

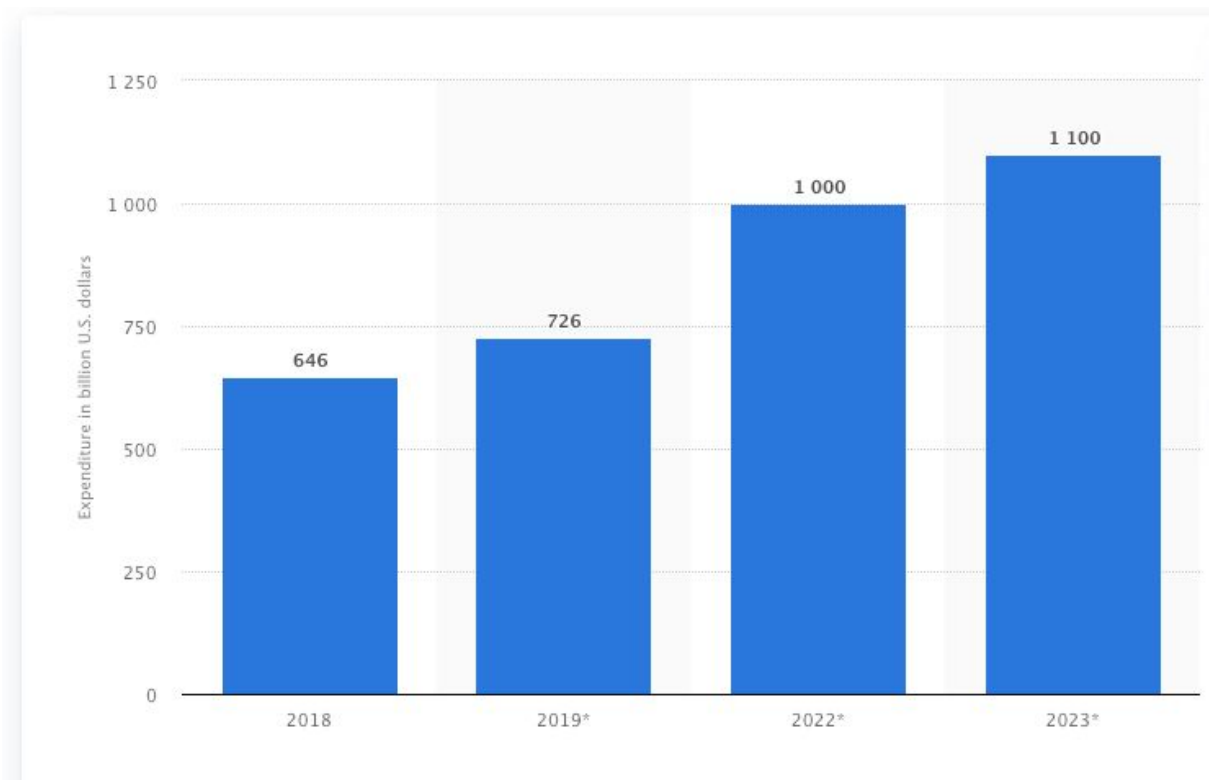
# How IoT Transforms Retail Industry

Meta description: IoT is gradually penetrating the retail market. Read the article to know how it can reinforce sales strategies and optimize supply chain and inventory management.

## IoT in Retail: Everything You Should Know

In the digital transformation era, businesses need to adapt to the cutting-edge technologies to get a step closer to their customers and stand out from the competitors in the saturated marketplace. With such innovations as AI, ML, and IoT, customers' way of interacting and consuming products has modified. Eventually, with a new shifted paradigm, industries embrace these trends to drive growth and enhance business performance.

Nearly 50% of major world-known retailers have already implemented AI solutions into their business operations. Moreover, this trend is anticipated to grow exponentially, and according to [Statista](#), global spending is expected to reach \$1,1mln in 2022.



Let's just take [Amazon who was a pioneer of IoT adoption](#), utilizing robotics to speed up delivery times to their customers, which spurred the further embracing of smart technologies by business innovators.

As for the retail market, by 2025, the number of revenues from IoT [is forecasted to](#) increase to \$35.5 billion. What are the major factors driving such an intense IoT utilization in the retail industry? These are the following:

- cost decrease of IoT-based sensors
- increase in smart payment solutions adoption
- customers' demand to enhance CX.

