



How Barcode Technology is Transforming the Retail Industry



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INTRODUCTION TO BARCODES IN RETAIL

Barcodes have a long history in retail. While they have been majorly used in inventory and sales procedures, with advancing technology and changing times, they are being used for much more now with advancing technology and changing times. And today, it's impossible to think of retail without barcodes. Traditional use cases, be it inventory management or modern self-checkout counters, barcodes are imperative for running a retail business.

As a trailblazer in the field of barcode recognition SDKs, Dynamsoft is highlighting trends in retail and how barcode technology adds value to this industry. The trends highlighted in this e-book are:

- ▶ Digital Transformation
- ▶ Technologies for Today's Consumers
- ▶ Omnichannel Retail

TRENDS IN RETAIL

TECHNOLOGY IN 2021

Just like many other industries, the Covid-19 pandemic disrupted the retail realm in 2020. Adapting technology became a necessity for all sorts of retailers to cater to the new normal. Since the pandemic hasn't ended, most of these changes are here to stay, along with some new ones. Here are the trends that the retail world will see in 2021.



DIGITAL TRANSFORMATION

According to Shawn Fitzgerald, research director of market research firm IDC, digital transformation is about applying “third-platform technologies to transform decision-making.” Retailers must use technology to unlock new innovation sources rather than just upgrading or modernizing existing legacy systems.

For example, Cloud computing plays a critical role in achieving scalability and agility. Retailers will need to create a cloud enablement strategy and include specific technologies to align with the business to drive today’s customer shopping experience through an omnichannel experience. Part of this cloud strategy will be to incorporate barcode technology into web applications to ensure ease of use for on-line customer purchases.

Another part of this strategy will be based on, “Go to where your customers are and make it easy for them to purchase.” Everyone is on their phone, with close to 3.8 billion people; half of the world’s population will be using smartphones in 2021. Retailers must go to where today’s customers are, which is on the smartphone. Barcode scanning SDKs can be effectively integrated into both web and mobile applications to allow an easier method of shopping for your customers.

AR AND VIRTUAL REALITY FOR TODAY’S CONSUMERS

According to [Nielsen's survey in 2019](#), 51% of consumers showed a willingness to use Augmented Reality to assess products, while both AR and Virtual Reality came out as the top technologies they'd like to use every day for assistance.

As more shoppers are opting for online shopping, Augmented Reality will help retailers bridge the gap between the physical and the digital.

The technology is not just for mega-brands, like Home Depot, IKEA, or Target, because small businesses can also leverage its impact to reap benefits. An example is the feature introduced by Shopify to help brands build their own AR experiences. Shopify reported that products that use AR content have a 94% higher conversion rate than products that did not. Brands must consider making the most out of Augmented Reality to boost their business in 2021. See [Dynamsoft's developer website](#) to learn how to embed QR code to leverage Augmented Reality for retail.

