

IDC MarketScape

IDC MarketScape: Worldwide Autonomous Mobile Robots for General Warehouse Automation 2019 Vendor Assessment

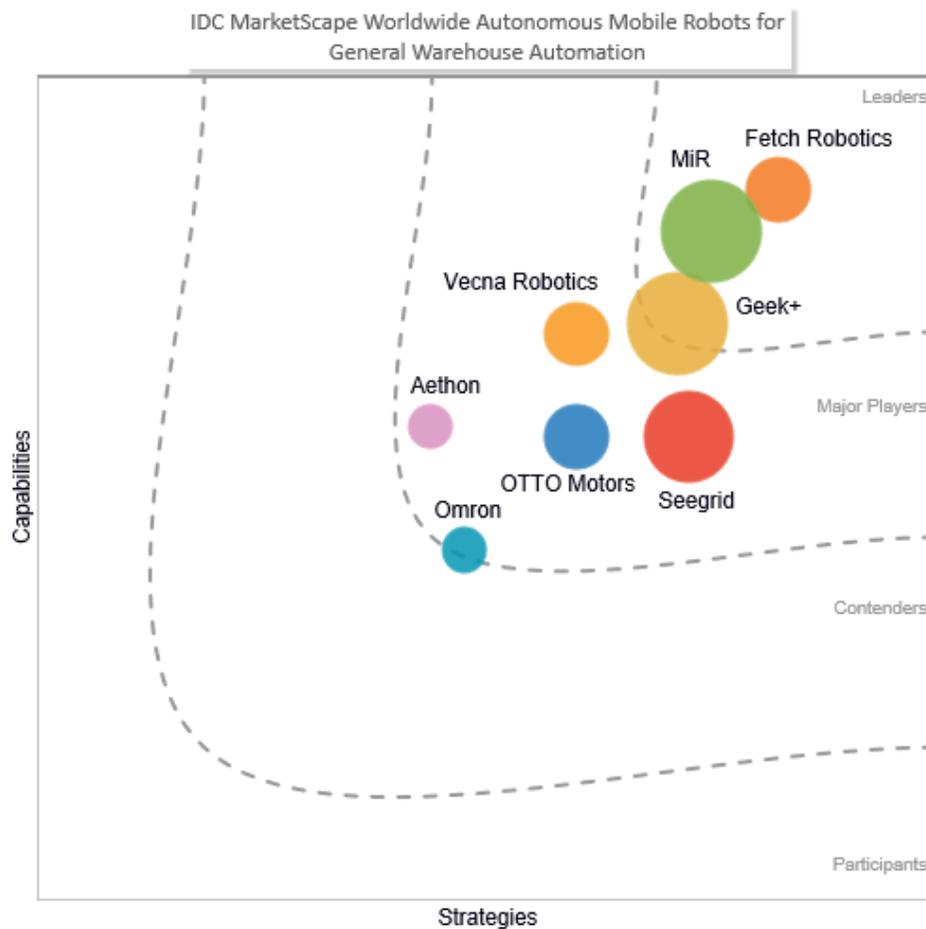
John Santagate

THIS IDC MARKETSCAPE EXCERPT FEATURES FETCH ROBOTICS

IDC MARKETSCAPE FIGURE

FIGURE 1

IDC MarketScape Worldwide Autonomous Mobile Robots for General Warehouse Automation Vendor Assessment



Source: IDC, 2019

Please see the Appendix for detailed methodology, market definition, and scoring criteria.

IN THIS EXCERPT

The content for this excerpt was taken directly from IDC MarketScape: Worldwide Autonomous Mobile Robots for General Warehouse Automation 2019 Vendor Assessment (Doc # US44843019). All or parts of the following sections are included in this excerpt: IDC Opinion, IDC MarketScape Vendor Inclusion Criteria, Essential Guidance, Vendor Summary Profile, Appendix and Learn More. Also included is Figure 1.