There are a variety of applications and [IoT retail use cases](#) that can bring value to the retail market: monitoring of customer satisfaction, supply chain management, and food monitoring, tracking assets, and more. IoT provides better insights into customer needs and behaviors, differentiated CX, increased operational efficiencies, etc. Let's take a look at the benefits and challenges you can experience while embracing IoT solutions to your retail business processes.

## The Benefits of IoT in the Retail Industry

Nowadays, retailers have already been reaping the benefits of implementing the internet of things in their businesses. IoT software development allows retailers to track and monitor customers' behaviour, analyze it accurately, and obtain valuable insights to improve marketing opportunities and advancement of sales strategies. Among the most prevalent advantages are the improved SCM, better in-store inventory tracking and customer experience, personalization, theft reduction, and in-store staff optimization. Let's explore this subject in-depth.

### Enhanced Supply Chain Management

With RFID and GPS technology usage, the entire process of supply chain management can be significantly enhanced since each item will be tracked and monitored. Applying IoT into goods will ensure end-to-end data visibility across the entire ecosystem. From the extraction of raw materials to the ultimate destination point, IoT solutions solve traceability issues throughout the delivery process. Supply chain participants get real-time access to information on the product and materials flow. Eventually, retailers are empowered to ensure efficient transport logistics by determining the materials' safety, accurate timelines, and the right conditions. According to [Deloitte](#), 74% of business leaders saw revenue increase after applying smart devices in logistics.

One of the most critical challenges for supply chain management is incorrect storage conditions and temperature-sensitive inventory leading to food waste and health concerns. According to a survey report, [grocers lose \\$70M per year](#) to spoilage. Furthermore, smart retailing devices foster control over supply-chain products and assets and help analyze data in real-time, subsequently, prevent product damage throughout the entire journey. Intelligent devices embedded in products and vehicles can detect misconducts and raise alerts to online dashboards in the event of tampering, fraud, or abnormal temperature levels.

Therefore, there are a variety of applications available for supply-chain processes optimization:

- Fraud prevention
- Testing different vendors
- Reduction of product damage
- Ensure food safety procedures
- Reduce waste

## Smarter In-store Inventory Tracking

The lack of accurate inventory tracking is one of the permanent issues in the retail industry leading to stock-outs or overstocks. IoT applications help capture data that are required for product order management and automation, ensuring inventory visibility. Sales representatives suffer from a disorder on shelves, lack of inventory that is not replenished on time, etc. All these result in unreasonable high expenditures, employees' inefficiencies, mishandled inventory tracking, and missing out on sales opportunities. Moreover, inventory management issues affect customers' experience, especially when they are unable to find an appropriate item.

Inventory tracking solutions powered by intelligent devices such as RFID tags, beacons, sensors, digital price tags, video monitoring tools, etc., can improve procurement planning, as well as take customers a step closer to your business satisfying their needs.

Inventory-centered IoT solutions ensure direct synchronization of physical assets with database servers. Based on POS data analytics, retailers can optimize inventory management and adjust quantity leading to a reduction of stock-out and overstocks.

## Better Customer Experience and Personalization

IoT is geared to help retailers collect data relating to customers' interactions with store items and their feedback after the purchase experience. Based on this experience, machine learning algorithms analyze data providing real-time shopper satisfaction insights to enhance customer engagement and experience.

In comparison with online shopping, customer experience is customized via banner ads and product suggestions. The capabilities of online browsing and purchasing history make online shopping easier to proceed with cross-selling and upselling opportunities. Nevertheless, IoT solutions significantly affect how brick-and-mortar stores operate, providing them with huge opportunities to improve sales and increase revenue.

With RFID chips, beacons, and sensors, retailers are empowered to make the best decisions by offering a personalized experience to their customers. Instead of waiting for customers to find an offer, retailers can push their products and special offers upfront to the customers, for example, on smart displays in stores. Having been hooked at the right moment, a shopper is more likely to make a purchasing decision.

One more benefit of IoT deploying is the combination of in-store customers' interactions with their online browsing history. By collecting insights from online shopping and in-store

interactions of the customer, retailers are able to significantly impact CX enhancement and offer smarter suggestions for upsells.

