

An Intro Guide Into Robotics

For Future-ready Retailers

2025.

CONTENTS

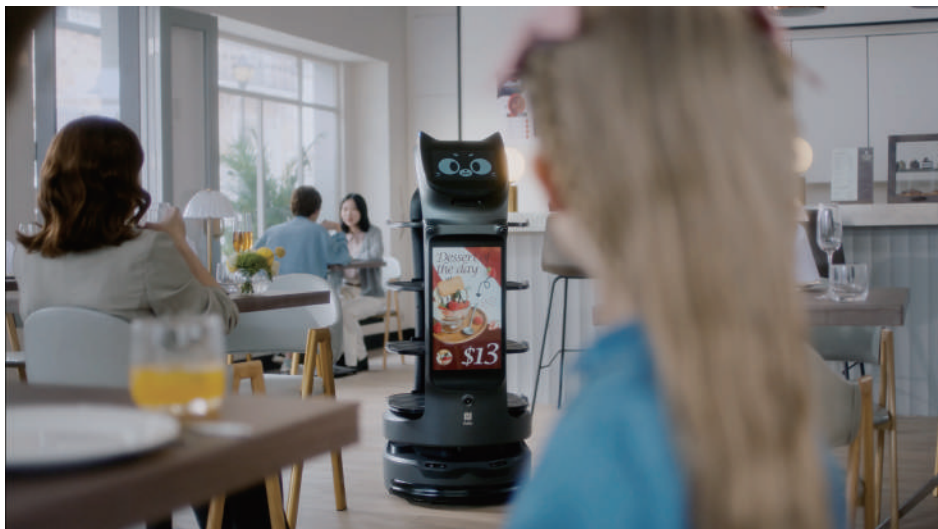
03--04	Introduction
05--06	Solving Retail's Labor and Operational Challenges
07--08	Growing with Data Analytics and Collaborative Robotics
09--10	Authentic Brand Identity and ROI Potential
11--12	Conclusion
13	References

Introduction

Automation Solutions: A Strategic Imperative

The retail industry in 2025 faces critical challenges that demand bold approaches and visionary leadership. A saturated market, lingering inflation, consumer frugality, and shifting consumer behaviors create hurdles but also bring opportunities. 89% of retailers forecast revenue growth, but for C-suite retail leaders to capitalize on this, they must prioritize automation and digital transformation. Deloitte's Evan Sheehan highlights —

Retail businesses from Toronto to Tokyo need to balance "long-term investments...while managing rising costs and declining consumer spending power."



BellaBot Pro promoting daily deals to hungry customers

Shrewd executives will determine how to maximize their investments in new tech to overcome persistent pain points. For example, e-commerce is set to account for 20.1% of global purchases by late 2024, so savvy online retailers will implement automation to optimize inventory accuracy and on-time delivery(OTD) rates.

Trust is vital: 99% of online shoppers read reviews, and 96% seek out negative feedback.

Brand leaders know that negative reviews, sluggish customer service, and delivery delays erode consumer confidence. Compounding this, volatile social media trends—like viral products and influencer-driven sales—strain already encumbered inventory and logistics.

Brick-and-mortar stores also face mounting pressures. Inventory mismanagement costs retailers \$1.2 trillion annually, while theft and misplaced stock further erode margins. Human errors can inflate carrying costs up to 30%, frustrating customers, increasing inefficiencies, and weakening brand approval.



PUDU CC1 navigating busy grocery stores to keep floors clean even during business hours

It's clear—automation and robotics are now tactical and reputational necessities. With over 50% of the \$87 billion robotics market targeting retail, these technologies address persistent challenges and drive growth. Bernard Marr of Forbes calls 2025 a “watershed year where science fiction meets shopping reality.”



KettyBot Pro roaming grocery stores to help customers find popular items more easily

Robotics have evolved far beyond executing basic functions while becoming more cost-effective. Delivery, cleaning, and industrial automation help solve persistent industry issues like labor shortages, inventory and delivery costs, and inconsistent service and facility maintenance levels. Additionally, IoT and AI equip businesses with deeper insights to sharpen customer-focused strategies.

