Case Study

Grocery Retailers, Store Owners, Retail Technology Decision-Makers

German Grocery Store Improves Self-Checkout Experience with AI

At its new store, EDEKA Beckesepp uses self-checkout solution from Diebold Nixdorf–powered by Intel–with AI-based age verification and produce recognition to reduce transaction time and staff interventions

EDEKA Beckesepp has long been a pioneer in embracing technology to enhance the grocery shopping experience, and its new Waltershofen, Germany, store exemplifies this commitment. EDEKA Beckesepp has been serving shoppers for more than 125 years and operates ten supermarkets across the city of Freiburg and the surrounding area. The company has a reputation of continually investing in technology to enhance convenience and service.

The new store in Waltershofen, a district within Freiburg, is 920 square meters (~9900 sq feet) and is located within a combined residential and commercial building. The store is designed to offer a modern, urban shopping experience.

By introducing computer vision-enabled self-service checkout systems in this store, EDEKA Beckesepp is transforming how customers shop, making checkout faster, easier, and more seamless, while freeing staff to focus on customer service and essential store operations.

Faster Produce Scanning and Automated Age Verification

A standout feature of the system is fresh produce recognition. Customers can scan fresh produce items, like fruits and vegetables, that don't have barcodes, directly at the checkout terminal. Using a camera mounted above the scale and advanced AI algorithms, the system identifies each product and its quantity, displaying it instantly on the screen. This removes the need for manual selection or weighing in the produce section, speeding up the process and improving accuracy.

The technology also delivers a sophisticated solution for age-restricted purchases (see Figure 1), such as alcoholic beverages. When these items are scanned, customers can opt for automatic age verification. A camera analyzes facial characteristics with advanced AI to determine if the customer meets the required age. Transactions continue seamlessly for eligible shoppers, while store staff intervene only for underage customers or those who opt out.

Importantly, this GDPR-compliant system does not store images or personal data, ensuring privacy while maintaining efficiency.

The Waltershofen EDEKA Beckesepp store operates without staff from 6 p.m. to midnight, giving customers more flexibility. During these hours, age-restricted purchases are managed via ID card authorization.

To serve their customers in these ways, EDEKA Beckesepp turned to Diebold Nixdorf, an Intel® Industry Solutions Builders partner, for an advanced self-checkout solution with advanced Vynamic® Smart Vision software running on an Intel® architecture-based terminal.

Compact Hybrid Terminal for Small Stores

The Diebold Nixdorf solution for EDEKA Beckesepp includes both self-checkout (SCO) terminals – powered by Intel® Core™ processors – and software that enables the advanced features.

The SCO terminal used by EDEKA Beckesepp is the DN Series® EASY eXpress, a terminal designed for self- or attended check out, or for use as an information device.

The compact system is designed for small-store format and can be flexibly mounted to the wall, a desk or on a cash rack. The system can be configured with security features including security scale options and electronic article surveillance (EAS) using either radio frequency or acousto-magnetic merchandise tags.

The DN Series EASY eXpress is capable of running DN Vynamic Smart Vision self-service software platform that adds new capabilities and features to keep up with changing consumer demands. For its Waltershofen store, EDEKA Beckesepp utilized the Vynamic Smart Vision fresh produce recognition feature and the age verification functionality.

Reducing Fresh Produce Scanning Times

Fresh fruit and vegetables are often not barcoded and either must be weighed and/or manually added onto a shopper's order. This adds extra time – and possibly frustration - to a consumer's shopping process, which can create longer checkout queues.

Vynamic Smart Vision | Fresh Produce Recognition (see Figure 1) utilizes an AI computer vision camera mounted next to the scale to identify the produce and either display the product name or a short picklist on the screen. Consumers place an item on the scale, where it is identified using the computer vision algorithm. No more searching through long lists of produce items or typing in a price look-up (PLU) code.

The algorithm has been trained on hundreds of fruits and vegetables. New items can be added to the database centrally or in-store by store associates.

The system reduces staff interventions for non-barcoded items by 45% and reduces the consumer's item processing time from 15 seconds to three seconds per item.[1]