## Reducing Shrinkage and Fraud

Fraud is the most prevalent type of revenue shrink in the retail industry. Considering the fact that theft immensely affects the net profitability of the retail industry (averaging between [1%-3% of gross profit](#)), retailers are looking for new solutions to ensure the security of their stores and inventory. With smart devices, inventory stuff can get an additional layer of visibility and traceability.

IoT-driven sensor technology provides capabilities to real-time data allowing businesses to track product and delivery to reduce theft. In order to warn of potential theft, smart shelves and camera feed and beacons can send alerts if any suspicious behaviours or activities are detected. Traditional human monitoring cannot be so efficient to validate the sale of goods. Moreover, cloud-based predictive data analytics foster logistic tracking through tracking devices embedded into products or shipping containers. It is easier than ever before to identify misconduct and fraud activities.

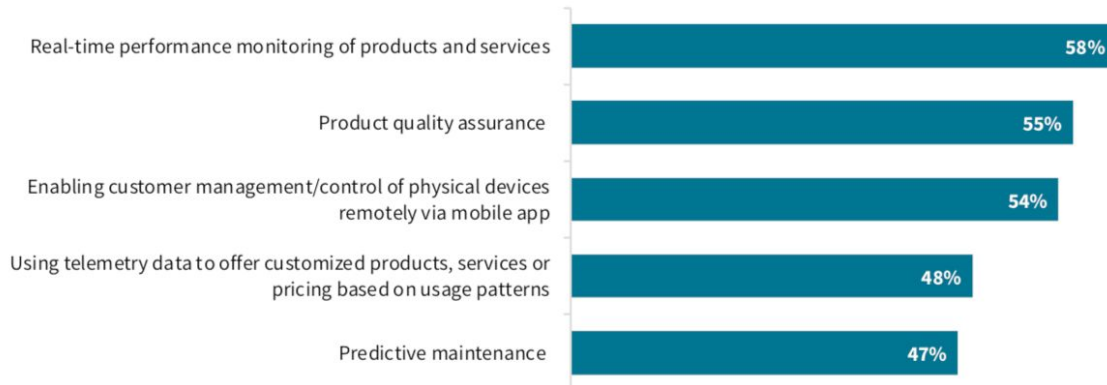
## Optimization of In-store Staff

It is a common thing in stores when a customer needs advice or recommendation while looking for something, and there is no sales associate nearby to help. And in contrast, in many cases, customers turn out to feel uncomfortable and offensive being intervened by a salesperson. Thus, to prevent disrupting customers' experience and facilitate their buying decisions, motion detection, and facial expression sensors, cameras powered by machine learning algorithms are utilized. For instance, once a smart device identifies ambiguity or confusion on a shopper's face, it sends a notification to a nearby salesperson's smartwatch or mobile app.

## 5 Ways IoT Is Transforming Retail Industry: Successful IoT Applications

The Internet of things increases CX velocity and intelligence. There are many use cases available to utilize IoT technology for better conversion rates and improving CX satisfaction. According to [Oracle research](#), 66% of companies utilize IoT technologies to facilitate the customer experience.

## Popularity of CX use cases for IoT



Question text: For which of the following use cases is your company using Internet of Things/connected device technology to enhance customer experience? (Percent of respondents, N=308, multiple responses accepted)

<sup>†</sup> Source: Bain analysis, 2018.

