Competitive Landscape: Retail Store-Based Microfulfillment Center Providers for Tier 1 Multichannel Retailers

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Initiatives: Industry Markets and Technologies

Retailers' are accelerating investments in in-store automation. Technology and service providers must demonstrate how their microfulfillment solutions can enable retailers with unified commerce strategies to achieve profitability for e-commerce fulfillment models.

Overview

Key Findings

■ Vendors in this nascent market articulate their competitive differentiation based on their primary technology capabilities. They accentuate either the strong robotics and automation technology elements of their solutions, or they champion their warehouse control and execution systems, coupled with their integration capabilities.

■ Implementations have largely been in the U.S. and have predominantly gravitated toward e-grocery fulfillment, with some vendors' solutions purposefully and solely built for store-based e-grocery fulfillment.

■ Some vendors are starting to emphasize the significant nontechnology elements of the overall solution, such as health and safety ergonomics or development of store associates, which could be powerful competitive differentiators.

■ There are a relatively small number of live implementations, and with further disruption in e-fulfillment models to come, the next 12 to 18 months will see a flurry of vendor activity as this market settles down.

Recommendations

Technology and service providers examining the competitive market landscape for store-based microfulfillment centers (MFCs) as part of retail industry markets and technologies should:

- Gain competitive advantage by building solid segment-specific expertise to demonstrate direct linkage between their solutions and the critical KPIs impacting net margin and profitability. These include capacity management, uptime, inventory availability, order throughput, pick and order accuracy, order consolidation, and human and robot productivity.

- Evaluate the growth projections, as well as the limitations, for the market for fulfillment via automated store-based MFC models. Keep in mind emerging models for nano fulfillment, fully automated supermarkets, and nongrocery retail segments, as well as fulfillment models based on collaboration between retailers.

- Clearly articulate a compelling message by highlighting competitively differentiating factors of your solution that match consumers' values and expectations. These might include high product availability, more convenient delivery options, and your ability to improve store associate experience through attention to health and safety ergonomics, as well as training and accreditation.

- Catch retailers' attention by fostering open-mindedness regarding other vendors in the market to target burgeoning retailer interest in a collaborative scenario in which they deploy multiple vendor solutions in their store estates.

Analysis

Gartner defines MFCs as small footprint semiautomated warehousing facilities installed within, or immediately adjacent to, a retail physical store. Leveraging automation, robotics, AI and real-time data, they are implemented primarily for executing the fulfillment of online demand. Built as automated storage and retrieval systems (ASRS), in a temperature-controlled environment, this type of MFC is created to accommodate high-density storage of products. Semiautomated forms of material handling automation (MHA) are used to retrieve, pick and put away products for consumer orders at high speed. A goods-to-person (GTP) style of automation and robotics is deployed, where the humans stay in one place, and robots bring the goods to them for order picks. The "each picking" style, sometimes known as "piece-picking" is an order-picking process in which a single item or SKU is picked from a master carton. These picks are typically bundled or packaged with other SKUs before being shipped. The GTP style can also be augmented with robotic arm pickers. Store-based MFCs are usually operated as part of a hybrid portfolio of fulfillment execution models, which could also include traditional warehouses, distribution centers, customer fulfillment centers and dark stores.

Consumers Are Driving Retailers to the Least Profitable Channel

Consumers' expeditious shift to digital commerce is driving retailers to their least profitable channel. Exacerbated during the pandemic, consumers generated unprecedented demand for convenient online fulfillment choices such as buy online, pickup in store (BOPIS) or buy online, pickup at curbside (BOPAC). Additionally, the Amazon effect has raised consumers' expectations for same-day and shorter delivery options, for example 60-minute delivery. At the same time, high churn rates and the need to comply with statutory minimum wage requirements mean that the cost of in-store labor is escalating. Moreover, reduced in-store footfall, combined with the explosion of online purchases, is leading to aggressive competition for costly warehouse space. These heavy cost drivers are negatively impacting retail KPIs such as net margin.

