

Survey of Out-of-Stock Solutions

Solutions	Human Manual Scans (Baseline)	Perpetual Inventory	Non-Camera Shelf Sensors (light, weight, depth)	Shopping Cart Cameras	Robot	Shelf-Mounted Cameras	Drones
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Description	Stockers walk the store 1-3 times a day, scanning all the gaps.	Uses on hand data, calculated by expected receipts from DC and sales, to predict what is in-stock and out-of-stock.	Light, weight or depth sensors on shelves that can alert the store when a void is "sensed".	Attaching cameras to a shopping cart and leveraging your shoppers to collect images of the shelves.	A robot that roams the store at a slow/safe pace and takes very high resolution images of the entire store once or twice a day.	Deployment of small fixed cameras on the shelves to provide real-time monitoring and automated data capture.	Drones that fly in the aisles to collect the imagery or sensor data to identify out-of-stocks SKUs.
Challenges	As wages have increased this solution has become cost prohibitive as it takes several hours a day to audit the full store. Humans are also prone to errors when performing this task.	System is not suitable as an accurate measure of on-shelf availability as inventory counts differ due to difference in receipts from supply chain and shrink. System also does not address product location (back room, sales floor, secondary location). Requires frequent human cycle counts to maintain accuracy.	Requires significant infrastructure investment to support power and connectivity as an individual sensor is needed for every facing. No ability to do product verification.	Low image quality from carts in motion prevent accurate data collection. Requires frequent battery swaps to maintain power to cart mounted device. High rates of theft and/or damage of carts.	Only able to safely perform 1-2 scans a day as robots can't go down aisles that are full of customers. Prevents getting accurate OOS data during stores busiest hours which is when retailers need that data the most. Very expensive solution given the cost of the robot.	Need to provide power to the shelf or swap batteries every 6 months.	Very complex solution to manage as drones can only safely be run when customers are not in the aisle. Battery life of drone only enables scanning of 1-2 aisles per charge. Expensive solution to support due to costs of drone, high end cameras to capture images while in motion and charging stations.
Benefit of automated real time OOS	\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$ \$\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$
Benefit of low shelf stock detection	\$	\$	\$	\$	\$	\$	\$
Benefit of planogram compliance and messy shelf tracking	\$	n/a	n/a	\$	\$	\$	\$
Benefit of price integrity	\$	n/a	n/a	\$	\$	\$	\$
Benefit of stocker performance metrics	n/a	n/a	\$	n/a	n/a	\$	n/a
Benefit of promotion compliance	\$	n/a	n/a	\$	\$	\$	\$
Benefit of e-commerce and advanced merchandising	n/a	n/a	\$	n/a	n/a	\$	n/a
Annual Cost	\$\$\$\$\$	\$\$\$	\$\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$	\$\$\$	\$\$\$\$\$\$\$\$\$\$\$\$
ROI		2	1.2	1.4	2.7	7.8	0.7

\$ = \$20,000