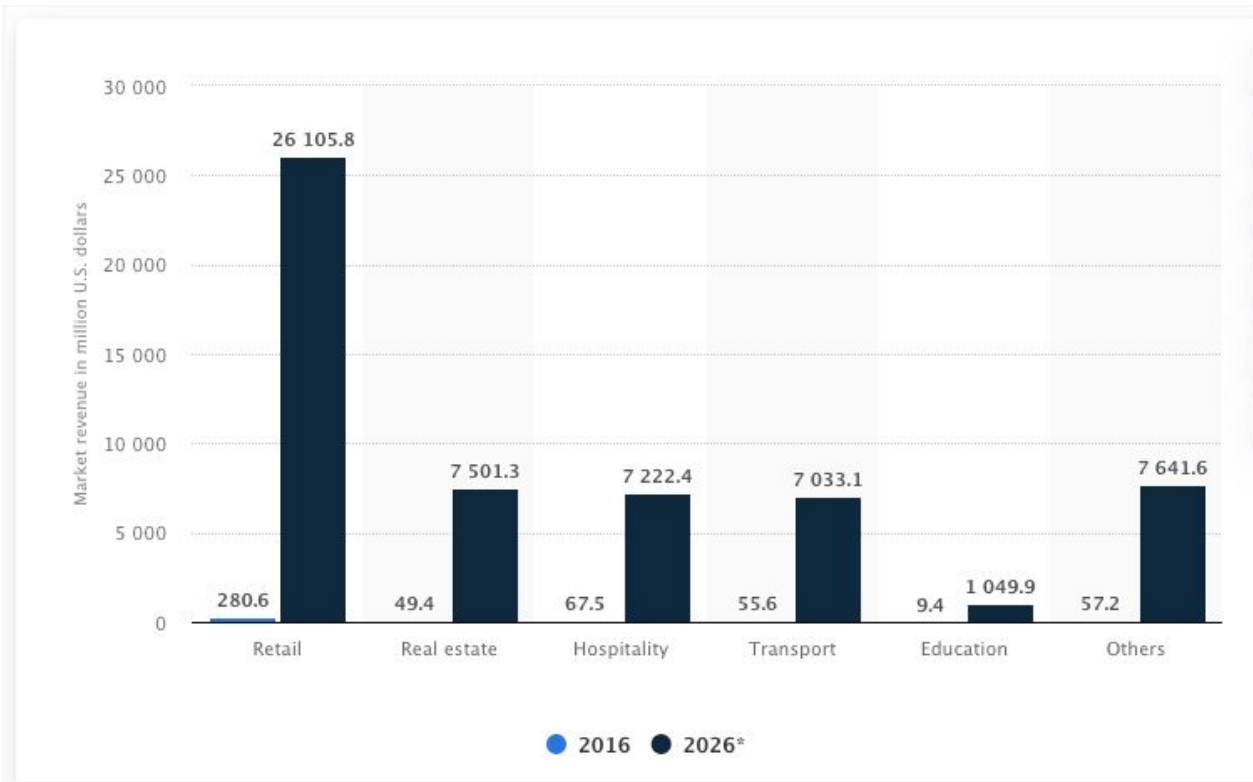
Let's take a look at several applications worth considering for your retail business enhancement:

### #1 Targeted Notifications via Beacons

Beacons are Bluetooth devices used to notify potential customers within geographical proximity of special discounts, offers, events, etc. to their smartphones. For example, when you've previously downloaded a certain app and are going near the store, you will likely get reminders about a discount or special event.

Beacon-triggered content can remarkably increase customers' in-store purchasing decision-making by building a stronger connection between people and places. First, who introduced beacons was [Apple iBeacons](#) to ensure a reliable and consistent experience for customers. According to the Swirl Networks survey, 70% of shoppers admit beacon technology increases their buying decision.

[Statista](#) shows that beacon technology's global market value is estimated to surpass \$2.6 billion in 2026 (Statista), a tenfold increase from \$280 million in 2016.



## #2 Smart Shelves to Optimize Inventory and Supply Chain Management

Smart shelves are comprehensive devices that are designed to fulfill different tasks for supply chain and inventory optimization. With smart shelves, retailers can:

- Keep track of items to ensure they are out-of-stock.
- Ensure order and proper placement of each item.
- Detect potential theft.

With RFID tags and weight security sensors for retail stores, store managers are entitled to get real-time notifications and updates. Such solutions streamline inventory management and eliminate manual errors; furthermore, they are cost-effective since IoT devices will help you save your money on security staff and prevent overstocking and shortage.

Based on RFID technology, smart shelf systems consist of tags, readers, and antennas. How does this process look like? RFID tags transmit data to the reader through radio waves that are further analyzed and processed by IoT systems.

Also, RFID systems are used to optimize transport logistics, minimize product damage, and prevent loss. With tracking solutions, retailers can get more precise data on product delivery, state, and conditions during transportation.

### #3 Personalized Discounts to Incentivize Your Returning Customers

IoT technology is a creative way to develop a marketing strategy in order to attract more valuable and long-term customers. Let's imagine your potential customer has recently been browsing toasters online and visiting a store he/she receives a notification about the personalized discount on toasters. That means stores implement retail sensors around to send loyalty discounts for those who signed up for a loyalty program in advance. Such discounts tailored to a customer's need have the potential to improve conversion rates significantly.

Compared to traditional discounts, customized loyalty rewards serve as an incentive mechanism for returning customers to be devoted ones.