This presents a very timely opportunity for vendors to offer store-based MFCs to enable retailers to implement these solutions to reduce unprofitable e-commerce fulfillment transactions. Compelling reasons to do so include the following:
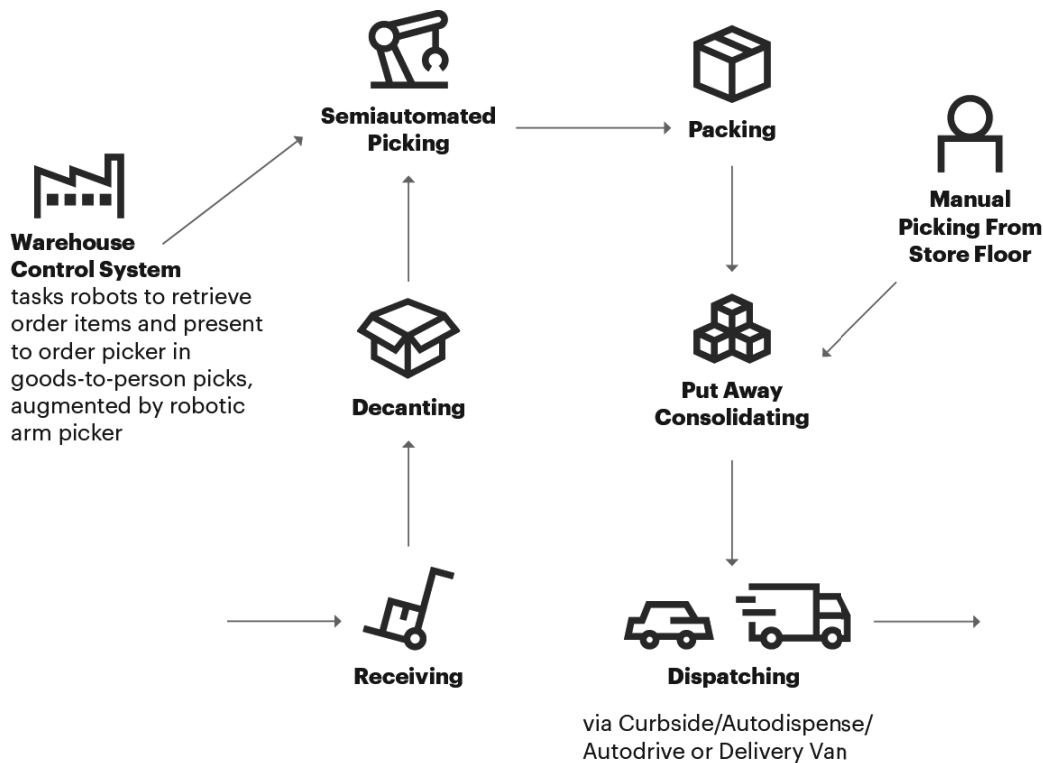
- Automated storage and retrieval systems can be installed in underutilized store space, on average, in around 16 to 25 weeks for a 20,000 sq. ft. facility. They can be set up to fulfill around 90% of the typical grocery basket, with around 10% of remaining products, for example, frozen items, being picked from the store.

- Handling inventory as close to the customer as possible will speed up delivery times and reduce last-mile costs, particularly when deployed, for example, with BOPAC.

- Staff reductions or reallocations to other tasks will reduce a large percentage of order fulfillment costs. Additionally, shoppers will not have to put up with in-store pickers clogging up the aisles.

- Increased throughput and improved order accuracy are solid revenue drivers.

Figure 1 highlights the key processes handled in store-based microfulfillment centers as they must pick, pack, consolidate and dispatch orders.

Figure 1: Key Processes in Store-Based Microfulfillment Centers

Key Order Management Processes in Store-Based Microfulfillment Centers

Warehouse Control System tasks robots to retrieve order items and present to order picker in goods-to-person picks, augmented by robotic arm picker