Advancements in the tech industry have made it easier for companies to incorporate robotics into existing systems and realize ROI within two years. Today, retailers can easily deploy robotics solutions, fostering Human-robot collaboration (HRC) to elevate customer service.

Forward-thinking brands opt for scalable solutions, such as those offered by Pudu Robotics, that seamlessly adapt to growth goals and surge in demand. To overcome challenges and seize opportunities, executives must prioritize these three themes: resolving labor inefficiencies, leveraging data for smart collaboration, and upholding a positive brand reputation with higher ROI. These areas of emphasis demonstrate how scalable HRC can improve brand performance, agility, and reputation in 2025 and beyond.

For C-suite retailers, automation isn't just a fad—it's the north star for navigating future-ready success.

Solving Retail's Labor and Operational Challenges: Robots to Fill Gaps and Boost Efficiency



PUDU CC1 performing 'edge cleaning' for hard to reach undershelf spaces.

Retailers face persistent labor shortages and escalating turnover, threatening profitability and service quality. These labor inefficiencies are compelling brand leaders to adopt human-robot collaboration (HRC) and automation technologies.

Delivery, cleaning, and industrial robotics connected through IoT streamline inventory management, optimize warehouse operations, and enhance delivery accuracy. For example, RFID tracking and Digital Asset Management (DAM) systems reduce human errors, centralize resources, and improve supply chain resilience. These HRC solutions have helped bridge labor gaps, saved significant work hours, and increased employee retention. Workers enjoy having robots perform repetitive, arduous, and unpopular tasks such as floor cleaning, product hauling, and promotional advertising.



KettyBot Pro is popular and helpful for customers of all ages

By addressing workforce challenges through collaborative automation, retailers can lower turnover rates, upskill employees, and build a more productive workforce while maintaining service quality. Cleaning and delivery robots offer a transformative solution by handling repetitive and time-intensive tasks, allowing human employees to focus on value-driven interactions.

The industrial floor sweeper, the **PUDU MT1**, is designed with active dust control and navigates multi-floor spaces. It can easily tackle cleaning spaces the size of Hard Rock Stadium in Miami, or the Venetian Resort Convention Center in Las Vegas, roughly 7.43 acres (30,000 m²) in 18 hours flat.



The PUDU MT1 AI-powered sweeper maintaining expansive shopping mall spaces

The **PUDU MT1** Reduces labor shortages and turnover by automating repetitive floor cleaning, allowing custodial staff to focus on more urgent tasks. Workers prefer working alongside cleaning automation that upholds cleanliness and safety compliance because it allows them to enhance their technical skills through autonomous and human-guided modes.

For instance, The **PUDU T300** addresses labor shortages and reduces worker churn by autonomously transporting loads up to 300kg through narrow gaps, reducing worker fatigue and injury. Its follow-me mode streamlines the restocking and replenishment of physical stores, while the auto-delivery mode simplifies assembly line work in e-commerce warehouses and factories.

Similarly, delivery advertisement robots like **BellaBot Pro** and **KettyBot Pro** cruise through brick-and-mortar stores, displaying products on their trays and advertisements on large LED screens, optimizing inventory visibility and promotional activities.

These service robots can also come programmed with "Shopper Assistance" to greet customers at the door, show the customer the aisle and shelf where desired items are located, and even guide the shopper. These features allow employees to prioritize more high-value customer interactions, reinforcing their integral part of the jobs.



This BellaBot 'Kerfus' is so beloved, it even has it's own social media account!

By leveraging these technologies, retailers can mitigate the impact of labor shortages while ensuring seamless and efficient workflows. This dual benefit drives higher sales and fosters a more engaging shopping experience.

Growing with Data Analytics and Collaborative Robotics – Smarter Insights for Strategic Decisions

In dynamic global retail markets, leveraging data analytics and robotic collaboration is crucial for strategic decision-making. Executives in e-commerce and physical retail stores can tackle critical retail challenges by improving efficiency, cutting costs, and delivering actionable insights into customer behavior.