### #4 Automated Checkouts without Cashiers

Long lines have always been an obstacle for a customer to purchase a product. IoT devices can substitute humans and deliver a much better experience with mobile POS (point-of-sale) terminals. When a customer leaves the store, this system reads tags on each item and conducts a payment operation.

Moreover, automated checkouts may save you a ton of money since you do not need to hire multiple sales assistants and cashiers. According to [McKinsey](#), IoT devices and applications will accelerate work processes efficiency resulting in saving of \$150 billion to \$350 billion globally in 2025.

### #5 Robot Employees Can Empower Staff to Be More Focused on CX

The image of robots passing by you in the store may be frightening. It can also provide vast opportunities for better customer experience by optimizing business operations and cutting costs. The future of retail automation is already here. How society will adjust to this shift toward automation, and how much time is needed is still vague. Nevertheless, autonomous robots are gaining traction, especially due to the COVID-19 pandemic.

Robotics applications can be leveraged in retail businesses to enhance in-store customer service and warehouse management as well. Let's take an example of a giant e-retailer, Amazon, which has many robots to fulfill orders in warehouses.

In 2016, in cooperation with Fellow Robots, home improvement retailer [Lowe](#) introduced *LoweBot* who helps customers quickly navigate through the store and find items they are looking for.

[YOUTUBE VIDEO]

Target's robots called Tally also provide retail assistance designed to keep track of product inventory on the shelves empowering sales assistants to focus more on customer service.

[YOUTUBE VIDEO]

## IoT Challenges and Solutions in Retail Industry

Often retailers do not know where to start when it comes to implementing IoT technology in their business processes. Whereas there are obvious benefits, there are also specific challenges retailers can face with. Let's shed light on them.

### Challenge: Infrastructure

Huge volumes of IoT data require robust networks and infrastructure for retailers to digitize their stores. Data centers and cloud solutions need significant investments, which most businesses couldn't afford.

**Solution:** In order to implement new technologies, businesses need to estimate their investments. A step-by-step approach will definitely impact positively on retailers' ROI. Therefore, before implementing big-scale systems such as inventory tracking, start, for example, with utilizing smart devices to optimize lighting systems.

### Challenge: Data Security

Along with offering huge opportunities for retailers, a single customer view affects cross-industry concerns that have been amplified by GDPR since many participants are involved in the purchase journey (manufacturers, logistics, stores, etc.). Therefore, data security and privacy are the biggest challenges due to a big number of connected smart devices throughout the supply chain which means an increased possibility of security breaches.

Take, for example, DDos attacks which are performed by infecting IoT smart devices with botnets and common vulnerabilities. Social-engineering attacks are also one of the most popular methods when employees click on phishing links, unconsciously granting attackers access to the entire infrastructure.

**Solution:** To secure their systems, retailers have to partner with cybersecurity experts and educate their staff with possible threats and vulnerabilities. IoT software developers can help ensure the security of devices through end-to-end encryption, secure passwords, etc.

### Challenge: Data Management

In order to gain valuable insights from IoT systems, retail employees need to have relevant qualifications and technical skills and then proceed with data processing and analyzing. Data is a valuable asset required to properly manage its sources. Without correct data management, you will not achieve data integrity that is important for the data's searchability and traceability. By collecting more and more data in the system, retailers need to secure and maintain data integrity, otherwise, it will be worthless and could be compromised.



**Solution:** Retail businesses need to hire [IoT professionals, third parties with a technical background](#) who will be responsible for data management.

## Key Takeaways

In 2019, the revenues from the IoT sensors market amounted to over 11.9 billion U.S. dollars worldwide, with forecasts predicting that this number will increase to about 43 billion by 2025.

IoT solutions empower retailers to get valuable insights that they can use to streamline their supply chain and inventory processes, enhance customer experience, increase marketing conversions, and boost their ROI as well. While access to customer data via IoT-powered devices makes retailers step closer to customer satisfaction, at the same time it opens a door for challenges such as cyberattacks, bad data management, and overinvestments.

Nevertheless, nowadays, in combination with AI, ML, IoT is gaining traction due to the demand on the market and the need of society to keep social distance.

If you are looking for enterprise-scale internet of things solutions, [feel free to contact our software development team](#), who will help you optimize your expenditures and gain a competitive advantage.