Semiautomated Picking

Packing

Manual Picking From Store Floor

Decanting

Put Away Consolidating

Receiving

Dispatching
via Curbside/Autodispense/ Autodrive or Delivery Van
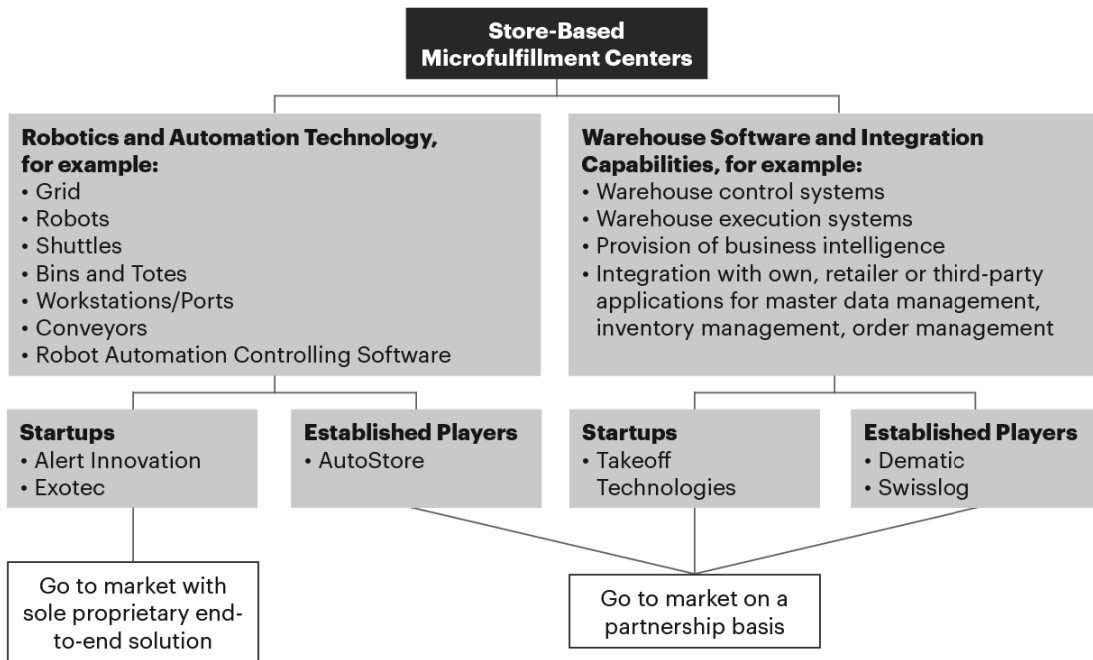
Source: Gartner
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Gartner

Competitive Situation and Trends

Over the past 24 months, an urgent need to tackle the profitability of e-commerce fulfillment has led to a variety of vendors from diverse backgrounds entering the market (see Figure 2)

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Figure 2: Competitive Trend by Primary Go-To-Market Technology Capability

Competitive Trend by Primary Go-To-Market Technology Capability

Source: Gartner
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Gartner

Entrants in this market include startups, as well as established traditional warehouse management vendors of all sizes who have repurposed their solutions to fit the remodeled role of the store as the hub of unified commerce.

Primary implementations have focused on e-grocery fulfillment as consumer demands and complex requirements in this model have eaten heavily into profit margins. Most of the current production implementations are in the U.S. grocery segment.

There are several ways to segment the MFC market, including heritage, go-to-market, technology capability, geographic presence or segment-specific attention. Vendors included in this note have verifiable production implementations of store-based MFCs in large Tier 1 multichannel retailers.

The Tier 1 market consists of large, global retailers that conduct business in multiple geographies. They operate extensive store real estate as one of many operating channels and touchpoints, and generate retail revenue of at least $3 billion per year.

Future for This Market

The debate on whether to fulfill centrally or locally is still hot, and this market is experiencing a number of trials with additional implementations in the offing. There is other automation to come, for example, shifting to more automated robot picking and use of drones for delivery. We also expect a move toward stores specifically architectured and constructed with store-based MFCs in mind.

There is also more disruption coming. We envisage the grocery sector will lead with emerging business models for e-fulfillment. These models include hub and spoke models, smaller "vending" type customer-facing solutions, even smaller footprint "nano'" MFCs, fully automated experiential supermarkets and increased collaboration among retailers and "near neighbor" retailing sectors such as quick service restaurants. As a result, we expect more vendors to enter this market in the next 12 to 18 months, and we could see some M&A activity as it settles down.

Regardless of heritage, the major way in which vendors compete in this market is by leaning on the primary technology capabilities of their go-to-market solution. There are currently three major competitive trends.