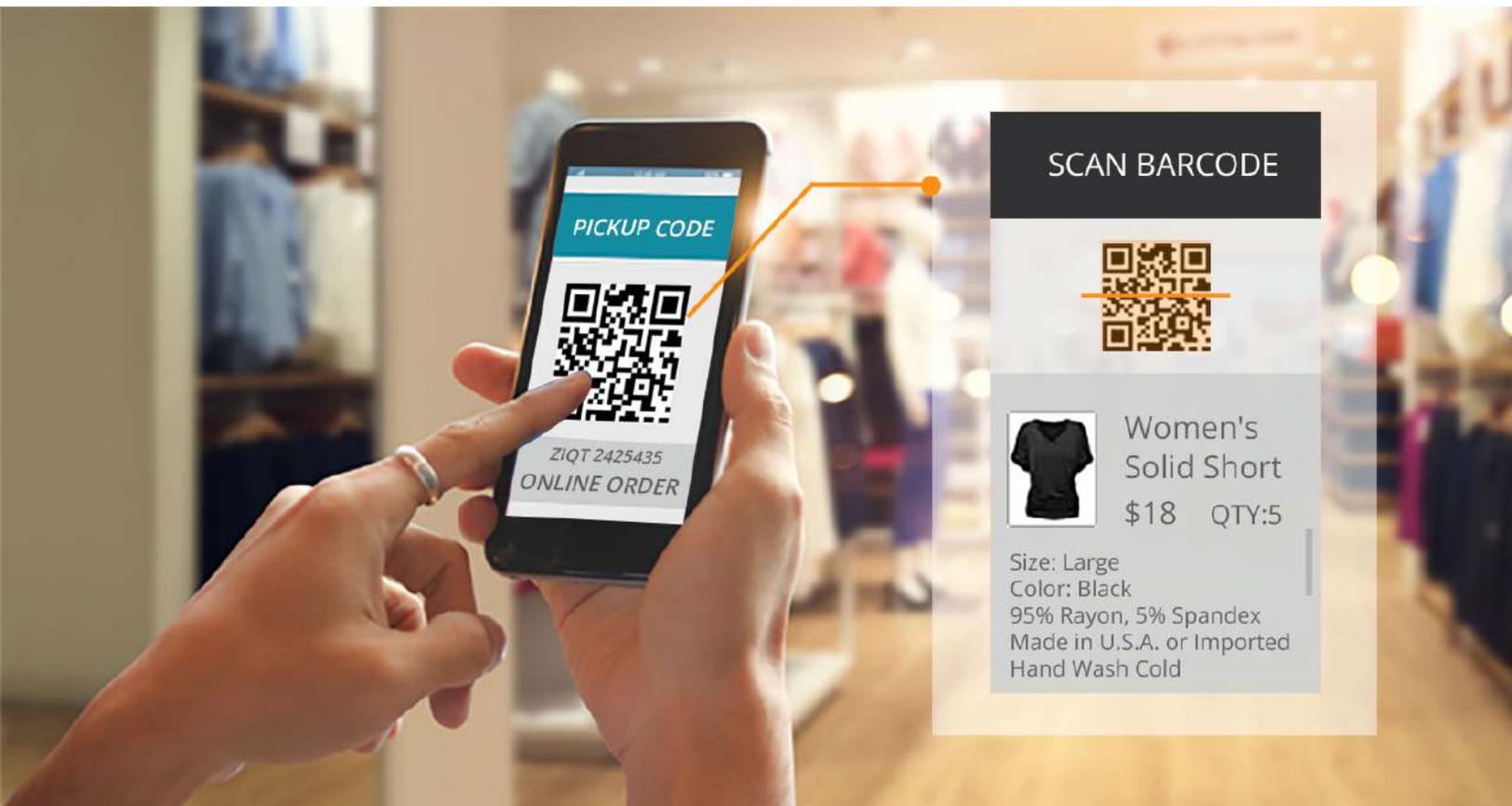
OMNICHANNEL RETAIL

The online retail landscape is flourishing; however, **92% of the retail market is still offline** (brick and mortar). According to the **Harvard Business Review**, 73% of consumers use various channels during their purchase journey.

Online channels are in the midst of a pressure test that will eventually redraw the industry landscape and enhance business performance. Digital integration of channel and internet networks is destined to become an important strategic choice and path to transforming many brands.

Offline retailers are building a more substantial online presence via social media, digital ads, email marketing, SEO, and OTT media services. These technologies are being used to drive customers from online and back into brick and mortar stores to increase the overall potential customer purchase further. A **2019 Forbes study** found that retail sales increased by \$50 when shopping in-store.

Amazon's brick-and-mortar grocery store is a perfect example of how omnichannel retail is thriving in modern times. Customers can either order online or visit the store to make a purchase or pick-up the same day. The barcode on the app indicates their purchase for ease of curbside pick up and can be quickly scanned for confirmation of pick up.