IDC OPINION

This IDC document represents the vendor assessment model called IDC MarketScape. This research is a quantitative and qualitative assessment of the characteristics that explain a vendor's success in the marketplace for autonomous mobile robots (AMRs) for general warehouse automation and assesses current and anticipated performance in the marketplace. This document assesses the capability and business strategies of eight key vendors competing in the autonomous mobile robots for general warehouse automation market. This evaluation is based on a comprehensive framework and set of parameters expected to be most conducive to success in providing an effective and efficient approach to autonomous mobile robots for general warehouse automation both in the short term and in the long term. Key findings include:

- This IDC MarketScape represents a snapshot in time. The market for autonomous mobile robots has proven to be quite dynamic, as the barriers to entry with an autonomous mobile robot are rather low from a product development perspective. However, the barriers to success are quite high, and for this reason, it is expected that this landscape will look significantly different in two years, when IDC does a refresh of this study.
- IDC defines autonomous mobile robots for general warehouse automation as autonomous mobile robots with broad movement-related capabilities and built for warehouse operations. This includes pallet movement, carts, movement of shelving and racking, and all other non-fulfillment-specific-related material movement within the warehouse.
- This study lightly considers the use of autonomous mobile robots for the order fulfillment process, however, as this function has been covered in a standalone IDC MarketScape (see *IDC MarketScape: Worldwide Autonomous Mobile Robots for Order Fulfillment 2019 Vendor Assessment*, IDC #US44843119, April 2019), this study only considers fulfillment as a function of portfolio. All other material movement processes and other mobile robot-enabled processes are the primary scope of this study.
- Each vendor included in this IDC MarketScape (Aethon, Fetch, Geek+, MiR, Omron, OTTO, Seegrid, and Vecna Robotics) develops and provides autonomous mobile robots that meet the criteria and enable organizations involved in the business of warehouse operations to automate some element of the movement of materials or other processes within the warehouse.
- Of the eight vendors included in this document, five focus on broad autonomous mobile robotic capabilities for the warehouse, yet do not compete in the space of autonomous mobile robots for fulfillment processes (Aethon, MiR, Omron, OTTO, and Seegrid).
- Of the eight vendors included in this document, three have a broader portfolio of autonomous mobile robotic and other automation technology and provide capabilities for general warehouse automation as well as order fulfillment (Fetch Robotics, Geek+, and Vecna Robotics).

- The criteria used in the IDC MarketScape for autonomous mobile robots for general warehouse automation (and resulting position in Figure 1) are across dual dimensions of strategy (future plans and where the vendor is headed) and capability (where the vendor is today in terms of capabilities). Each of the elements within strategy and capability is then assigned a weighting based on the relative importance of each criterion in the opinion of IDC and feedback from warehouse operators across industries.
- This IDC MarketScape is a starting point for companies that are considering autonomous mobile robots for general warehouse automation. The vendors included represent a "short list" – a way to winnow down the long list of autonomous mobile robot providers that exist in the marketplace. It does not replace the due diligence that companies must then do to evaluate which vendor is the right fit for their particular needs and circumstances.

IDC MARKETSCAPE VENDOR INCLUSION CRITERIA

The market for autonomous mobile robots for general warehouse automation is made up of vendors that have developed robots with the capability of autonomously navigating a warehouse, are equipped to transport a variety of payloads, often have a degree of modularity, and have a software element that allows for robot management and alignment to the business applications responsible for orchestrating the movement of materials, such as warehouse management software (WMS) or warehouse execution system (WES). Specifically, vendors included in this study exhibit the following characteristics:

- Vendors deliver a complete autonomous mobile robot for warehouse operations to the market. Vendors that deliver capabilities that enable autonomous mobility but do not build and sell their own autonomous mobile robot are not considered.
- Autonomous mobile robot vendors for general warehouse automation were considered only if their offering included: a physical robot and a related software platform to support the usage of the robots.
- Vendors were only considered if their robots truly possess the ability to autonomously navigate a facility. Vendors with products that require significant facility/infrastructure (guidewires, magnets, floor-mounted fiducials, etc.) modifications were not considered. The robots must be capable of operating without significant reliance upon infrastructure modifications. Autonomous navigation must enable the robots to quickly and easily extend their operating environment. Some vendors do leverage racking or wall-mounted fiducials, but this is more for location assistance and not a core element in autonomous navigation.
- Vendors considered must support a range of use cases within the broad context of warehouse operations. Those vendors with a product designed explicitly for a specific use case, such as fulfilment, are not considered in this study.