Vendors Compete by Accentuating Their Robotics Technology Expertise or Their Warehouse Control and Execution Software, Coupled With Integration Capabilities

Robotics and Automation Technology

Vendors: Alert Innovation, Exotec Solutions and AutoStore

Primary components of the technology include:

Grid/Frame — This is a modular storage framework with standardized components. Robots and shuttles move in and around the grid to retrieve order items that have been decanted into storage containers. The grid usually also has a dedicated service area for robot maintenance and repair.

Robots — There are many types of robots, including ones that move in an x/y plane, omnidirectional "climbing" robots, ground robots and lift robots. They can work 24/7 and have different methods for charging, including using batteries or supercapacitors. Robots are continuously assigned tasks, usually ones that are in closest proximity to them, with optimized routes to save time and energy. Some robots have AI engineered into their design.

Shuttles — These are computer-controlled autonomous moving vehicles (sometimes called bots) that run on a rack structure and are deployed to put away, store and retrieve goods, cases, totes, trays or pallets.

Bins and Totes — These are containers holding the order items that are handled by the robots. Bins are usually larger and contain items picked by the operators. Picked items are put into totes, which usually contain the completed order. Bins and totes can be made of many different materials and in different heights.

Workstations/Ports — These are the areas used by the operators for decanting or picking the goods and are the primary interface between the operator and the MFC system. Robots bring the bins with the goods for the picks and bring the totes for order infill. The robots also remove the bins and totes with completed orders.

Conveyors — These can be configured in various ways to suit different types of workstations.

Robot controller system — This is networked to the grid. It controls the automation of robots, including planning, scheduling and assigning robot tasks, robot traffic management, and keeping track of bin, tote and robot positions in real time.

Note that in the smaller footprint MFC implementations, moving shelves, cranes and other heavy hardware found in industrialized warehousing facilities are not usually needed.

Warehouse Control and Execution Systems and Integration Capabilities

Vendors: Dematic, Swisslog, Takeoff

MFC software is sometimes referred to as the "brains" of the solution and in store-based MFC implementations, this includes:

- Warehouse control system (WCS) functionality for controlling hardware such as conveyors

- Warehouse execution system (WES) functionality for automating and optimizing the management and direction of physical processes in the MFC, such as order picking and packing

- Analytics and business intelligence capabilities through cockpits, operational dashboards and actionable mobile alerts

Integration capabilities: In this scenario, integration between what's happening on the store floor and in upstream systems is very important. Any downtime due to integration issues can be costly. Capabilities include core integration to the retailer's own and/or third-party systems such as master data management (MDM), inventory management, order management and ERP. In some cases, standard interfaces are used to connect to any ERP, and preconfigured interfaces are used to accelerate implementation for specific ERPs.

Honorable mention:

In addition to the vendors profiled in this note, one vendor to keep an eye on is Fabric. This vendor exhibits the competitive trends in this note but it currently does not have in-store or store-based MFC implementations in production, like the vendors we profile later in this document. Live in-store deployments are expected in 2022.

In-Store E-Grocery Fulfillment With Some Vendors' Solutions Built Purposefully to Solely Target This Segment

By 2023, two Tier 1 global food retailers will have acquired vertical farming vendors to satisfy increasing consumer demand for sustainable, high-quality fresh produce.

The grocery e-fulfillment model is inherently not profitable. The complex and cost-bearing requirements in a segment that already operates on razor-thin margins renders the model vulnerable to small shifts. The pandemic induced a shift toward online demand, which yielded record-high grocery revenue. However, the costs of delivering the customer proposition, for example, of high-quality conveniently accessible fresh items, have not been able to offset the huge costs. This is causing net margins to be seriously impacted, resulting in negative profitability for grocery categories. Retailers need a comprehensive, cost-effective turnkey solution to go some way toward redressing the "no profitability" challenge.