USE BARCODE TECHNOLOGY TO IMPROVE THE IN-STORE EXPERIENCE

As social distancing became imperative, retailers started using technology, such as barcodes, to limit physical contact by click-and-collect as part of omnichannel retail. Barcode technology creates dynamic sales opportunities, offers deeper consumer insights, and empowers employees.

CLICK AND COLLECT

Users making purchases online and then picking up from the store emerged as one of the popular ways to shop in 2020. Click and Collect shopping allows local retailers to provide better customer experiences and compete with online stores. Customer service staff scan the barcodes and hand-deliver the items to their respective buyers outside the store. One of the most exciting benefits of click-and-collect is the same-day delivery that is not always possible with online shopping.

In fact, according to a study, **73% of supermarket shoppers** in the US reported that they would instead pick up items from the store rather than pay shipping costs. Also, 30% stated that waiting for their online order delivery is something they would prefer not to do.

SELF-CHECKOUTS

It was reported in a SOTI survey in Retail Customer Experience that 66% of all shoppers prefer self-checkout and self-service. In comparison, 77% of them would be very likely interested in visiting stores that offer self-checkout facilities.

Mobile POS, or mPOS, is one of the revolutionary technologies in the world of retail. mPOS turns every sales associate into a cashier and helps shoppers checkout without any frustration. Store employees can use dedicated apps on their mobile devices to quickly find stock availability by simply scanning a barcode on the item.

Not to mention, employees can use all areas of the store to create sales opportunities. The store employees are no longer required at the checkout counters and can be involved in other productive tasks such as resolving customer queries or re-stocking inventory.

Self-checkout reports also help in tracking sales performance.

ID SCANNING

By making use of barcode recognition technology and OCR, any smartphone can be turned into an ID scanner. Below are some uses of smartphone ID scanning in retail.



Proof of Delivery

Smartphone ID scanning can be used to capture proof of delivery of an item. Make sure you choose an SDK that is capable of scanning different forms of IDs.



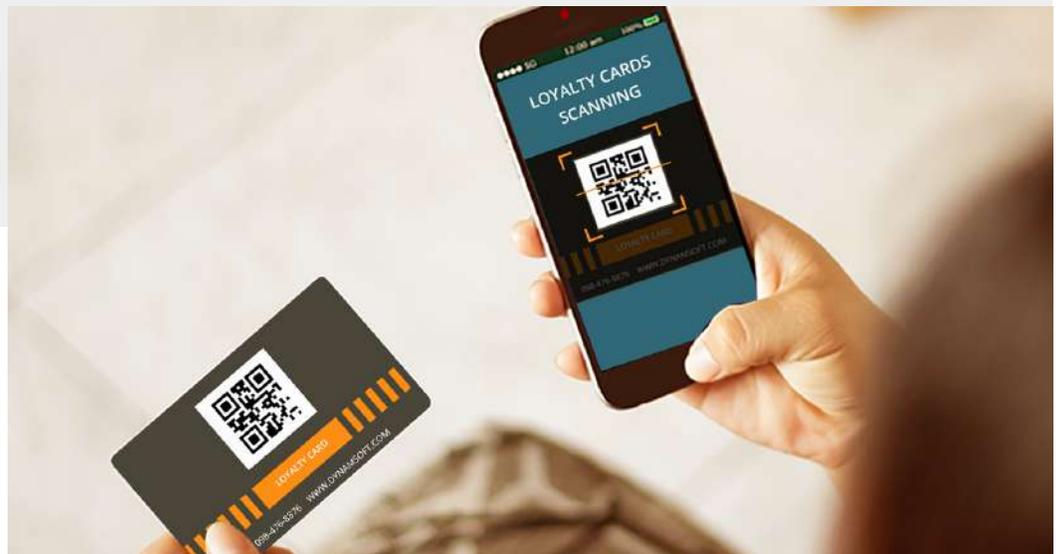
Age Verification

Various items are restricted by age. Smartphone ID scanning allows store employees to confirm age verification in a contactless manner.