These key characteristics represent the core elements considered for inclusion. Vendors that do not meet these key characteristics are not considered. The intent of this IDC MarketScape is to focus on those notable vendors with their robots deployed in the market and/or a compelling offering in the space with a sound strategy for future growth. Each of the eight vendors in this document meet this requirement.

ADVICE FOR TECHNOLOGY BUYERS

Warehouses come in all shapes, sizes, and with various purpose, yet regardless of the size, shape, or purpose of the warehouse, all of them have some requirement of material movement. The worldwide

market for warehousing space overall is in a period of healthy growth as demand for goods and services worldwide increases alongside increases in global population and strong economies in major markets. However, the growth in warehousing and demand is not being met with an increase in labor availability to support growing requirements in many major markets including the United States, Japan, China, and many parts of Europe. A lack of labor availability is one of the driving forces behind the push to automate warehousing operations with the support of autonomous mobile robots. The use of autonomous mobile robots enables warehouse operations to scale on-demand, redeploy human workers to more valuable tasks, and reduce the risk related to reliance on short-term seasonal labor.

In addition to labor-related challenges, safety is a key element in the movement to leverage autonomous mobile robots for general warehouse automation. For example, according to the United States Department of Labor, Occupational Safety and Health Administration (OSHA), over 11% of forklifts will be involved in an accident. Forklifts are typically used to move and transport pallets within a warehouse. However, the emergence of autonomous mobile robots that are capable of taking on pallet/bulk movements helps reduce the reliance on forklifts for certain movements and will be a major force in improving warehouse-related safety. Autonomous mobile robots are not operated by humans, therefore, the human error element related to such workplace accidents is eliminated. These robots leverage advanced vision systems and sensors to be able to sense and respond, in real time, to their operating environments. Overall, the use of autonomous mobile robots in the warehouse helps improve safety as it introduces automated equipment that is built under strict safety guidelines and designed specifically with improving safety in mind.

Furthermore, many (if not most) organizations are engaged in some degree of digital transformation (DX) and/or modernization efforts. Autonomous mobile robots in the warehouse provide a mechanism to autonomously capture data about the movement of materials and inventory utilization within a warehouse operation. These devices are connected end points performing a task or a series of tasks that can support DX and modernization. In addition, the option of integrating autonomous mobile robotic technology with operations-level systems, such as WMS and WES, can support the alignment between the physical execution of tasks and the digital footprint of the operation.

Last, deploying autonomous mobile robots in the warehouse is something that can be done with little to no disruption to an existing operation. Many of the vendors in this study have developed highly flexible systems that can be deployed into an ongoing operation without the need to change the configuration of a facility or engage in infrastructure change. This last point is probably the most notable, as the warehouse operations market has an abundance of smaller, regional warehouses that typically have little appetite for disrupting an operation to deploy technology and often do not have the capacity to invest in building out new facilities and full-on automation. Autonomous mobile robots enable such operations to deploy "flexible automation," which is not constrained by the layout of a facility, as conveyance and sortation might be. Some vendors in the space are also offering users the option to buy the technology "as a service." The robot-as-a-service model not only reduces the risk associated with using the technology but can also significantly enhance the ability to scale with the dynamic requirements of the modern warehouse, without having to rely on bringing in new labor and instead optimize the capacity and productivity of the existing labor within a facility.

For companies considering or looking to utilize autonomous mobile robots in the warehouse, IDC offers the following guidance:

- Do your due diligence, evaluate the state of the market for vendors, and work with a few candidates to understand how they perceive the value proposition, where they have deployed, and what level of value has been delivered to their customers. Get references.
- Consider autonomous mobile robots as a tool designed to improve the capabilities of your workers. These devices perform a task but do not necessarily do all of the things that your people are capable of.
- Engage your workforce in the process. There is an understandable concern over the use of robots and the impact on employment. Most of the vendors in this study have built robots designed to safely operate around human workers. Be up front with your workforce and take their inputs during the early stages of planning.
- When building out your DX or modernization strategy, think about the value of data relative to the physical execution of the tasks within the warehouse operation. Craft a strategy to improve the data footprint through the use of autonomous mobile robots as a data-generation mechanism.
- Start small. You can start with this technology on a small scale and build from an initial deployment. Autonomous mobile robots for general warehouse automation can be rather quickly deployed in a variety of manners and once the tech is in place, leverage the value to expand the utilization where it makes sense for the organization.
- Overall, this technology is exceptionally user friendly. Do not let preconceived notions about the complexity of the technology get in the way of taking action.