The vendors in this note all take into account the aggregative impact of a wide range of parameters such as large SKU ranges and assortments and attributes of items. Attributes can encompass:

- Sizes, shapes and catch weights

- Suitability for picking through the MFC

- Product availability

- Shelf life

- Product expiration dates, particularly for fresh items

- Number of days on hand

- Order size

- Replenishment cycles

- End-to-end order orchestration from ingestion to completed orders, including picking and packing

- Consolidation with manual picks (for example for frozen items)

- Substitution

- Prepicking

- Put-away and storage

- Operator picking schedules

- Delivery Schedules

- "Last mile" options

All vendors have temperature-controlled zones for ambient and chilled. Some can also accommodate frozen zones. Specifically:

- Alert Innovation's solution is purpose-built solely for grocery. There are many slow-moving items in grocery, and rather than having a high grid, the framework is wide and shallow to accommodate a smoother throughput for both slow and fast-moving items. The solution can accommodate ambient, chilled and frozen products.

- AutoStore/Dematic and AutoStore/Swisslog and AutoStore — Dematic and Swisslog have repurposed their industrial warehousing application capabilities to suit smaller in-store footprints in food and nonfood segments. Initial implementations are in the in-store grocery segment in partnership with AutoStore, whose ultra-high-density grid has the advantage of enabling more effective control over expiration dates to reduce waste of perishable products. It can also accommodate large quantities of fresh products such as fruits and vegetables with minimal food degradation. AutoStore's partnership with Dematic can accommodate ambient, chilled and frozen products.

- Exotec targets food and nonfood segments. However, its store-based MFC implementations are limited to grocery retailers.

- Takeoff focuses squarely on the grocery sector. It competes through an exclusive strategic partnership with automated warehouse solutions firm KNAPP, leveraging its shuttle-based solution. Its partnership with Hussmann, a leading refrigeration systems supplier, brings expertise in refrigeration, and this has yielded ambient, chilled and frozen totes, which can all be placed into the same locker.

Focus on the Competitively Differentiating Nontechnology Elements That Tap Into Consumers' Values

Vendors are starting to tap into consumers' values-driven consumption. This speaks to a growing and tangible consumer trend in which people are reevaluating and reprioritizing their values in line with a steady move away from pure consumerism and toward values-based, purpose-driven spending (see Top Trends in Retail Digital Transformation and Innovation for 2021).

Healthier lifestyles, buying more local assortments, interest in sustainable and green products, prudent energy management, focus on waste reduction, ethical sourcing, ergonomic design, fairness and protection of employees, and very importantly, transparency for trustworthiness, are all becoming major customer "asks."

Vendors articulate their solutions' operational performance in the form of metrics such as solution uptime availability of up to at least 99.5%, order picks at the rate of 600 to 800 units per hour, order-picking accuracy between 99 and 99.9% and cost per basket. However, these operational metrics are fast becoming commoditized, so real differentiation will have to come from more strategic capabilities. Some vendors have already started to focus on these types of nontechnology elements such as sustainability, but there is much more room for thought leadership as a competitive differentiator. Some examples include:

- Alert Innovation — Alert Innovation Academy provides training and career development for retail associates, managers and third-party service providers, including architects, covering topics like safety, basic operation, troubleshooting, preventive maintenance, overall system management and detailed servicing for experts. Alert has already developed 40 interactive courses for online training and certification/recertification for associates working in the MFCs. It is also providing a career path in robotics technology, as well as management of the system and plans to open a 24/7 training center by the end of the year.

- AutoStore/Dematic and AutoStore/Swisslog and AutoStore — To some extent, Dematic and Swisslog "piggyback" on AutoStore's explicit focus on sustainability. They use minimal power in their installations, and their recharging robots have regenerative energy functions capable of returning power back to their batteries whenever they decrease their speeds or lower bins. Moreover, the energy-saving robots can work 24/7 in complete darkness.

- Exotec also highlights the lower energy consumption by its multidirectional robots. The company states that its solution has an 80% lower energy footprint compared to traditional automated solutions.

Competitive Profiles

Vendors included in this research have:

1. Viable and commercially available solutions specifically targeted at store-based multifulfillment centers. They can go to market with a full end-to-end solution or with partners.

2. They have had verifiable production implementations installed in large Tier 1 multichannel retailers since January 2020.

Alert Innovation

Product or Portfolio Overview

Founded in 2014, Alert Innovation is headquartered in Massachusetts in the U.S. and is a startup entrant in the store-based automated e-grocery fulfillment market. Its proprietary ASRS "Alphabot" system's features include:

- Omnidirectional Alphabot "climbing" robots

- Three temperature zones and an inventory and order storage grid

- Input/output workstations

- Totes and subtotes

- Order-picking workstations

The vendor's warehouse execution system controls the Alphabot system's operations and has the capability to integrate with retailers' systems through APIs. Functionality also includes an auto dispense portal, where shoppers can self-serve and pick up their e-grocery orders with associate support.

