

Amazon strives to put checkouts on the shelf

Futuristic convenience shop that dispenses with cashiers and queues reshapes the look of bricks-and-mortar retailing

LESLIE HOOK — SEATTLE
ANNA NICOLAOU — NEW YORK

Five years ago Amazon started working on a secret project: how to eliminate the checkout queue in stores. Amazon executives reasoned that most other aspects of physical shopping had been almost perfected, except for one thing — nobody likes waiting.

The result of that project is Amazon Go, a futuristic convenience store where shoppers are tracked by hundreds of video cameras on the ceiling and a computer algorithm that tallies up their bill when they exit. Amazon calls this “just walk out” shopping, because there is no counter and no queue, just a few turnstiles and the bill is charged to a customer’s Amazon account.

The store, which has been in testing since December 2016 and opens to the public today, represents Amazon’s most provocative effort to reshape the future of bricks-and-mortar retail.

Located on the ground floor at the centre of Amazon’s campus in Seattle, the shop displays posters advertising the “just walk out” shopping experience and each receipt comes with a so-called trip timer that tells customers how long they have been shopping. The items for sale are similar to what might be found in a delicatessen or a corner shop and has an in-store kitchen that prepares fresh sandwiches and salads.

Amazon was founded as an online-only bookshop, but its aggressive push into physical retail has surprised — and alarmed — many of its retail competitors. The company operates 13 bricks-and-mortar bookshops, several grocery pick-up points and, since a \$13.7bn

acquisition last year, hundreds of Whole Foods stores across the US.

However, the complexity of the Amazon Go store’s design means it is currently more of an experimental concept rather than a mature technology that can be easily and cheaply replicated. The store was supposed to open to the public in the spring of 2017 but was delayed amid reports that it was not working as expected.

Dilip Kumar, who oversees the technology behind the Amazon Go store, says: “Five years ago when we started this, we said: ‘can we push the boundaries of computer vision and machine learning to create this effortless experience for customers to come in, take what they want, and leave?’”

Mr Kumar points to the cameras that nearly blanket the ceiling, and explains that there are also weight sensors on the shelves, which are less useful as different items can have the same weight.

“The holy grail is video understanding,” he says. “To be able to understand and interpret and know exactly what is happening. Doing this at scale and getting transaction-level accuracy is what makes this challenging.”

He explains that the algorithm has struggled when the store gets crowded. “It is much more convoluted when you have 50 people picking up multiple items or browsing,” he says. “They are occluded, they occlude each other, items are getting occluded, and the items are small.”

The tech team has been improving

the algorithm so that it is trained to handle large numbers of shoppers and also the occasions when customers partially cover an item with a hand as they take it from a shelf. To help make identification easier, certain items have a special dot code — similar to a bar code but designed with circles and diamonds — that makes it easier for a camera to read from a distance.

Mr Kumar says that the technology is “very, very accurate”, but declines to specify when the company might open other Amazon Go stores. He says the company has “no plans” to introduce checkout-free shopping in Whole Foods stores, or in the Amazon bookshops. Nevertheless, rivals are investing in similar technologies as they battle for a share of the US grocery business. Kroger, the largest standalone US grocery

Walmart, which derives half of its \$500bn annual sales from food, is testing shopping without cashiers



chain, is rolling out its own take on the cashier-free experience this year.

Visitors to a Kroger supermarket will be able to scan the bar codes of food on their smartphone as they walk through the aisles, and pay at a self-checkout machine upon leaving the store. The company says it will introduce this technology to 400 of its 2,700 stores in 2018.

Walmart, which derives half of its \$500bn annual sales from food, is testing shopping without cashiers in places including Dallas and Orlando.

The company says that by the end of this month, 100 of its supermarkets will allow customers to buy groceries through a smartphone app – and their only interaction with a human will be when they show their digital receipt to an employee before walking out the shop door.

Doug McMillon, chief executive of Walmart, has referred to himself as a “gadget-guy” and promised to mould Walmart into more of a tech company.

At a conference last week he summed up the challenge for retailers: “All around the world, people want to save money and they want to save time.”

Touch and go



Revolution in store: shoppers enter the Amazon Go outlet by using a smartphone app to scan a code linked to their Amazon account — Jenny Riffle