Through seamless integration of human-to-robot and robot-to-robot interactions, retailers can optimize operations, manage inventory with precision, provide clarity in marketing and sales efforts, and become more resilient against rising costs and shifting consumer spending.



This customer-friendly KettyBot Pro is outfitted with a bespoke 'Walmy' skin for maximum brand awareness

Pudu Robotics' robots, such as the 4-in-1 floor cleaning robot, the **PUDU CC1**, and the delivery robots **BellaBot Pro**, **KettyBot Pro**, with the industrial inventory hauler, the **PUDU T300**, leverage cutting-edge IoT technology and data analytics to enhance human-robot collaboration.

The **PUDU CC1** handles vacuuming, scrubbing, mopping, and sweeping with unrivaled efficiency and safety. Its IoT integration and PUDU Cleaning App provide real-time insights into cleaning performance, including time, area, and status, while enabling remote control.



PUDU CC1 maneuvering aisles while cleaning like an athlete on a mission

By digitizing outcomes and generating detailed reports automatically, the PUDU CC1 simplifies inspections and optimizes workflows. Integrated with the PUDU Management Platform, it helps retailers maintain spotless environments, identify operational patterns, and make data-driven layout and resource allocation decisions.

BellaBot Pro and **KettyBot Pro's** advanced tray sensor enables precise item recognition and robot-to-robot collaboration, make them pivotal for customer-facing promotions. By tailoring speed and arrival locations to the items detected, both delivery robots gather data about which promotional items customers enjoy most in physical retail stores offer actionable insights. When retailers align this data collection with the content displayed on integrated advertisement screens, they can deliver personalized product promotions in real-time.



PUDU T300 leading the way to help workers with front of store restock

Meanwhile, the **PUDU T300** transforms e-commerce and physical store retail operations with IoT capabilities like elevator control, e-gate access, and app-based remote calling. The industrial hauler also features software API interfaces to simplify integration into legacy systems and collaborates with up to 20 other robotic systems to share operational data.

Pudu Robotics' commitment to innovation underscores the value of combining advanced analytics with collaborative robotics. By delivering tools that enhance human decision-making and operational agility, Pudu empowers organizations to achieve smarter insights and strategically align their operations with evolving customer needs.

Authentic Brand Identity and ROI Potential – "Maximizing ROI and Bold Branding Through Engaging and Collaborative Solutions"



BellaBot is always ready for their close up with its interactive screen interface

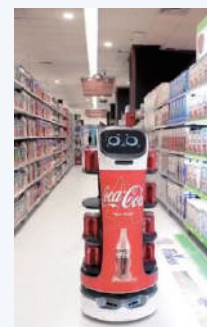
Automation plays a pivotal role in helping retailers maintain a strong brand reputation and achieve rapid ROI, making it an indispensable tool for growth in 2025. Delivery, advertising, and cleaning robots not only enhance efficiency but also transform how customers perceive and interact with a brand.

For instance, the **PUDU T300** revolutionizes back-end operations in e-commerce warehouses and physical retail stores, ensuring timely restocking and high on-time delivery (OTD) rates. This level of reliability keeps online

customers satisfied and fosters trust while also guaranteeing physical shelves are consistently stocked, creating an inviting shopping experience that aligns with the brand's promise of quality and availability.

Interactive robots like the **KettyBot Pro** and **BellaBot Pro** take customer engagement to new heights by combining service with dynamic marketing.

These approachable and user-friendly delivery and advertising robots captivate and delight shoppers with interactive touch screens and vibrant advertising displays, delivering personalized product promotions in real-time.



BellaBot also rocking bespoke 'skins' to maximize promotional advertising

These delightful examples of automation not only drive immediate sales but also leave customers with a memorable, tech-forward impression of the brand. By curating delightful in-store experiences that blend convenience with creativity, these robots encourage repeat visits and build emotional connections with shoppers, solidifying long-term loyalty.