Loyalty Cards Scanning

According to [Bain's study](#), loyal customers spend 67% more money than new ones. Smartphone ID scanning is the best option to provide your beloved customers the best experiences as it is fast and easy. Also, QR codes are the perfect option for loyalty cards and coupons as they are flexible and easy to use.





REAL-TIME PRODUCT INFORMATION AT HAND

While shopping at stores, customers can scan the QR codes on shelves and find information from customer reviews and detailed specifications to educate themselves about the product.

Using mPOS on smart devices, retail employees can perform the whole gamut of sales activities to provide a richer customer experience and boost sales. With a single barcode scan, the sales associates can give a product demo, explain the features of any product in detail, look for price and stock availability, delivery methods, product reviews, and even fetch the past data from particular shoppers to resolve queries and ensure compatibility.

INVENTORY MANAGEMENT

Inventory management is the foundation of any successful retail business. A robust inventory management system helps ensure satisfied and happy customers, reduce costs, and increase profit margins by minimizing out-of-stock, reducing shrinkage, simplifying processes, and improving forecasting. To implement an ideal inventory management system in your retail business, barcode technology plays an important role.

BEST PRACTICES FOR INVENTORY TRACKING SYSTEMS

The importance of inventory tracking can be understood from the example that for every \$1 they sell, US retailers are sitting on \$1.43 in inventory. Another report also states that 43% of small businesses still don't use an inventory tracking system at all or are using obsolete manual methods.

If you are planning on implementing an inventory tracking system or making the most out of the existing one you are using, here are some best practices.

Technology is the key

If you still don't have a barcoding system, consider getting one. Prior to implementation, consider which type of barcodes would work best for your business. The barcode type depends on the amount of data you need from it. There are 1D barcodes and 2D barcodes, and the latter can store more significant amounts of data and a more extensive character set than 1D barcodes.

Also, consider physical aspects, such as the labels' durability, their placement on the products, and the material used.

Try before you buy

Whether you are deploying your barcoding system or implementing mPOS, try before you buy. Test your devices to confirm scanning accuracy and performance for all barcodes. Can they support scanning for a large variety of barcodes that could be used for differing assets or products? Finally, confirm data accuracy and make any updates before deployment.



TRACEABILITY - WHY IS IT IMPORTANT

Often used interchangeably, inventory tracking and traceability are actually very different. While inventory tracking refers to the record-keeping of products, traceability is specific to operator performance.

Inventory traceability is critical for operational metrics, such as compliance with safe practices, uptime, throughput, and more. Today, the bare minimum requirements may be fulfilled by simply tracking the shipment of finished goods or receipt of raw materials. Still, the importance of traceability increases substantially when each movement and value-adding activity is entwined in an end-to-end historical chain. The increasing demand for inventory accuracy is another critical aspect that has emphasized a need for enhanced inventory traceability.

CONSIDERATION ON MOBILE INVENTORY MANAGEMENT

Today, **96% of all adult Americans** own a mobile phone, a study suggests. Hence, it becomes essential for vendors to provide their workforce the features and services that work on mobile devices. And, mobile inventory management is one of them. If you are planning to implement mobile inventory management, consider the following:



Usage of Mobile Devices and the Cost Factor

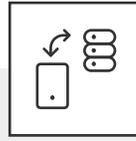
Apart from giving the power of mobility to your workforce, a mobile inventory management tool is more economical than the traditional one. The mobile inventory management application can be accessed directly from employees' smartphones (or business smartphones) without the cost of expensive handheld scanners.



It is different from traditional inventory management

Traditional inventory management systems rely on workstations and PCs, with a store employee being present at the workstation to track inventory. With a mobile inventory management system, an employee can access the inventory details even from the warehouse, enabling a more productive environment.

Another difference is the way orders are placed in both systems. While the traditional method involves placing an order using calls, the mobile inventory management tool allows inventory managers to place an order using the mobile app whenever stock is low.



