

ROBOTS IN RETAIL: Examining the Autonomous Opportunity

Results of a new RetailWire industry study



The arrival of COVID-19 sharply accelerated the deployment timeline for robotic technologies in retail and signals a growing presence in the post-pandemic marketplace.

Introduction

Protecting customers and associates has never been more important than during the COVID-19 pandemic. Virtually overnight, retailers adopted new methods to manage social distancing, store and warehouse cleanliness, and contactless processes for in-store shopping and last-mile fulfillment.

To meet these requirements, several innovative retailers turned to robotic systems, which can perform repetitive, manual functions in a safe, cost-effective way and also scale to meet the needs of both large and small retailers.

On a parallel track, retailers have also expanded the use of autonomous technology in warehouses, DCs and micro-fulfillment centers. Many of these are used for fast and efficient order picking, an operational necessity during the current boom in online shopping. Examples of warehouse bots are found in such retail segments as grocery, pet products, apparel and mass merchants.

Until last year, the adoption of robotics in retail had been on a steady upward track. However, findings in this study show that the unique circumstances of the pandemic have sharply increased interest in robotic automation technology and accelerated its path to broader adoption.



Examples of robots in retail today include:

A national warehouse club that recently expanded its fleet of autonomous in-store floor scrubbers;

Grocers that use robots equipped with computer vision to audit inventory on shelves;

A large retailer using autonomous tugs for point-topoint delivery in many of its stores.

Part 1: The Rising Importance of Robotic Automation

The first step when advocating for an emerging technology is to get a seat at the corporate decision-making table and, once there, to present a clear, executable business strategy that justifies the cost of investment.

Robotic automation is usually considered to be in a first-step phase in retail, so it is surprising to find in our survey that a large majority of retailers (64 percent) believe it is important to possess a clear business strategy for robotic deployment this year. Of these, 17 percent believe it is very important. (See Figure 1.)

However, examining these numbers more closely reveals a sharp difference between retailers with less than \$100 million in annual sales and those with more than \$100 million.

Findings show an overwhelming majority of large retailers (77 percent) say it is important to create a clear robotics strategy compared to just 30 percent for smaller retailers.

77% of large retailers say it is important to create a clear robotics strategy versus just 30 percent for smaller retailers.

Figure 1

Importance of having a clear, executable and budgeted robotics automation strategy in place in 2021

Of little importance **36%**

17% Very important

Somewhat important **47%**

Biggest hurdles standing in the way of investment for in-store robotic automation



Budget issues, chosen by 62 percent of retailers, are at the top of the list when looking at hurdles that stand in the way of securing investment in robotic projects. (See Figure 2.) However, it should be noted that lack of budget is an ever-present fact of corporate life and a common hurdle for most technologies to overcome. As robotic applications continue to evolve and include more business operations, costs are likely to decrease and budgetary restrictions ease.

More revealing insights are found in the second and third hurdles on the list — lack of clarity of benefits (41 percent) and misconceptions/apprehensions about the technology (32 percent). For robotic projects to move forward today, these are the main obstacles that need to be addressed.



In the current retail landscape, in-store robotic functions range from scanning shelves to order picking, floor cleaning and more. This study finds the four robotic applications or functions retailers consider to be most effective are: scanning shelves for stock-outs (59 percent), order picking (47 percent), moving product loads in stores from the backroom to the floor (35 percent), and pricing accuracy checks (35 percent). (See Figure 3.)

In the next group are floor cleaning and planogram compliance both at 21 percent. It is noteworthy that all the applications or functions tracked here show significant levels of retailer interest, yet some rank higher based on the respondent's understanding of and experience with the technology.



Figure 3

Type of robotic applications/functions that will be the most effective





The general perception of robotic automation in retail is that it is an early-phase technology that will ultimately become widespread at some point in the future, possibly in three years or more, which is a similar path previously traveled by cloud platforms, AI, big data and others.

However, this study shows that robotic technology is taking an accelerated track. When asked about the status of investment in in-store robotic solutions right now, 26 percent of retailers say they currently have projects underway. This means one in four retailers is currently working on either a full robotics deployment or some form of pilot test. For an emerging technology this is a surprisingly large number. (See Figure 4.)

Even more significant is the massive 47 percent of retailers that say they will be involved with an in-store robotics project within the next 18 months — a stunning number and among the most notable findings in the study.

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Part 2: The Pandemic Sharpens Focus on Robotics

The retail industry has broken many boundaries during the unprecedented COVID-19 pandemic, including its position on the importance of robotics automation.

A big cohort of retailers say that, due to factors emerging during the pandemic, the importance of robotic automation has increased. A big majority (63 percent) say they have seen a moderate or sharp increase of importance in warehouses and DCs; and 42 percent say so about use in stores. (See Figure 5.)

When isolating large retailers, the numbers that say the importance of robotic automation has increased are even larger: 73 percent for use in warehouses or DCs and 50 percent for use in stores.

73%

of large retailers say the importance of using robotics in warehouses or distribution centers has increased due to factors that emerged during the pandemic.

Figure 5

Change in the importance of robotic automation due to factors that emerged during the COVID-19 pandemic



Factors brought on by the pandemic that influenced a change (if any) to the importance of robotics automation in stores or warehouses



Since retailers altered their view of robotic technology due to factors that emerged during the pandemic, it is important to know which factors were at the heart of this change. (See Figure 6.)

The top three are: need to provide a safer, cleaner store for shoppers (56 percent), need for social distancing (47 percent), and need to improve on-shelf inventory availability (44 percent.)