How This Provider Competes

This vendor currently competes only in the grocery segment. It goes to market with its own end-to-end solution, using its own in-house team of experts for sales, distribution, design, installation and maintenance/services, in conjunction with third-party architects, installers and service organizations.

A key competitive differentiator is the patented 3D omnidirectional autonomous robots, which can move in the x-y plane, as well as "climb" vertically. The climbing nature of the robots allows the Alphabot system to configure the storage structure to accommodate workstations on multiple vertical tiers to boost order output levels. These robots are the only moving part in the proprietary Alphabot system, thus obviating the need for hardware such as cranes and conveyors. The robots are continuously charged through supercapacitors, rather than batteries, with the aim of maximizing system availability and safety.

Another competitive differentiator is the founder's years of grocery supply chain experience in automation and engineering. This has brought fundamental input into the design of the solution, which has been purposefully architected from the ground up for "soup to nuts" fulfillment execution of "fresh" grocery online orders through a smaller footprint facility in a store-based environment. Alphabot works with architects on the design of options for spatial configuration of the MFC installation inside the store.

Worth noting is the capability for ambient, chilled and frozen items to be picked through the solution. Completed orders are stored in their respective temperature zones for cold-chain compliance and product quality. Multi tote temperature zone orders are automatically consolidated and dispensed by the robots.

Very importantly, a key nontechnology differentiator is the Alert Innovation Academy, which provides learning opportunities and certifications to encourage careers in robotics technology, as well as management of the MFC systems.

Implementation Sweet Spot: In-store grocery environment, up to 20,000 sq. ft.

Client Reference: Walmart, U.S.

AutoStore

AutoStore is a robot technology company founded in 1996. Partly owned by SoftBank Group, AutoStore is headquartered in Nedre Vats, Norway, with offices in the U.S., the U.K., Germany, France, Japan and Poland.

Product or Portfolio Overview

The major components of AutoStore's cube ASRS are the:

- Grid — Aluminum 3D cube-shaped grid with modular standardized components

- Robots — Two types of self-diagnosing energy-efficient robots that can move in an x-y plane via tracks at the top of the grid and work 24/7

- Storage bins — Specially designed durable and stackable containers, made of different materials and of different heights

- AutoStore Control System (ACS) — Command center of AutoStore for robot task assignment, robot traffic management, alerts, logging bin and robot positions in real time, and providing network connectivity to the grid

- Ports — Ergonomic ports of different configurations, serving as the interface between the operator and the AutoStore system

How This Provider Competes

AutoStore goes to market with Swisslog and Dematic, its partners for the MFC WES/WCS application and integration software, as well as sales, distribution, design, installation and maintenance/services.

Coming from a traditional background of compact warehouse installations, this vendor's store-based fulfillment execution solution is a natural extension of those well-established capabilities. Its

competitive position in this market leans on its well-noted ultra-high-density cube storage grid/framework. This enables significant reduction of storage space, compared to the large amount of space taken up by items on traditional aisles and shelves in a "flat" horizontal layout. Thus, the cube grid can take in more SKUs and deal more effectively with expiration dates, as well as yield higher throughput.

AutoStore's sustainability credentials, called out explicitly in its go-to-market approach, are also a competitive differentiator. Its ACS robot controller application directs energy-saving recharging "green" robots to optimize tasks and provide improvements in labor productivity. The robots can also save energy by working in the dark.

All the software integration and order orchestration for store-based MFCs are provided by the WES functionality of Swisslog's SynQ platform or Dematic's iQ warehouse execution platform.

Implementation Sweet Spot: Store-based grocery environment, up to 20,000 sq. ft.

Client References: H-E-B, Ahold Delhaize U.S.

Dematic

Dematic is a 200-year-old U.S.-based automation veteran with a strong presence in the warehouse management arena. It is part of the KION Group.

