2D in Retail:
A new dimension in barcodes

September 2021

To better enable the digital consumer, the retail industry is embarking on one of the biggest changes since the original introduction of the barcode – adoption of 2D barcodes. This journey will dramatically enhance the experiences of consumers, brands, retailers and everyone in between. GS1 is supporting industry around the world to harness the power of these barcodes and symbols to enable new business solutions for today….and into the future.

Why evolve to 2D now?

Current 1D barcodes are limited in their ability to meet new consumer requirements. 2D codes, which include QR Code and Data Matrix, are already appearing on product packages in addition to EAN/UPC barcodes…yet today these codes are often put on packaging to address only a single use case. By leveraging GS1 standards, a single 2D barcode with a GS1 GTIN inside can serve multiple purposes simultaneously. A single barcode can enable limitless opportunities: providing consumers the information they need, powering a global supply chain AND going beep at the front end of retail stores.

Does this mean the end of the 1D EAN/UPC barcode?

No. 1D barcodes (EAN/UPC barcodes) will coexist with 2D for as long as there are uses for them. All Manufacturers and Brands need to include, at a minimum, the Global Trade Item Number (GTIN®) in every barcode on pack to provide a foundation where 2D codes can enable new opportunities.

All scanners will be able to read any barcode

The 2D future will ensure flexibility and choice of barcode for brands and retailers. Scanning systems (including mobile phones) must be able to read and process the desired data from any standard barcodes that may appear on a product.

GS1 is conducting global, consistent and impartial testing to ensure that scanner systems can process and ingest the right information regardless of which (and how many) barcodes are on a product. The goal of this work is to unlock new capabilities for consumers and industry.

Click here to learn more about the 50 year history of GS1 barcodes and our vision for how we'll collaborate to step change the value of the barcode into the future.

Ambition 2027

The companies of the GS1 Board have agreed to align on the ambitious goal of transitioning from legacy linear 1D barcodes to new, more capable 2D barcodes on pack with an initial goal of Retail POS scanners globally capable of reading and processing both old and new barcodes by the end of 2027.

Value for all stakeholders

Consumers use their powerful smartphones to learn about products inside and outside of the store to connect to the products they shop for, buy, use and recycle. Brand manufacturers will be able to integrate their supply chain and consumer engagement goals into one barcode strategy. Retailers will realise a variety of benefits including improved inventory management. Solution Providers will also benefit by providing systems and tools to enable the new 2D world.

Technology is advancing across the world

How capable are retail POS scanners at processing 2D barcodes? Projections anticipate that more than 50% of global retailers will be 2D capable by 2023.[1] Global retailers continue to upgrade their fixed and hand-held scanners with 2D capable scanners at a rapid rate. Additionally, every smartphone camera is able to instantly read some 2D codes.

We expect that 2D scanning adoption will grow at different rates around the world, but one thing is certain: those that accelerate through this transformation fastest will be best positioned to unlock valuable new capabilities.

How will I know which 2D barcode to use?

Making a choice of 2D barcode will be dependent on many factors, such as who will scan the barcode, where the barcode will be scanned, what use cases are being unlocked and what data is needed. Retailers should develop a technology and systems roadmap to enable reading of all 2D barcodes (many of your systems may already be capable of scanning 2D barcodes). Brands/Manufacturers should prepare to make decisions on which 2D barcode to embrace. GS1 will provide guidance and decision support tools to help choose the right 2D barcode based on the use case, the context, the environment and the level and types of consumer engagement desired. GS1 global standards already provide a foundation to enable global interoperability and we will continually update guidance as we progress together into the future years.

The core message to industry is "Choose the use case you want to unlock, use available tools to define the data that you need in your barcode, decisions on which barcode to use will be guided by additional tools…and our role at GS1 is to ensure that, no matter what business need you're trying to address, interoperability is certain."

How to get started

GS1 is working with industry to support 2D implementations and create guidance for assisting in the design of proof-of-concept demonstration pilots. At a high-level, consider the following elements:

- **Retailers**: create a vision for use cases enabled by 2D barcodes, assess your current technical capabilities (scanners and back-office systems) to understand your roadmap to enable scanning of all barcodes, and collaborate with other stakeholders to ensure alignment on goals and outcomes.

- **Brands, Manufacturers and Suppliers**: bring together your supply chain and marketing executives to collaborate on a combined barcode strategy that achieves both consumer engagement and supply chain goals.

- **Solution Providers**: consider the upgrades needed to your systems to enable multiple barcode scanning/printing and support your end-users achieve their top use cases enabled by 2D barcodes.

Questions about the 2D future? Contact the GS1 Global Office programme team to see how GS1 can help you begin your journey toward a new dimension in barcodes!

---

[1] The Global Market for Stationary POS Scanners, VDC Research. November 2019. https://www.vdcresearch.com/vdcc/wp-content/uploads/2019/11/2019-Stationary-POS-Scanners-VDC.pdf