VENDOR SUMMARY PROFILES

This section briefly explains IDC's key observations resulting in a vendor's position in the IDC MarketScape. While every vendor is evaluated against each of the criteria outlined in the Appendix, the description here provides a summary of each vendor's strengths and challenges.

Fetch Robotics

Fetch Robotics is a Leader in the 2019 IDC MarketScape for autonomous mobile robots for general warehouse automation.

Headquartered in San Jose, California, Fetch Robotics produces a wide portfolio of autonomous mobile robots for various uses within the warehouse and factory. The company was founded in 2014 and has grown rapidly since to the point today where the company employs over 135 people and has been through three rounds of funding totaling \$48 million, with its latest B round funding injecting \$25 million into the company in 2017, led by Sway Ventures.

Fetch Robotics was an early mover in the space of cloud robotics, which takes a cloud-centered approach to deploying, managing, optimizing, and integrating robots into warehouse operations. The company has built its robotic platform around its Fetch Cloud Robotics Platform, which enables it to deploy autonomous mobile robots in hours, enabling on-demand automation. One customer reference indicated that it took its Fetch robots out of the box at 9:00 a.m. on a Monday and had the robot operational in workflows by 1:00 p.m. that same afternoon. Fetch Robotics leverages its cloud-driven platform to create a common data architecture designed to drive a simplified approach to robot deployment. Fetch Robotics has a broad portfolio of robotic applications that support a wide range of material movement payloads and data collection (RFID) applications, yet all managed from the common cloud platform. The Fetch model enables the company to handle a wide variety of material

movement processes within the warehouse and manufacturing operations, all on the same management platform.

The broad product portfolio at Fetch allows the company to address a wide variety of needs in a warehouse operation. The product portfolio and direction of continued innovation are positioned by Fetch as "having the ability to deliver on-demand automation for all material movement needs throughout the warehouse." The portfolio is quite robust and actually enables even more than just automated material handling. The product portfolio at Fetch for general warehouse automation includes:

- **VirtualConveyor line.** The VirtualConveyor line of autonomous mobile robots from Fetch delivers a variety of capabilities built upon a common mobile robotic software platform. The line consists of five distinct configurations, three of which are built from a common modular autonomous mobile robotic base:
 - **HMIShelf** is a configurable and customizable autonomous mobile robot with a built-in touchscreen UI capable of handling various configurations of bins, totes, and packages. This robot is configurable to support a wide variety of materials of smaller payload to move material and complete work flows within the warehouse.
 - **CartConnect** is an autonomous mobile robot solution that decouples the Fetch CartConnect robot from its rolling FetchCarts to allow both manual worker use and automated movement.
 - **RollerTop** is an autonomous mobile robot with a roller top capable of integrating with existing conveyance. This robot enables conveyor-to-conveyor transportation, using an autonomous mobile robot with the integrated roller top.
 - **Freight500** is a 500kg payload autonomous mobile robot built for automating the movement of case goods and smaller palletized loads. The robot is 40in. wide and comes with a fast charge feature that allows it to offer 9 hours of continuous operations with a one-hour charge.
 - **Freight1500** is a heavy-duty pallet-moving robot with a maximum payload of 1,500kg. The robot is built for automating the movement and transportation of large pallet-sized payloads. Both the Freight500 and Freight1500 provide 360-degree vision enabled by eight 3D cameras and two LIDAR sensors.
- **DataSurvey – TagSurveyor.** Fetch also offers an autonomous RFID tower called the TagSurveyor, which automates the process of capturing RFID signals throughout the facility to enable digital inventory management.