Don't miss out on the typical features

While you choose a mobile inventory management system for your business, confirm real-time inventory data functionality availability to allow all authorized users to quickly access all the databases, irrespective of their location. To keep errors at bay, implement an inventory management system that has integrated a commercial barcode scanning SDK. There is no need to perform tasks manually as all the processes can be carried with barcode scanning. Other essential features that need to be included are location tracking and document capture with a mobile camera.

CONSIDERATIONS ON

CHOOSING A COMMERCIAL SOLUTION

READING WRINKLED, GLARED, OR DISTORTED BARCODES

Speed is essential in the retail world, but wrinkled, glared, or distorted barcodes may give you a tough time and impact customer service. With a commercial-grade barcode reader, retailers can easily read these difficult or damaged barcodes by embedding barcode reading functionality into their applications. Using specific parameters provided in the SDK, barcode scanning accuracy and decoding rates can be improved. Whether it's a blurred, distorted or small image, Dynamsoft Barcode Reader can read barcodes in all scenarios.



Angled



Curved



Damaged



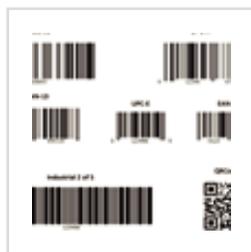
Glare



Low Contrast



Low Light



Multiple



Shadow

1D OR 2D BARCODE

Majorly, there are two types of barcodes, 1D or one-dimensional and 2D or two-dimensional barcodes. As the name suggests, 1D barcodes are linear barcodes made of vertical lines of different widths and fixed gaps. On the other hand, 2D barcodes are more complex and made of square and rectangular patterns that can carry more data.

Usually, 2-dimensional barcodes can support a more extensive character set than one-dimensional barcodes and represent more data per unit area. One typical example of a 2D barcode is the QR or Quick Response code. QR codes allow high-speed component scanning and have high density. Moreover, even if a QR code is damaged or broken, it can often still be read correctly.

Depending on the needs of your retail business, you can choose any of these barcodes. Some of the standard barcode types in retail are UPC-A, UPC-E, EAN-8, EAN-13, Industrial 2 of 5, Code 93, QR Codes, DataMatrix, and GS1 Composite Codes.

TECHNICAL SUPPORT

Technical support is one of the most important aspects while choosing a barcode reader SDK to help reduce time and cost with integration and deployment. At Dynamsoft, we are known for providing enterprise-grade SDKs and superior pre and post-implementation support. We provide timely upgrades and lifetime technical support for our customers to assist with any issue.

The Dynamsoft SDK performs well in general scenarios with its default scanning settings and is fully customizable to meet your specific business needs' best performance requirements.

Choose between a long list of parameters, each containing a set of modes. A mode is a unique function on a barcode reader, and each mode can include several arguments, which are used to refine further or customize the application.



2D BARCODE



1D BARCODE

PLATFORM SUPPORT

Dynamsoft Barcode Recognition SDK

Dynamsoft’s Barcode Reader enables developers to quickly implement 1D and 2D barcode scanning on applications running on different platforms. Here are all the details related to runtime and language environment.

Runtime environment

Workstation:

7, 8, 10

Server:

2003, 2008, 2008 R2, 2012

Android 7 or higher recommended

iPhone 6 or higher recommended

iOS 9.0 and above

Ubuntu 14.04.4+ LTS

Debian 8+, etc.; x64

Languages and environment

APIs:

C, C++,
ActiveX/COM,
.NET, PHP

Projects:

32-bit or 64-bit

Languages:

C#, VB.net, Java,
C, C++, JavaScript,
Python, Swift,
Objective-C, PHP,
etc.

Frameworks:

Xamarin, Cordova,
ReactNative

Dynamsoft Label Recognition SDK

Dynamsoft Label Recognition SDK accurately reads alphanumeric characters and standard symbols from images of varying background color, font, or text size. Popular uses include price tags in supermarkets, inventory labels in warehouses, VINs on cars, vehicle license plates, and ID cards.