Product or Portfolio Overview

Dematic's software platform, Dematic iQ, includes modular products that flex, scale and work together for smarter MFC management and include:

- Dematic iQ Optimise — A WES that enables the MFC to operate at peak performance with the elevated workflow efficiencies provided by on-demand fulfillment strategies and distribution science methodologies

- Dematic InSights — A smart, cloud-based operations optimization and condition monitoring platform that unifies all operational, maintenance and equipment data within the facility

- Dematic iQ Virtual — A facility emulation and simulation platform that digitally models the impact of software or operational changes to prepare for future scenarios without negatively affecting day-to-day operations

- Dematic iQ Workflow — A process execution platform that works with warehouse software systems to allow workers to execute manual business processes through a wide variety of voice and display-based mobile devices

- Dematic Click & Collect — Allows the orchestration of orders from MFC to pick-up centers and remote locations

The software also provides integration capabilities to retailer and third-party systems.

How This Provider Competes

Although it has a comprehensive portfolio of industrial-sized products for heavy-duty warehouse management, Dematic competes in this store-based smaller footprint market through its partnership with AutoStore.

Its competitive differentiator in this market is its years of experience in WMS and WES software and its ability to refactor some of its operational capability deployed in centralized distribution centers (DCs) into a more compact store environment. It has done this by repurposing its industrialized WMS capability to optimize the underutilized space in the store

While other vendors plug into a retailer's WMS or ERP system, Dematic differentiates its solution by offering its native order management capability to ingest orders, parse them to the appropriate picking styles (i.e., in the store-based MFC, for manual picks on the store floor) and provide end-to-end orchestration of the order until it is completed.

Another competitive differentiator is its sheer size and global reach, which means that it can scale up and provide support to implementations in many geographies quicker than others. For example, it already has implementations in three different countries.

It's heavy-duty warehouse management and software experience is complemented by AutoStore's robot technology and automation experience in more compact store environments.

Implementation Sweet Spot: Store-based retail and grocery environment, up to 30,000 sq. ft.

Client References: Amazon, Meijer, Walmart.

Exotec Solutions

Exotec Solutions is a French global robotics startup, created in 2015 by two robotics engineers and headquartered in Lille, France.

Product or Portfolio Overview

The company builds technology for warehouse scalability with automation to improve operational efficiency and economics.

The main component of Exotec's store-based MFC solution is the Skypod System, which consists of:

- A grid with passive racks.

- Skypod robots — A light robot, with a carrying capacity of 30 kg. It can move in all directions and reach a height of 12 meters and can operate in environments above 0 degrees Celsius.

- Bins/Tray — The bins are available in two heights with several options for partitioning. The tray can be adapted to Skypod robots.

- Stations — The stations feature both pick-to-light and put-to-light to prevent picking errors.

- Skypicker — This robotic arm can pick more picks per hour than a human operator.

- Astar WCS software uses advanced algorithms to orchestrate robots, humans, bins and the processes for picking ambient and chilled orders.

How This Provider Competes

Exotec competes for any retail segment in this market with its end-to-end Skypod ASRS proprietary solution.

The company's key competitive differentiator in the market is its capability to scale automation with a light infrastructure robotics-led collaboration between humans and robots to deliver sustainable warehouse productivity. At a pick-station, an operator can achieve up to 500 picks per hour and fulfill four orders at the same time.

The vendor places strong emphasis on its low-energy-consuming multidirectional algorithm-based Skypod "climbing" robots, which are produced in its own factory. The Skypicker is a fully automated picking solution with a revolutionary picking learning algorithm that enables it to detect picking points without human configuration. The Skypicker can achieve up to 600 picks per hour and fulfill four orders at the same time.

Exotec's R&D capabilities rely on its cohort of highly skilled R&D robotics engineers. It's also worth noting its auto delivery capability. The automated delivery system can provide high-density buffering of orders and deliver them directly to the trunk of a car in around two minutes to improve the customer experience.

Implementation Sweet Spot: Store-based grocery environment, up to 15,000 sq. ft.

Client References: Carrefour, E.Leclerc

Swisslog

A global company headquartered in Buchs/Aarau, Switzerland, Swisslog is a well-established logistics automation company and has been in business since 1900, focusing on automation technology — it's core business today — since the 1980s.

