

# Emerging Trends and Innovations on Retail segment

With the dynamic landscape, the retail industry is undergoing a transformative shift driven by diverse technological advancements. Technology enhancement plays a vital role at different stages of the retail industry, from enhancing user experience to providing services to end-users.

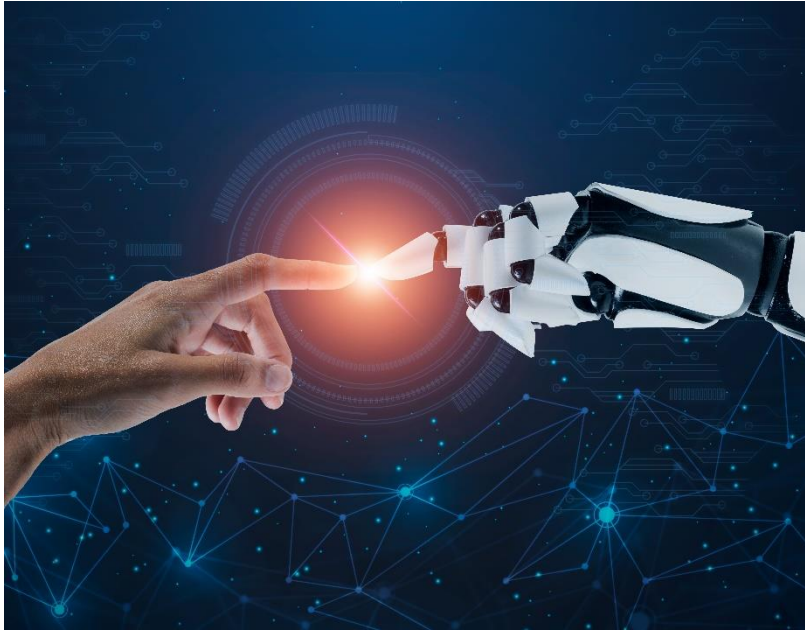


Footfall tracking, also known as people counting, is a solution that enables retail analytics by using data captured from sensors to measure and improve store performance, understand customer behaviour, improve the conversion rate, and optimize staffing at counters in real-time. The technologies used in People Counting Systems (PCS) have evolved over time, incorporating different sensor interfaces such as CCTV cameras, IR-based cameras and thermal cameras, sensors with 2D, Time-of-Flight (ToF), 3D, and 3D with stereoscopic capabilities. These technologies provide accurate and crystal-clear datasets, aiding in deriving advanced analytical trends in the retail industry.

Continuing with technological advancements, recent footfall counters are equipped with HD cameras that offer real-time streaming of videos. This convergence of solutions with video analytics, including Heat Maps, Demography, Face Recognition, and more, widens the scope of end analytics and provides in-depth insights into different trends.

**Unleashing the Power of AI and IoT:** As Artificial Intelligence (AI) and Machine Learning (ML) become integral to technology, robust algorithms can run on metadata from footfall counters, videos, and images. This enables data insights through system learning, such as detecting repeated customers at different outlets of the same retail

store, analysing the dwell time of groups of customers in different zones, and assessing customer satisfaction by understanding emotions.



Additionally, with the integration of the Internet of Things (IoT), Wi-Fi analytics and Bluetooth Low Energy (BLE)-based staff exclusion have become widely used applications. BLE, with its Angle of Arrival (AoA), Angle of Departure (AoD), and Received Signal Strength Indicator (RSSI), enables wireless tracking and

distinguishes staff from customers. BLE-based solutions also offer a low-power alternative.

Wi-Fi connectivity can be leveraged for counting individuals, where the detection of smartphones by searching the Wi-Fi network provides information on returning customers and dwell time.

Cloud infrastructure, on the other hand, makes it possible to centralize data, and using big data analytics and the aforementioned technologies, one can provide diversified trend analyses of various Key Performance Indicators (KPIs) in the retail segment.

As we step into this era of intelligent algorithms and connectivity, the cloud infrastructure acts as the central hub, enabling the consolidation of vast datasets and facilitating diverse trend analyses of Key Performance Indicators in the retail sector. With these advancements, retailers are empowered to make informed decisions, optimize operations, and ultimately deliver a seamless and tailored experience to their customers, marking a transformative and prosperous future for the retail industry.

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