Each of these products offered by Fetch Robotics is built to support different elements of automation within the warehouse and factory floor, allowing the company to deliver flexible automation capabilities across a wide range of scenarios and environments. One thing that stands out, relative to Fetch Robotics, is that the technology is designed to be able to be deployed without integration into other traditional business systems. This approach enables Fetch to rapidly deploy the technology for its customers, in hours. However, IDC views integrations as a best practice; and while Fetch is helping its customers to get going quickly, organizations must look beyond the immediacy of deployment and develop longer-term implementation strategies in order to get the full value out of their robotic systems. The Fetch platform supports this via software interfaces (APIs, SDK) and hardware interfaces (the FetchLink IoT interface unit) that connect with devices and applications to support highly automated workflows.

Fetch Robotics puts significant emphasis on the value of data. While the company develops autonomous mobile robots that automate material handling tasks in the warehouse, it actually places more emphasis on the value of the data that is generated during the material movement processes. This type of thinking, relative physical and digital product development, allows Fetch to look beyond the task and work to deliver data-driven value for its customers, in addition to task-level automation.

Fetch has a stronger-than-average partner network that it has built out across applications, support, and integrations. The company is partnered with business application vendors and offers pre-integrated solutions with SAP, Softeon (pick to voice), Surgere (inventory management), and Honeywell Intelligrated (pick to voice and pick to light). It is also partnered with MacGregor, Honeywell Intelligrated, Storage Solutions (SSI), Accenture, and other regional partners in North America, Europe, and APAC for implementation and integration services. Finally, Fetch is partnered with Ricoh for services; this helps give Fetch customers access to 24 x 7 worldwide level 1 support.

Strengths

The leadership team at Fetch Robotics is its greatest asset. The company has a strong product portfolio and significant IP in robotics and cloud with a deep patent portfolio, but the vision and execution are something that is hard to replicate. The company has come to market with a range of autonomous mobile robotic products but aligns the development of these products to the vision of Fetch as a data-driven company.

Challenges

The challenge for Fetch, in terms of general warehouse automation, is more around customer engagement than anything. The portfolio allows Fetch to address so many material handling scenarios that the company must engage in strategic analysis and design with its customers in order to find the best opportunities to deploy the technology for new customers. With its portfolio, it is easy to go in and look for all scenarios, rather than to strategically address the most critical opportunities within its customers' facilities.

Consider Fetch Robotics When

Companies looking for an autonomous mobile robotics vendor with a strong product portfolio of autonomous mobile robotics and a future-state-driven vision will find Fetch as a company to consider. Those companies that are looking for a long-term partner across multiple dimensions of material movement automation and a road map for digital transformation will find Fetch as a company with both the ability to deliver in the near term and the vision to deliver on the future-state vision.

APPENDIX

Reading an IDC MarketScape Graph

For the purposes of this analysis, IDC divided potential key measures for success into two primary categories: capabilities and strategies.

Positioning on the y-axis reflects the vendor's current capabilities and menu of services and how well aligned the vendor is to customer needs. The capabilities category focuses on the capabilities of the company and product today, here and now. Under this category, IDC analysts will look at how well a vendor is building/delivering capabilities that enable it to execute its chosen strategy in the market.

Positioning on the x-axis, or strategies axis, indicates how well the vendor's future strategy aligns with what customers will require in three to five years. The strategies category focuses on high-level decisions and underlying assumptions about offerings, customer segments, and business and go-to-market plans for the next three to five years.

The size of the individual vendor markers in the IDC MarketScape represents the market share of each individual vendor within the specific market segment being assessed.

Each of the eight vendors evaluated for this IDC MarketScape provide autonomous mobile robots and the related software applications to enable organizations to automate material movement within broad warehouse operations. All of the vendors evaluated meet the core requirement of having the capacity to deliver autonomous mobile robotic capabilities demanded by the market today. However, approaches to product design, features, functionality, and capabilities vary significantly. While there remain differences among the competitors, IDC would feel comfortable recommending any of these companies for organizations looking to deploy flexible automation in the form of autonomous mobile robots into various aspects of general warehouse operations. However, across this landscape of vendors, capabilities and processes supported vary.