For insight into possible long lasting effects of the pandemic, we asked:1. How will consumer expectations change in terms of store cleanliness?2. How long will retailers have to maintain current standards for store cleanliness?

In a post-pandemic future, even after the widespread introduction of vaccines, a big majority (72 percent) of retailers say they do not anticipate much change in consumer expectations toward in-store cleanliness. (See Figure 7.)

Interestingly, a big group (30 percent) of small retailers (with annual revenue less than \$100 million) anticipate a full return to pre-COVID consumer expectations toward in-store cleanliness. However, this assessment is not shared by the large retailer group, where we find just 15 percent agreeing that pre-COVID expectations for in-store cleanliness will return.

Figure 7

Anticipated change in consumer expectations toward in-store cleanliness after the introduction of COVID-19 vaccines



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How long will the cost of maintaining the current heightened standards for store cleanliness need to continue?



Regarding the cost of maintaining pandemic standards for store cleanliness, 53 percent say it will continue for six to 18 months. This group is split between those who believe it will continue for six to 12 months (31 percent) and those who believe it will be 12 to 18 months (22 percent) before the additional costs dissipate. (See Figure 8.)

However, the largest group (36 percent) believe there is no end in sight for the need to maintain current standards of store cleanliness. This view aligns with the business principle that proposes: once the bar of expectation has been raised, there is no going back.





To handle in-store cleanliness, retailers use one of two methods or a combination of the two: in-store staff or outsourced cleaning firms.

Study findings show a relatively even split between these methods - 33 percent primarily use in-house staff, 28 percent primarily use outsourced firms, and 39 percent use a combination of both. (See figure 9.)



Key Study Takeaways

1. Accelerated adoption

One of the major findings in this study is the takeaway that robotic technology is on an accelerated track for widespread adoption in retail. Not only are one in four retailers currently working on a robotic project, but 47 percent of retailers say they will be working on an instore robotics project within the next 18 months.

These are not the kinds of numbers indicative of an emerging technology in an early phase of deployment in retail, but of a technology just a few short years from widespread adoption.

2. Extended benefits

In fact, as robotic technology gains a foothold in store operations, broader benefits are likely to fuel future growth, such as the ability to capture granular, real-time data about products on shelves and customer buying patterns, monitor pricing and planogram compliance and keep tabs on out-of-stocks. Armed with this kind of data, retailers will be able to discover actionable insights, make smarter decisions and increase store productivity.

3. Increased interest

Clearly, factors that emerged during the COVID-19 pandemic raised the profile of robotic automation in warehouses and stores to the point where a big majority of retailers (63 percent) say robotic solutions have increased in importance for use in warehouses and DCs and four in ten (42 percent) see greater importance for stores.

And the factors that drove increasing interest in robotic technology are likely to have long-lasting effects on both consumer expectations and retail efforts to maintain current standards of store cleanliness. These are not the kinds of numbers indicative of an emerging technology in an early phase of deployment in retail, but of a technology just a few short years from widespread adoption.



4. Post-pandemic relevance

A big majority (72 percent) of retailers say they do not anticipate much change in consumer expectations toward in-store cleanliness, even after the vaccines are broadly distributed. In fact, the largest group of retailers (36 percent) believe there is no end in sight for the imperative to maintain current standards of store cleanliness. A more modest one in five retailers sees floor cleaning as a "most effective" function for robotics, perhaps pointing to a lack of clarity in this area.

For shoppers, the benefit of robotic technology in stores and warehouses is quicker, safer, and more reliable service. For retailers, the benefit is avoiding inventory disruptions, lost sales, and freeing labor from repetitive tasks

5. Upstream potential

However, it is not a stretch to envision a wider variety of tasks performed by robotic technology both in stores and in warehouses, including self-driving vehicles (for roads and sidewalks), point-topoint mobile delivery bots (for large stores and shopping malls), and fully automated stores.

Catalyzed by forces unleashed by the pandemic, autonomous robotic deployment in retail has sharply accelerated and appears to be on a path to reach mainstream adoption within the next two-to-three years.

Methodology

Polling for this study was conducted during March 2021 and included 136 respondents.

Of the respondents, 34 percent were retailers or wholesalers. Other large groups included consultancies/agencies (29 percent), tech solution providers (22 percent), and brand marketers/manufacturers (12 percent).

The largest segment of retail represented in the respondent pool at 43 percent was fast-moving consumer goods, a category that includes grocery, drug and convenience stores. Two other large segments in the study were specialty (e.g. electronics, furniture, hardware, home, etc.) at 15 percent and apparel (including footwear and accessories) at 15 percent.

Finally, the respondent profile included a broad range of annual revenue sizes that ran from greater than \$5 billion (15 percent) to less than \$100 million (51 percent). The total group of all retailers with annual revenue greater than \$1 billion was 29 percent.



About Brain Corp

Brain Corp is an AI software leader that powers the world's largest fleet of autonomous mobile robots operating in commercial indoor public spaces. The BrainOS platform and its cloud-connected autonomy service are used by global manufacturing partners to successfully build, deploy, and support commercial robots at scale across industries and applications. Through intuitive software and controls, BrainOS also enables end customers to easily leverage the power of robotics to offload repetitive, labor-intensive tasks related to floor care, in-store inventory delivery, and shelf-scanning. This frees employees' time to focus on higher-value responsibilities. Working with its partners, Brain Corp has deployed over 14,500 robots within retail, grocery, malls, airports, hospitals, warehouses, and other industries.

For more information, please visit www.braincorp.com



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