

IDC MarketScape

IDC MarketScape: Worldwide Autonomous Mobile Robots for Order Fulfillment 2019 Vendor Assessment

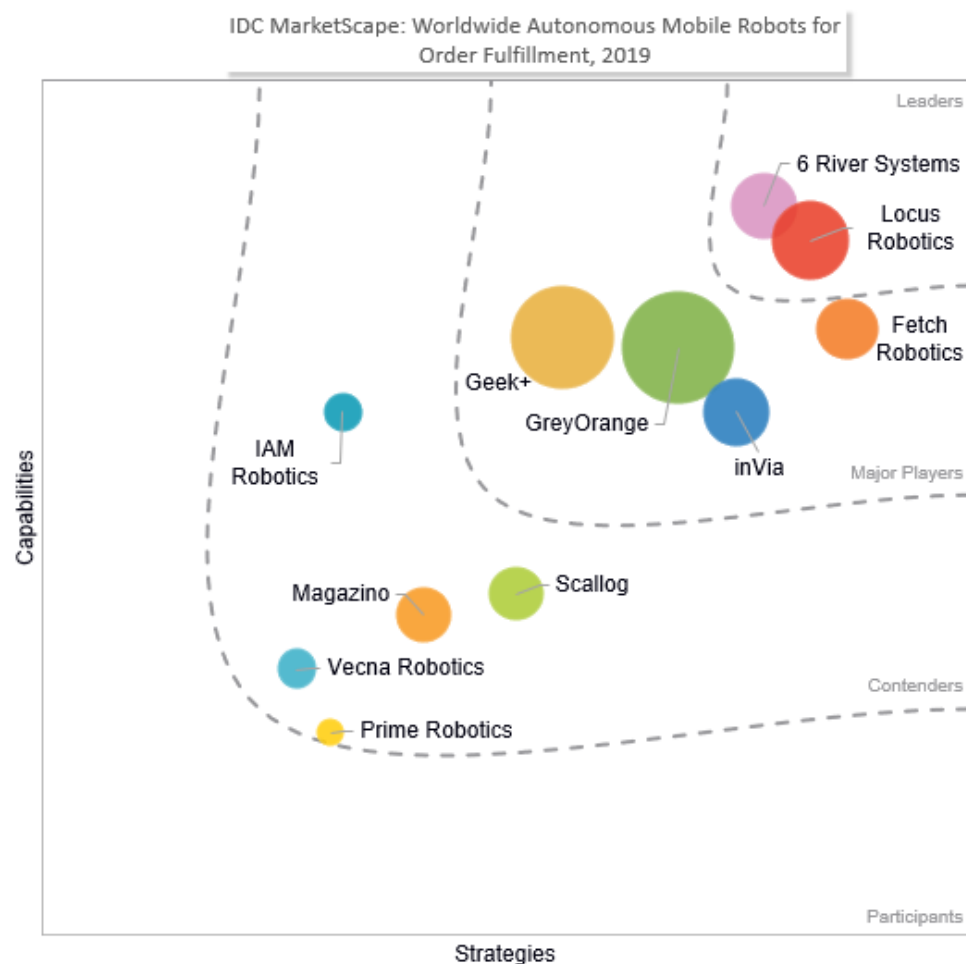
John Santagate

THIS IDC MARKETSCOPE EXCERPT FEATURES: 6 RIVER SYSTEMS

IDC MARKETSCOPE FIGURE

FIGURE 1

IDC MarketScape Worldwide Autonomous Mobile Robots for Order Fulfillment 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 Order Fulfillment 2019 Vendor Assessment (Doc #US44843119). 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 for the fulfillment process and assesses current and anticipated performance in the marketplace. This document assesses the capability and business strategies of 11 key vendors competing in the autonomous mobile robots for order fulfillment 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 fulfillment 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 fulfillment as those autonomous mobile robotic devices with the capability to support the order fulfillment process by taking on some element of movement throughout the processes of picking orders within ecommerce, retail, and other order fulfillment environments.
- Each vendor included in this IDC MarketScape (6 River Systems, Fetch Robotics, Geek+, GreyOrange, IAM Robotics, inVia, Locus Robotics, Magazino, Prime Robotics, Scallog, and Vecna Robotics) develops and provides autonomous mobile robots that meet the criteria and enable organizations involved in the business of order fulfillment to automate some element of the movement of goods throughout this process.
- Of the 11 vendors included in this document, 7 focus exclusively on delivering autonomous mobile robots for the fulfillment process (6 River Systems, IAM Robotics, inVia, Locus Robotics, Magazino, Prime Robotics, and Scallog).
- Of the 11 vendors included in this document, 4 have a broader portfolio of autonomous mobile robotic and other automation technology and provide capabilities for order fulfillment, but they are also capable of providing autonomous mobile robots for other material movement processes beyond order fulfillment (Fetch Robotics, Geek+, GreyOrange, and Vecna Robotics).
- The criteria used in the IDC MarketScape for autonomous mobile robots for order fulfillment (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 retailers, ecommerce fulfillment operations, third-party logistics (3PL), and others involved in the fulfillment business.