Product or Portfolio Overview

Modular and cloud-enabled, Swisslog's SynQ software platform handles warehouse management, warehouse execution, material flow and automation control functionality and includes an array of business intelligence tools in a single platform. It offers flexible deployment of only the modules that are needed, while enabling synchronization of automation infrastructure, robotics, people and processes. SynQ's functionality, services and supporting processes provide the following for this solution:

- WES functionality for execution of online fulfillment and comes with an operational dashboard

- Supports the physical processes conducted in the MFC for order fulfillment processes such as order picking, replenishment, order consolidation and staging, as well as support for label printing and packing, and it coordinates with last-mile software

- Business intelligence capabilities through a cockpit manager, mobile notifications for corrective action and availability management to minimize downtime

- Integration to retailer and third-party systems with standard interfaces used to connect to any ERP and other WMS systems

How This Provider Competes

Swisslog has all the hardware, robotics, software and automation technology needed for industrial-sized warehouse management. However, in the specific market for online fulfillment through in-store MFCs, it competes through an strategic partnership with AutoStore, pairing its SynQ platform's WES functionality with AutoStore's high-density cube ASRS, robots and robot controller technology.

It's competitive differentiator is the high degree of experience, standardization and modularity of its software, making it very easy to configure to suit the requirements of different types of microfulfillment solutions, for example, for varying SKU requirements or integration needs.

It's a good match with AutoStore, as modularity and standardization are also key features of AutoStore's cube ASRS solution. Moreover, the SynQ software can be used for strategic enhancements, for example, to extend the AutoStore Grid or add other hardware such as conveyor technology or for augmenting human picking capability with ItemPiQ (KUKA) robot pickers.

Implementation Sweet Spot: Store-based grocery environment

Client References: H-E-B, Ahold Delhaize U.S.

Takeoff Technologies

Started up in 2016 by two experienced grocery executives, Takeoff Technologies is headquartered in Massachusetts, in the U.S.

Product or Portfolio Overview

Takeoff offers a turnkey end-to-end technology solution for e-grocery, for which it partners with warehouse automation provider KNAPP for the material-handling automation component. The vendor's software provides the following:

- User interface — Takeoff's solution can tie into the customers' mobile apps through which orders are placed with retailers. Takeoff's assortment system powers the app to help customers find products easily.

- Fulfillment — End-to-end control of the microfulfillment semi-automated picking process through integration with KNAPP's automation and shuttle technology, as well as the retailer's own applications.

- Routing — Support for a hub and spoke model.

- Replenishment — Replenishment options to order the right quantity of the right products.

- Pickup and delivery options.

How This Provider Competes

Takeoff's shuttle based ASRS solution is dedicated solely to in-store hyperlocal e-grocery fulfillment. It has deployed a second-generation design of KNAPP's OSR shuttle Evo for use as both a storage and a picking system. The system touts a modular design and a scalable number of shuttles to optimize use of space in the implementation.

Takeoff provides the core warehouse execution and orchestration software, as well as integration capabilities, and also handles replenishment of assortment into the MFC. It goes to market with its own in-house team of experts for sales, distribution, design, installation and maintenance services.

The major competitive advantage that Takeoff brings to this specific market is its grocery knowledge. The solution has been constructed by grocers for a grocery supermarket environment — a particular solution to a particularly complex problem of improving the profitability of grocery e-fulfillment.

Partnering with Hussmann offers a competitive differentiator, as it has direct access to automated locker systems designed to regulate safe product temperature control, for example, for refrigerated and frozen items. This is to ensure the integrity of food while it is being handled.

In addition to the use of OSR systems, the company is also deploying open shuttle systems that can be loaded to dollies and directly to trucks or automated lockers to automate the last mile.

Another differentiator is the time and resources the company invests with retailers on the HR models for store associates, and in identifying strategies to improve pick rates and productivity through training and incentives.

Implementation Sweet Spot: Store-based grocery retail

Client reference: Albertsons, Woolworths, Safeway

References and Methodology

This research is based on existing Gartner research, complemented by secondary research surveys conducted by Gartner's Secondary Research Services team. Interviews were also conducted with leading MFC providers during the summer of 2021. Finally, a vendor fact review was conducted with the leading MFC providers to validate the accuracy of the relevant data.

Recommended by the Authors

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