Revolutionizing retail with AI

Sensei creates autonomous, cashier-less stores that free customer time

A retail revolution has emerged from the challenges of the global pandemic. Autonomous stores with frictionless checkout and zero queues are bringing valuable benefits to both consumers and retailers. Customer-centric technology is creating a new era of phygital retail by combining physical stores with a digital shopping experience.

Shifting shopping parameters

Consumer retail expectations have changed. The pandemic has spurred new customer demands for simpler ways of buying goods. Customers are choosing simple, time-saving shopping experiences without worrying about long queues.

This has accelerated the demand for autonomous retail. The business benefits are driving the minds and missions of visionary retailers. Retailers are rallying around autonomous retail as a strategic priority.

Sensei is leading this transformation of the retail landscape. With a frictionless checkout experience with no cashiers, shoppers' bank cards are automatically charged upon leaving the store. No scanning, waiting, or queues. This alone reshapes the quality of life.

"The mindset behind the innovation is to create a world where people don't lose any more time," says Vasco Portugal, co-founder and CEO at Sensei. "So we are, in a sense, returning time to customers."

Sensei technology is returning value to customers and retailers by digitalizing store operations across Europe. A combination of sensor fusion, in-store real-time computer vision, AI, and machine learning keeps track of all the products that shoppers choose to pick up from or return to the shelf. With a basket accuracy of greater than 99%, all in-store stock is monitored in real time for highly efficient and precise inventory control, boosting data-driven store operations to the next level.

sensei

Industry: IT services

Country: Portugal

Vision

Create automated, cashier-less, and data-driven stores for retailers to offer customers a frictionless shopping experience that combines physical shopping with digital convenience.

Strategy

Boost retailer efficiency with secure, artificial intelligence (AI)–powered, data-driven solutions, which help deliver a frictionless customer shopping experience.

Outcomes

- Improve customer shopping experience with frictionless checkouts

- Achieve a basket accuracy of greater than 99% with full visibility for all in-store shopper activities

- Increase store operations efficiencies with real-time, in-shelf stock monitoring

Retailers are keen to increase in-store customer footfall. Sensei is leading their cause with secure, reliable, AI-powered solutions for autonomous stores. Its mission is to deliver a frictionless shopping experience that keeps retailers competitive in a post-pandemic digital economy.

Accelerating consumer trends

The age of advanced automation and artificial intelligence has brought transformation to numerous sectors; healthcare, automotive, and retail—Sensei's main area of expertise. The specialists saw an opportunity.

"We believed that the retail experience could be much better than it is right now," says Vasco Portugal.

Sensei observed numerous trends in automation and digitalization. The company benchmarked these trends against other sectors and came to a realization. "When we created Sensei, we saw that autonomous driving was already becoming a reality," says Joana Rafael, co-founder and COO at Sensei. "We thought: why not create an autonomous store? The technology was already here."

Shoppers' habits and demands were at the heart of the transformation focus.

"People want experiential shopping when they go to a brick-and-mortar store," Joana Rafael says. "Billions of people go shopping in physical stores all around the world. They love in-store shopping due to sensory experience that is not replicable through a digital channel. But everyone still wants convenience."

This includes retailers that want streamlined store operations for their customers. They understand that customers don't want to waste time queuing to pay. It's an expectation that has been raised by other companies in the digital sphere.

"More than ever, we are used to not wasting time in daily transactional activities," says Joana Rafael. "Getting an Uber, for example. And in supermarkets, we don't expect to be forced to wait when making a purchase. At Sensei, we are on a mission to change the way the world shops with autonomous stores. No queues, no friction, no hassle for shoppers, and offering unmatchable shopping experiences."

Store automation game changer

Sensei is offering innovative technology solutions to help retailers in some sectors of the market achieve post-lockdown prosperity.

The autonomous store conversion starts by digitalizing the entire store to capture and process all in-store activity. This includes using state-of-the-art computer vision and machine learning-based technology to detect, track, and analyze all customer behavior and products. The system informs the retailer about all shelf interactions, stockouts, or misplacements in real time, thus paying obvious dividends in inventory efficiency, and, therefore, the retailer's bottom line.

AI capability improves the experience of the shopper while bringing unprecedented efficiency to the retail operation. But it comes at a cost.

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"State-of-the-art AI and sensor fusion technologies require large computational power," explains Nuno Moutinho, co-founder and CTO at Sensei. "We are processing, in real time, massive volumes of data from multiple sensors deployed at the store level." Sensei partnered with Hewlett Packard Enterprise to equip its computing lab with cutting-edge technology. This featured HPE ProLiant DL380 servers with NVIDIA® GPUs to process and store data at an unprecedented level. Sensei is now equipped to spearhead the retail sector revolution.

"HPE and NVIDIA are of paramount importance in our autonomous store solution," Joana Rafael says. "We combine the most reliable enterprise-grade hardware in the market with our own proprietary hardware and software platforms for real-time processing of all our autonomous stores' activity."

Store security is also an important factor, with all customers being registered and identified by the system, and a valid payment method associated with their accounts. This ensures that all goods exiting the store are correctly and automatically paid for which is a strong deterrent against theft.

Intelligent store building

Intelligent computing has accelerated the new retail paradigm.

"Computer vision is essential to the new experience," says Vasco Portugal. "Huge amounts of visual data are captured from the physical store space. This is presented to customers in our F.A.S.T platform, a business intelligence platform for operational data insights and customer insights at the store level."

In turn, this insight benefits retailers and store employees.

"It enables retail managers to easily implement the planograms that they have designed for the store," says Joana Rafael. "This empowers staff with the right tools, making them much more efficient and proactive. Teams are equipped with insight tools that help them better serve their customers."

Sensei is confident that the HPE and NVIDIA collaboration brings insights beyond great technology.

"It's a privilege to be an Original Equipment Manufacturer partner with HPE," Joana Rafael says. "HPE and NVIDIA are giants in this sector. They offer enterprise-grade service and reliable and secure infrastructure, a major benefit for our retail customers. This computing infrastructure allows us to be the best in our class, being able to perform very demanding activities in our stores."

The high-performance club also promotes access to the most secure and reliable server technology on the market. In addition, HPE provides a footprint of partners and support around the globe. This is a definite plus for Sensei and its expansion strategy.

"The global footprints set by partners of HPE support our growth," says Joana Rafael. "It helps our ability to deploy autonomous stores throughout Europe and the world."

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Autonomous retail—the next frontier

In merging the emotional with the digital, Sensei has created a harmonious retail disruption. Shopping pleasure remains but is revolutionized by a far simpler purchase and exit system. And technology is built around human behavior and benefit. Seamless processes mean that there's no need for shoppers to adapt.

"Sensei technology and autonomous retail have enabled retailers to create a healthy new mix," says Joana Rafael. "Thanks to HPE, retailers can mingle the emotions of store experiences with the efficiency of a digital store."

Sensei is enthusiastic about its future in the retail revolution ahead.

"We want to be market leaders of this big opportunity," says Vasco Portugal. "Sensei wants to be at the forefront of the big changes that will occur in the next few years."

Solution

Hardware

- HPE ProLiant DL380 servers
- NVIDIA GPUs
- Intel® Xeon® Scalable processors

Key partners

- NVIDIA

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