that while an estimated 68.5% of retailers use laser scanners incapable of reading a 2D barcode, 84% were evaluating or plan to migrate to advanced optical POS scanning technology. Also, 60% of tier 1 retailers (\$1B+ revenue) were starting to update their entire POS infrastructure.

## NEXT STEPS

After a long history as the backbone of commerce, the U.P.C. barcode is not going away overnight and will continue to scan at POS after 2027. Brand owners will simply be able to choose between using a U.P.C. or a two-dimensional barcode at that time. In preparation for the 2027 goal, retailers and brands should discuss use cases and data requirements now with trading partners and consider piloting the technology to uncover any gaps in their supply chain or other critical lessons to be addressed over time. To give consumers information about the products they buy and provide additional data that can be leveraged by the supply chain instantaneously, now is the time to prepare for migration beyond the U.P.C.