PUDU MT1 operating in crowds on both indoor and outdoor terrain.

On the operational front, cleaning robots such as the **PUDU MT1 and CC1** ensure that retail spaces consistently reflect a polished and professional image. By maintaining spotless floors and adhering to strict safety standards, these robots create an environment that prioritizes customer comfort and employee well-being.



PUDU CC1 vacuuming carpeted spaces, showing off its full 4-in-1 cleaning dynamics.

Clean and safe spaces are non-negotiable in retail—they reinforce trust, improve customer satisfaction, and project a commitment to excellence. This proactive approach to cleanliness minimizes risks, enhances the shopping experience, and bolsters the brand's reputation.

Together, these technologies address every touchpoint of the customer journey, from back-end logistics to front-end interactions. By streamlining processes, delivering superior customer experiences, and ensuring operational excellence, automation enables retailers to exceed expectations while driving rapid ROI.

With solutions like those offered by **Pudu Robotics**, retail leaders can future-proof their operations, meet evolving customer demands, and grow their brand presence in an increasingly competitive marketplace.

Conclusion



KettyBot Pro greeting customers, to entice new patrons and give extra warmth to returning customers

The retail industry in 2025 is transforming rapidly, with consumer demands and competitive pressures forcing bold innovation.

Retail leaders must embrace advanced automation to stand out, build trust, and achieve fast ROI. When brand executives adopt new technology, they're not just upgrading operations—they're redefining the customer experience.



PUDU CC1 blending into environments and unobtrusively keeping spaces 'spill free'.

Pudu Robotics offers groundbreaking solutions like the PUDU MT1, CC1, T300, BellaBot Pro, and KettyBot Pro, designed to elevate every aspect of e-commerce and brick-and-mortar retail. Delivery haulers stock shelves and fulfill promises while advertising robots captivate customers through real-time, personalized promotions. Cleaning automation maintains spotless environments that exude professionalism and care. Together, they create a streamlined ecosystem that optimizes workflows, drives sales, and enhances brand perception.

These leading solutions don't just work—they transform what customers can perceive retail brands as capable of. By integrating IoT-driven robotics, retail decision-makers can maximize efficiency, delight customers, and stay ahead of the competition. The best part? These advanced solutions offer scalability, seamless integration, and ROI that decision-makers notice fast.



The future of retail starts here. Discover how **Pudu Robotics** can help you deliver unmatched customer experiences and future-proof your operations.

Visit [Smart Delivery Robot-Pudu Robotics](#) today or reach out—we're always ready to explore how our technologies can elevate your brand. Let's create the retail experience your customers deserve.



References

1. Marr, Bernard. "The Future of Retail: 10 Game-Changing Trends That Will Define 2025." Forbes, 29 Oct. 2024, www.forbes.com/sites/bernardmarr/2024/10/29/the-future-of-retail-10-game-changing-trends-that-will-define-2025. Accessed 17 Jan. 2025.
2. Mondal, Tamros. "Article : Robots in Retail: Driving Innovation One Aisle at a Time." WNS, 29 Oct. 2024, www.wns.com/perspectives/articles/articledetail/627/robots-in-retail-driving-innovation-one-aisle-at-a-time. Accessed 17 Jan. 2025.
3. Retail Insight Team. "Unveiling the True Cost of Inventory Inaccuracy." Retail Insight, 30 Apr. 2024, www.retailinsight.io/blog/unveiling-the-true-cost-of-inventory-inaccuracy. Accessed 17 Jan. 2025.
4. Sellers Commerce Team. "34 Ecommerce Statistics in 2024 (Global Data) - SellersCommerce." Wwww.sellerscommerce.com, 14 May 2024, www.sellerscommerce.com/blog/ecommerce-statistics/. Accessed 17 Jan. 2025.
5. Sheehan, Evan. "Global Retail Outlook 2024." Deloitte, 3 Oct. 2024, www.deloitte.com/global/en/Industries/consumer/analysis/global-retail-outlook.html. Accessed 17 Jan. 2025.