- This IDC MarketScape is a starting point for companies that are considering autonomous mobile robots for fulfillment. 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

Autonomous mobile robots for fulfillment are designed to support the order fulfillment process by taking on tasks related to material movement throughout the process. These movements have traditionally been performed by human workers in a facility, yet the movement of material that does not add value to the product in the eyes of the buyer is considered wasted movement. There are several approaches to developing and delivering autonomous mobile robots in the fulfillment process, with different degrees of collaboration and interaction with human workers required.

The benefits of using this technology extend 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 fulfillment operation.

The market for autonomous mobile robots for the fulfillment process is made up of vendors that have developed robots with the capability of autonomously navigating a fulfillment center, are equipped to transport a payload consistent with order fulfillment, and have a software element that allows for robot management and alignment to the business applications responsible for orchestrating the fulfillment process, such as warehouse management system (WMS). These are the core elements considered for inclusion. The intent of this IDC MarketScape is to focus on those notable vendors with their robots deployed in the market and/or have a compelling offering in the space with a sound strategy for future growth. Each of the 11 vendors evaluated in this document meet this requirement.

ADVICE FOR TECHNOLOGY BUYERS

The order fulfillment process, for most operations, has been a very manual process marred with an abundance of nonvalue-adding movement of materials throughout the process. The market for order fulfillment, in general, is growing rapidly as ecommerce continues to grow, retailers invest in building omni-channel fulfillment capabilities, and manufacturers engage in direct-to-consumer fulfillment. Growth in these markets is fueling the desire for operators of facilities engaged in order fulfillment to look for ways to reduce waste, improve productivity, improve efficiency, increase scalability and flexibility, and mitigate the risks of labor uncertainty. These forces are driving buyers to look at flexible automation technologies that can be deployed to reduce the need for workers to walk long distances or complete repetitive and monotonous tasks, which enables humans to focus on performing tasks that humans are better at than robotic and automation technologies.

Furthermore, many (if not most) organizations are engaged in some degree of digital transformation (DX) and/or modernization efforts. Autonomous mobile robots in the fulfillment process provide a mechanism to autonomously capture data about the movement of materials and inventory utilization within a fulfillment 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, can support the alignment between the physical execution of tasks and the digital footprint of the operation.

Last, deploying autonomous mobile robots in the fulfillment process 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 market for order fulfillment has an abundance of smaller, regional fulfillment centers 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 (RaaS) model not only reduces the risk associated with using the technology but can also significantly enhance the ability to scale for short-term spikes in demand, such as seasonal spikes, 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 for order fulfillment, 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.
- Each vendor has its own methodologies and processes for how it enables the order fulfillment process. Assess how different vendors work in different scenarios and align their models to your processes to find a best fit option for your operation.
- 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 interact with 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 fulfillment process. Craft a strategy to improve the data footprint through the use of autonomous mobile robots as a data-generation mechanism.
- While integration is considered a best practice, it is not a requirement to deploy this technology. Craft a deployment strategy that aligns to the needs and constraints of your organization. You can start with this technology on a small scale and build from an initial deployment.
- 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.

6 River Systems

6 River Systems is positioned as a Leader in the 2019 IDC MarketScape for autonomous mobile robots for order fulfillment.

6 River Systems is a company focused on producing automation and fulfillment systems for ecommerce, retail, B2B, and third-party logistics operations. The company, headquartered in Waltham, Massachusetts, was founded in 2015 and today employs more than 100 people, all focused in some manner on the company's autonomous mobile robotics business. 6 River Systems is a privately held company and has cumulatively received over \$47 million in funding – its latest Series B round was a \$25 million investment led by Menlo Ventures.