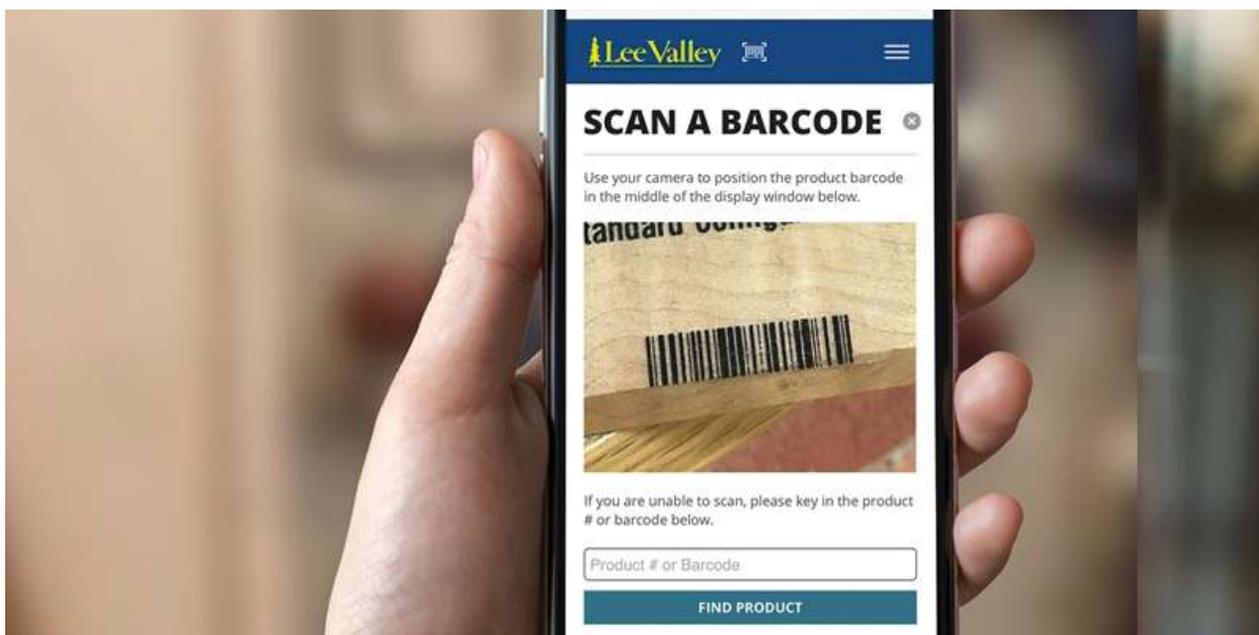
Dynamsoft Label Recognition SDK supports significant platforms (Windows, Linux, iOS, and Android) with its C/C++, C#, Objective-C/Swift, and Java interfaces.

USE-CASES/REFERENCES

LEE VALLEY TOOLS

With the help of the JavaScript edition of the Dynamsoft Barcode Reader SDK, Lee Valley Tools successfully launched a new mobile shopping tool to take its in-store COVID-19 precautions a level ahead. It is integrated with Lee Valley's website, LeeValley.com, and provides a contactless shopping experience to customers in each of its 20 locations across the country.

Ever since the outbreak of the COVID-19 pandemic, Lee Valley Tools has been trying to find ways to enact various in-store safety measures according to public health officials' guidance. The launch of the new mobile feature brings an added level of safety to the in-store shopping experience. With this mobile feature, all that customers have to do is visit the Lee Valley Tools' official website, i.e., LeeValley.com, click on the barcode icon, select the store's location, and start shopping. Lee Valley aims to make customers feel safe while shopping in-store with this online feature.





We Provide Enterprise-Grade
Document Capture and
Barcode Reading SDKs.

About Dynamsoft

We were founded in 2003 with the aim of being the dynamic center for software developers and provide helpful tools to make their development easier and more efficient. With over 15 years of experience in TWAIN imaging, we have helped tens of thousands of businesses and organizations transform their workflow to improve efficiency and cut down cost. We are a gold certified Microsoft partner and an associate member of the TWAIN working group.