[1]Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

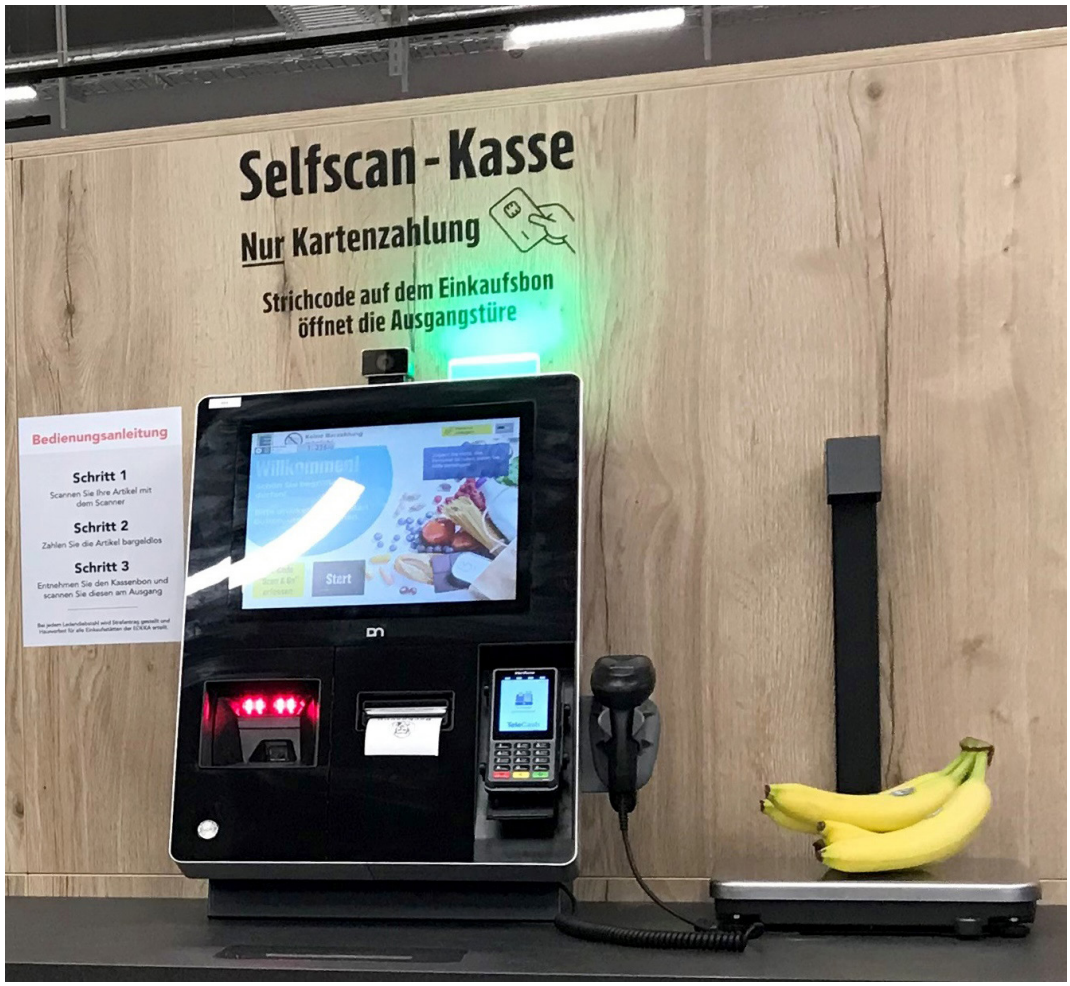

Figure 1. EDEKA Beckesepp simplifies fruit and vegetable checkout using Vynamic Smart Vision / Fresh Produce Recognition from Diebold Nixdorf.