IDC MarketScape Methodology

IDC MarketScape criteria selection, weightings, and vendor scores represent well-researched IDC judgment about the market and specific vendors. IDC analysts tailor the range of standard characteristics by which vendors are measured through structured discussions, surveys, and interviews with market leaders, participants, and end users. Market weightings are based on user interviews, buyer surveys, and the input of IDC experts in each market. IDC analysts base individual vendor scores, and ultimately vendor positions on the IDC MarketScape, on detailed surveys and interviews with the vendors, publicly available information, and end-user experiences in an effort to provide an accurate and consistent assessment of each vendor's characteristics, behavior, and capability.

Market Definition

Autonomous mobile robots for general warehouse automation enable organizations to automate various material movement tasks within a warehouse operation. Warehouse operations plays a key role in supply chain execution, and autonomous mobile robots are a tool to be used to deliver more efficient and effective material movement process execution. The market for autonomous mobile robots for general warehouse automation is not necessarily new, but more recent developments in the technology and market demand has created a significant amount of interest and availability of the technology. Each potential user of the technology will have some unique aspect to their operation, which is helping deliver a market capable of supporting multiple vendors in the space, each with some unique feature, functionality, or design.

Autonomous mobile robots for general warehouse automation represents the broad category of autonomous mobile robots that are enabling warehouse operations to automate material movement-related tasks as well as perform some other movement-related processes within the warehouse. In nonautomated warehouses, these processes are typically performed by human operators, often with the support of some mobile asset such as a forklift. However, the movement of material that does not add value to the product in the eyes of the buyer is considered wasted movement. Leveraging autonomous mobile robots in material movement-related processes does not eliminate the wasted movement; however, it does allow the operation to redeploy human workers to focus on more value-adding tasks. There are several approaches to developing and delivering autonomous mobile robots

for general warehouse automation, with differences including payload, approach to navigation, level of autonomy, degree of modularity, and collaboration capabilities.

The benefits of using this technology extends well beyond the automation of the movement of materials within the process. Vendors providing autonomous mobile robotic technology support the hardware through the use of software applications that not only orchestrate the movements of the fleet but also enable an organization to leverage data about the movement of materials to deliver data-driven improvements to an operation. In addition, beyond the benefits of improved productivity and efficiency, many users of the technology cite improved scalability and flexibility as key benefits realized through the use of autonomous mobile robots within their warehouse operation.

LEARN MORE

Related Research

- *Worldwide Commercial Service Robotics Forecast, 2019-2022* (IDC #US44771619, February 2019)
- *Service Robots and IoT* (IDC #US43174318, December 2018)
- *IDC PlanScape: Building the Business Case for Investment in Service Robotics* (IDC #US42954618, October 2018)
- *IDC MaturityScape Benchmark: Autonomous Mobile Robots in the Warehouse and Fulfillment Center in the United States, 2018* (IDC #US43175218, September 2018)
- *IDC MaturityScape: Autonomous Mobile Robots in the Warehouse and Fulfillment Center 1.0* (IDC #US43175018, July 2018)

Synopsis

This IDC study uses the IDC MarketScape model to provide an assessment of a number of providers participating in the worldwide autonomous mobile robot for general warehouse automation market. The IDC MarketScape is an evaluation based on a comprehensive framework and a set of parameters that assesses providers relative to one another and to those factors expected to be most conducive to success in a given market during both the short term and the long term.

"Autonomous mobile robots are delivering significant benefits to those organizations that have embraced this technology," says John Santagate, research director, Service Robots, IDC. "Vendors in this space have developed technology that is easy to use and cost effective and has proven to deliver rapid results. In addition, organizations that are more advanced in terms of their use of robots are able to create alignment between the physical execution of warehouse operations and the digital elements of the business."

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-community.com
www.idc.com

Copyright and Trademark Notice

This IDC research document was published as part of an IDC continuous intelligence service, providing written research, analyst interactions, telebriefings, and conferences. Visit www.idc.com to learn more about IDC subscription and consulting services. To view a list of IDC offices worldwide, visit www.idc.com/offices. Please contact the IDC Hotline at 800.343.4952, ext. 7988 (or +1.508.988.7988) or sales@idc.com for information on applying the price of this document toward the purchase of an IDC service or for information on additional copies or web rights. IDC and IDC MarketScape are trademarks of International Data Group, Inc.

Copyright 2019 IDC. Reproduction is forbidden unless authorized. All rights reserved.

