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 Northwestern Retail Analytics Council

The Retail Analytics Council (RAC) is the leading organization focused on the study of consumer shopping behavior across retail platforms and the impact of technology. Established in August 2014, RAC is an initiative between Medill's Integrated Marketing Communications department, Northwestern University and the Platt Retail Institute. [Learn more.](#)

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## Multipurpose Retail Robots Advance Data Analytics and Automation

Unique Mobile Data Collection Boosts Operational Efficiencies While Transforming Customer Experiences

*By Tim Rowland, CEO, Badger Technologies and RAC Retail Robotics Advisory Board Member*

Despite massive disruption in the retail industry, brick-and-mortar stores still account for more than 90 percent of total retail sales. What matters most, however, is the steady adoption of e-commerce across every facet of the retail industry.

In the hotly competitive grocery segment, for example, e-commerce is projected to outpace in-store sales growth tenfold by 2022. According to a May 2018 sales forecast compiled by retail consultancy Brick Meets Click, online grocery sales are predicted to grow at a compound annual rate of 13 percent, compared to 1.3 percent for in-store sales over the same timeframe. This modest growth for brick and mortar highlights the need to lower operational expenses in order to achieve expected profitability targets.

The rise of e-commerce, combined with the rapid pace of digital technology advancements and evolving customer expectations, has created a "perfect storm" of opportunities to transform retail. For starters, consumers want faster, better, and more personalized shopping experiences. Retailers also are seeking more compelling, convenient in-store shopping experiences to elevate customer loyalty and operational efficiency.

### Data and Automation Dynamics

Historically, retailers have invested heavily in sophisticated retail management information systems for strategic planning, inventory control, financial management, supply chain, logistics, and more. Aside from point-of-sale (POS) data that is streamed directly into corporate finance systems, retailers often struggle to collect accurate in-store data. Limited visibility into store conditions, the amount of inventory on shelves, and what is happening with special promotions or other activities are the biggest impediments to operational improvements.

Store-side data gaps hinder retailers' ability to detect holes on shelves and replenish inventory quickly. For many grocers, the only solution is to rotate personnel throughout the store for manual inventory monitoring of out-of-stock, misplaced or

mispriced items. This labor-intensive process typically is conducted intermittently, which forces store management to make real-time decisions based on incomplete and outdated information.

When it comes to planogram compliance, grocers often struggle to maintain item-level productivity through to the next modular change. While many grocers have some form of data collection on out-of-stocks, many are plagued with the lack of visibility into the more important “availability” of inventory on the shelf (OSA) when the customer decides whether to place that item in their basket.

Similarly, capturing data relating to security, hazards, and overall store safety is equally problematic, which highlights another costly problem since grocery stores traditionally incur slip-and-fall claims, even after spending material amounts of labor trying to prevent them. For many retailers, closing data and automation gaps by investing in new IT infrastructures, complex data platforms and retail automation solutions just isn't financially feasible or even doable. Fortunately, a new breed of retail robots is moving quickly beyond warehouse and customer-facing applications to fill critical holes in information relating to inventory and store operations.

### **Bringing Multipurpose Robots to Retail**

In-store autonomous robots can automate critical retail operations while producing meaningful insights to improve operational efficiency, customer experiences and revenues. For example, many of these tasks can be done simultaneously, which dramatically improves labor productivity and significantly increases the speed of relevant information gathering to improve the customer experience.

Badger Technologies' multipurpose robots are equipped with navigation systems, cameras, sensors and software to scan shelves continuously while traversing store aisles safely alongside shoppers and employees. Designed as mobile data collection systems, this rolling infrastructure addresses a plethora of operational issues, including out-of-stock, planogram compliance, and price integrity. The ability to quickly identify and resolve the root causes of inventory and data disconnects is the fastest way for retailers to improve any store's operational execution and financial performance.

Robots can merge collected information from multiple store locations, offering a wider, deeper perspective, while predictive analytics offer both corporatewide and granular business insights. Data feeds, dashboards, and custom reports can be integrated directly with existing store systems to provide far-reaching analysis of how to further reduce operational costs and raise revenue.

Additionally, robots can capture images and information on store security and safety. Hazard detection is a nagging concern for most retailers as the simplest of food or liquid spills can lead to major liability exposure. Aside from their unblinking “shelf's eye view,” robots constantly scan for hazards and provide real-time alerts to improve safety for shoppers and employees while improving audit and compliance operations.

This new generation of versatile, smart robots not only provides a wealth of information to improve store operations, they are also capable of integrating with other IoT and AI systems to connect and share data with refrigeration, lighting, HVAC, and security systems. As a result, the connected store of the future will likely feature a roving robot that makes it easy for retailers to capitalize on data and actionable business analytics to transform operations and shopping experiences.