6 River Systems' product offering is a combination of an autonomous mobile robot called Chuck and a cloud-based robot management system called the collaborative fulfillment system. The system is designed to deliver benefits to its customers across three core areas:

- The Chuck robot eliminates long walks for workers in the fulfillment center by delivering the work to the operators in the active area.
- The cloud-based algorithms manage work in real time, designed to maximize the utilization of people and robots and to reduce steps in between the tasks.
- The Chuck paces human workers in the fulfillment process and is a simple-to-use product that requires little training of associates. 6 River Systems has a patent for a warehouse robot that leads/directs human pickers through their tasks.

There are multiple approaches to managing human and robot workflows. The approach that 6 River Systems uses is built upon a "lead the follower" methodology where the robot physically leads the human worker through the picking process. The guided workflow approach helps by keeping the human workers engaged and focused on the task at hand. When a worker is finished with one robot, they are directed to a second robot waiting nearby. The guidance model uses a series of tools built onto the Chuck to direct the pickers' actions. There is a tablet on the front of the robot that provides the worker with the location and product to be picked. In addition, there are lights that illuminate on the side of the robot where the pick location exists on the racking. Finally, lighting also illuminates along the bin location on the Chuck itself where the picker is to place each pick.

The Chuck is a modular system that can be configured to support a variety of needs in a fulfillment center including multiple size bins/totes in various configurations on the robot, the option for a three-level configuration, and even the option for a garment hanger. The highly configurable Chuck can also be delivered in different sizes with a 24in.-wide version and a 30in.-wide version. The different widths of the robots allow the Chuck to be useful in facilities with various width aisles but also enables a wider platform option to be able to fit wider or more bins/totes.

The 6 River Systems' autonomous mobile robotic system can be quickly deployed, taking as little as 4 hours in its fastest deployment. Deploying the robots does not require any facility modifications, allowing the robots to be "dropped in" to existing facilities and reducing disruption to the ongoing

operation. For navigation, the Chucks use a combination of sensors including LIDAR to localize off the warehouse environment and dynamically navigate around obstacles. Chucks use no wires, stickers, or markers to navigate a facility. The company has a direct delivery model and has integrations with leading WMS solutions including HighJump, Manhattan Associates, Infor, JDA, SAP, and Synapse.

Strengths

6 River Systems' focus on the fulfillment process is a key strength. The company has developed a product purpose built for the needs of the picking processes in fulfillment, although the robots can support other processes such as put away. The pedigree of the organization is a key strength as well, having been founded by former Kiva executives, giving the founders a sense of both what it takes to deliver robotics into fulfillment centers and a strong foundational knowledge of the operations for which the robots have been designed. This pedigree has enabled the company to take lessons learned relative to the deficiencies of one model and develop a flexible automation model that meets the needs of the parts of the market that are not a fit for Kiva-like systems.

Challenges

The biggest challenge for 6 River Systems is more a function of growing pains. Growth is fueling an increasing need for quality engineers. As with every company, there are employees with different levels of experience and skills. Therefore, there are times when a less-seasoned engineer may be deployed without the understanding of the customer as some of the more experienced engineers. Again, this is more a function of growth than anything. Along the growth challenge area, 6 River Systems is launching in Europe in spring 2019, with its first customer going live in Holland in March. The company needs to make certain its international expansion does not overtax its growth plans in the United States.

Consider 6 River Systems When

Companies in retail, ecommerce, and 3PL are looking for a flexible and easy-to-use option for deploying automation in the fulfillment process can confidently consider 6 River Systems. The company comes to market with a strong understanding of both robotics and fulfillment operations and has been able to develop a system built for the needs of existing order fulfillment operations, typically reliant on manual effort.

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 11 vendors evaluated for this IDC MarketScape provide autonomous mobile robots and the related software applications to enable organizations to automate material movement steps within the order fulfillment process. All of the vendors evaluated meet the core requirement of having the capacity to deliver enterprise labeling 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 in the order fulfillment process.

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 order fulfillment enable organizations to automate certain material movement tasks within the processes related to order fulfillment within a fulfillment center. Order fulfillment plays a key role in supply chain execution, and autonomous mobile robots are a tool to be used to deliver more efficient and effective fulfillment process execution. The market for autonomous mobile robots for order fulfillment is not necessarily new, but more recent developments in the technology and market demands 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.

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: Mobile Robots in the Warehouse and Fulfillment Center in the United States, 2018* (IDC #US42954618, 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 order fulfillment 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 the fulfillment process and the digital elements of the business."

About IDC

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