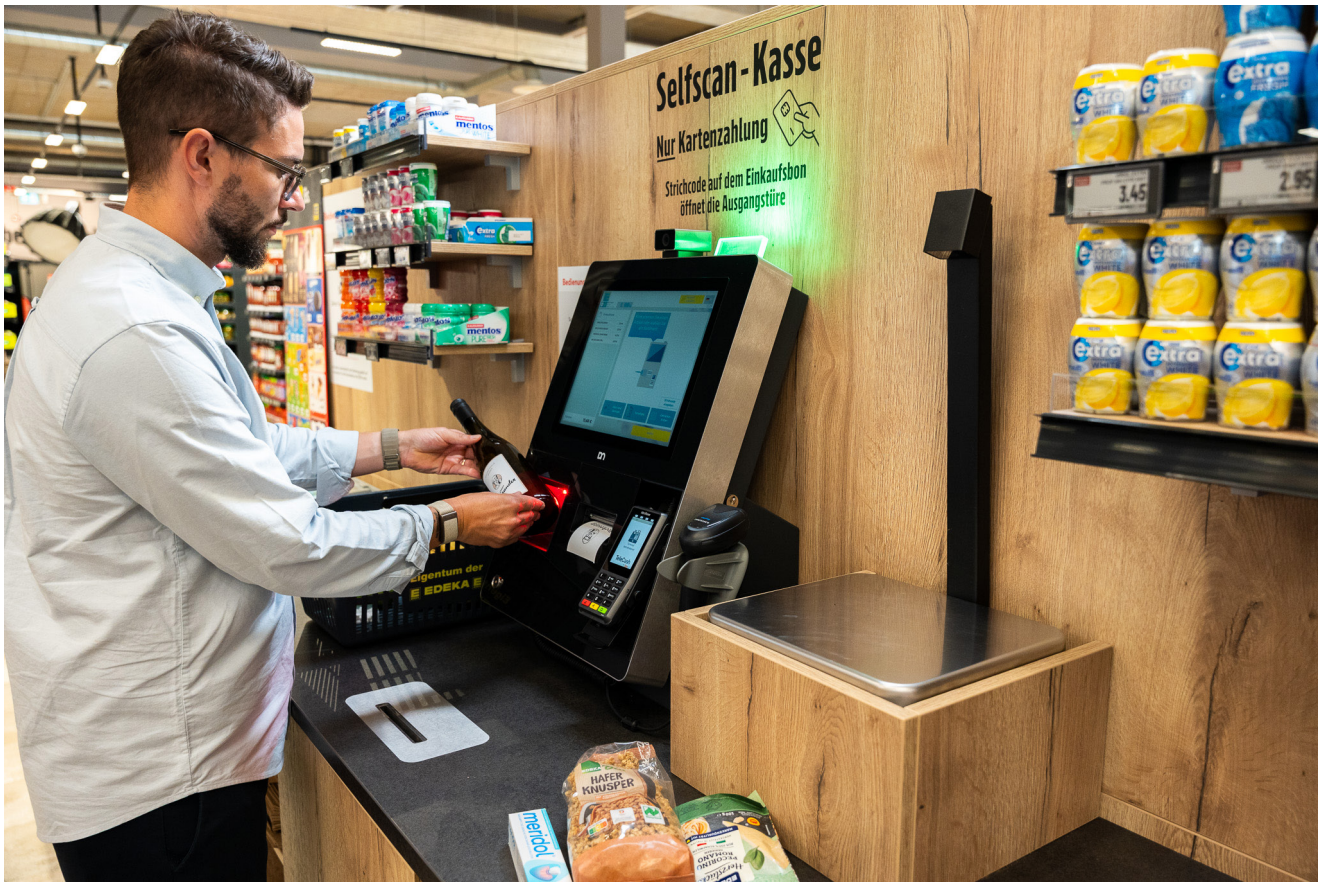

Figure 2. EDEKA Beckesepp customer uses Vynamic Smart Vision / Age Verification from Diebold Nixdorf.

Speeding Age Restricted Check Out

Age-restricted products can cause customer service backups as staff verify age and clear the system to allow the purchase. With Vynamic Smart Vision | Age Verification, the number of interventions can be reduced dramatically because the system allows consumers to prove their age in less than 10 seconds (see Figure 2).

The system works using AI computer vision and starts as soon as the age-restricted item is scanned. The consumer gets a notification that they have the option of an anonymous age estimation check. A camera placed on top of the DN Series EASY eXpress photographs the customer's face and analyzes it using a sophisticated AI algorithm to determine a consumer's age. The GDPR-compliant system doesn't recognize the customer's face, and no data is kept once the transaction is complete.

Vynamic Smart Vision | Age Verification is able to evaluate even a face partially blocked by a scarf or other clothing. Stores are able to configure age acceptance level and mobile attendants are only notified when the system has a negative match. The whole process takes 10 seconds resulting in increased efficiency and customer throughput.

The software can evaluate the known background behind the unit to avoid attempts to spoof the system with a photo. The algorithm is trained across ethnicities, skin tone, gender and age and is accurate to 2.19 years.[2]

Powered by Intel® Core™ Processors

The DN Series EASY eXpress product family is available with multiple CPU options from the Intel® Core™ processor family. Intel Core processors integrate multi-core architectures with each core operating at up to 4.4GHz, enabling simultaneous execution of multiple tasks, which significantly enhances performance. The processor includes both Performance-cores for compute-intensive tasks and Efficient-cores optimized for a balance of performance and power efficiency.

Delivering Customer Convenience

"Diebold Nixdorf and Intel are working together to shape the future of retail self-service. By combining deep industry expertise with cutting-edge technology, we deliver solutions that accelerate digital transformation and help retailers create more efficient, secure, and engaging experiences for their customers. This collaboration underscores our shared commitment to driving innovation and setting new standards for the retail industry," said Thomas Blechert, Director Product Management Hardware Touchpoint from Diebold Nixdorf.

[2] Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Conclusion

Self-checkout speeds customers' grocery check-out and payment which is efficient for both shoppers and store staff. But it's important for the experience to be delightful for the customer. This was a front-of-mind concern for the management of EDEKA Beckesepp when they were planning their new store in Waltershofen.

Could AI computer vision help them with age verification and fruit and vegetable recognition, thus eliminating two of the barriers to customer satisfaction? They turned to Diebold Nixdorf who put together a self-checkout solution based on Intel Core processors that was customized to the needs of the new store and kept EDEKA Beckesepp ahead of its customers' demands.

Learn More

Diebold Nixdorf Home Page

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