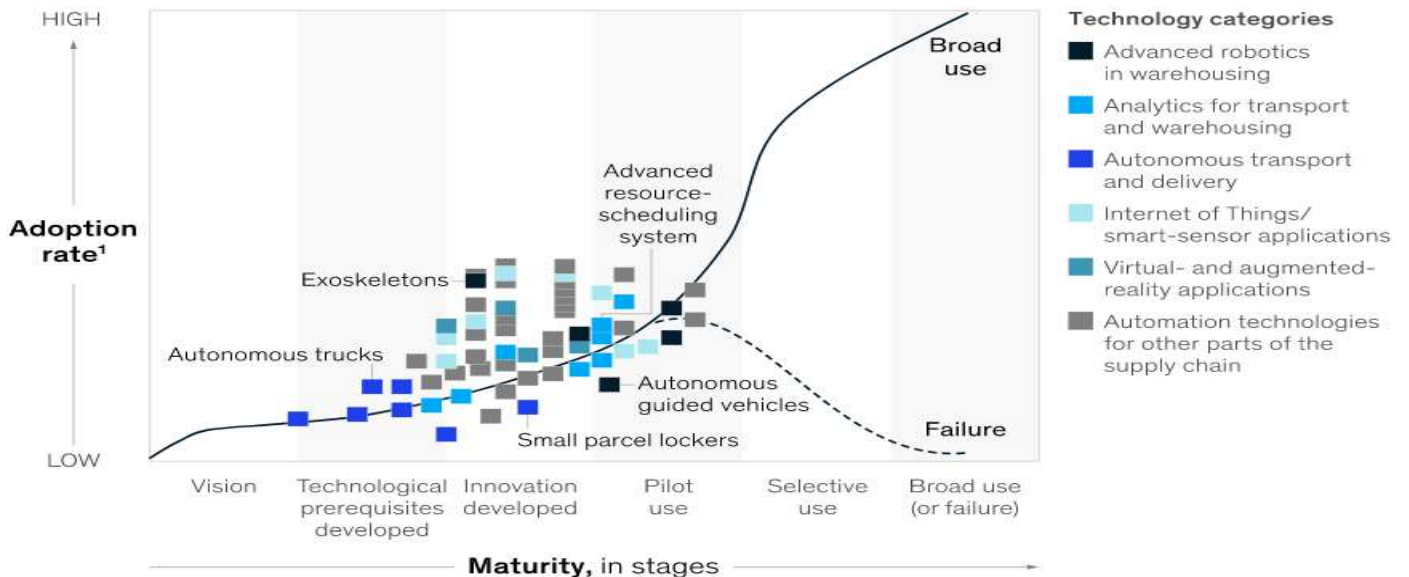




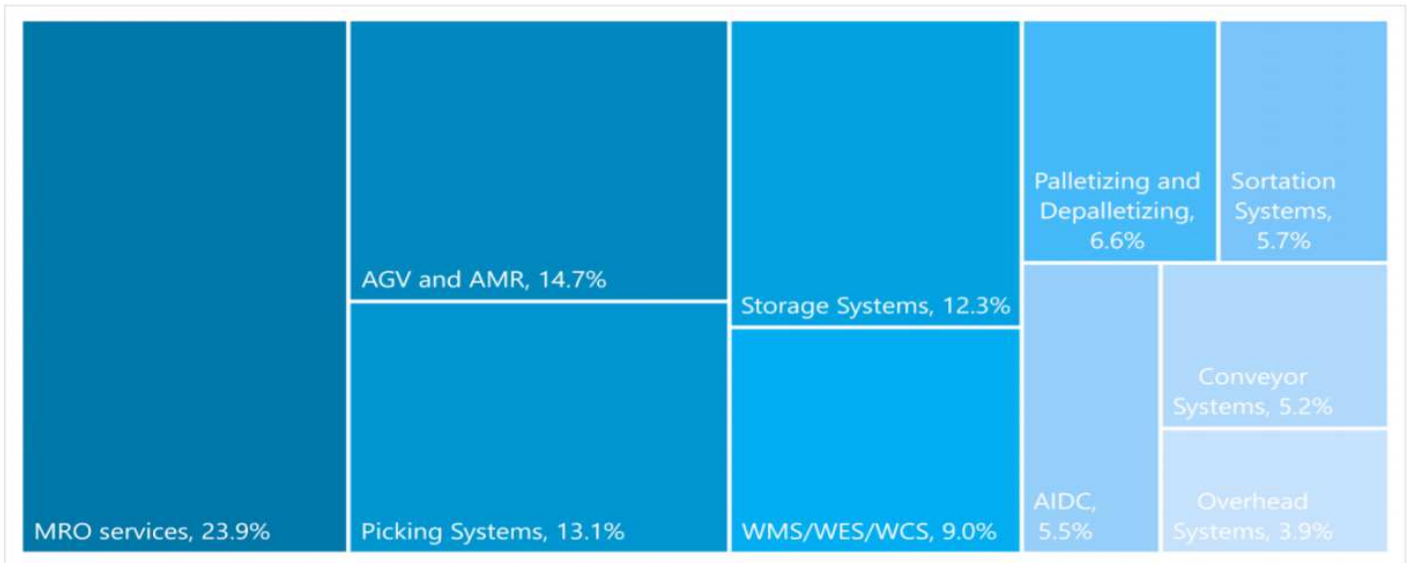
Stocks to Benefit from Accelerating Warehouse Automation & Smart Factory Themes

The industrial part of the economy has seen plenty of volatility this year and various ups and downs the last few years, but a few growth trends continue across any macroenvironment, and in the Industrial sector a key emerging trend is the acceleration of warehouse automation and smart factories. The WSJ recently featured a “Logistics Report” highlighting how the pandemic has resulted in companies investing deeper in logistics technology into distribution centers. This is being driven by both the increase in online shopping as well as social distancing within warehouse operations creating a need for more technology. The article highlights a survey by Honeywell (HON), a leader in automation, that shows companies in ecommerce and food & beverage are most willing to increase investments. I expect this to be a multi-year trend with several beneficiaries including a number of currently private makers of robotic components. Technology advancements in robotics are moving quickly and improvements in sensing technology, machine learning, and connectivity are likely to drive further investments by companies seeking to both increase supply chain efficiency and reduce costs. Examples of warehouse automation solutions included Automated Storage and Retrieval (AS/RS), Conveyor Systems, Pick-to-Light Systems, Voice Picking/Tasking, Sortation Systems, Collaborative Mobile Robots (AMRs), Automated Guided Vehicles (AGV) and Drones. Automation within logistics benefits both the business and consumers with cost efficiencies and faster distribution. It also has benefits such as less errors and increased warehouse safety. Many companies refer to this overall movement as Industry 4.0 which also includes usage of cloud computing and blockchain technology for big data/analytics insights, essentially the digital transformation of the industrial sector.

Logistics-technology development



¹Speed of innovation adoption based on maturity.
Source: McKinsey Supply Chain 4.0 Innovation Survey.

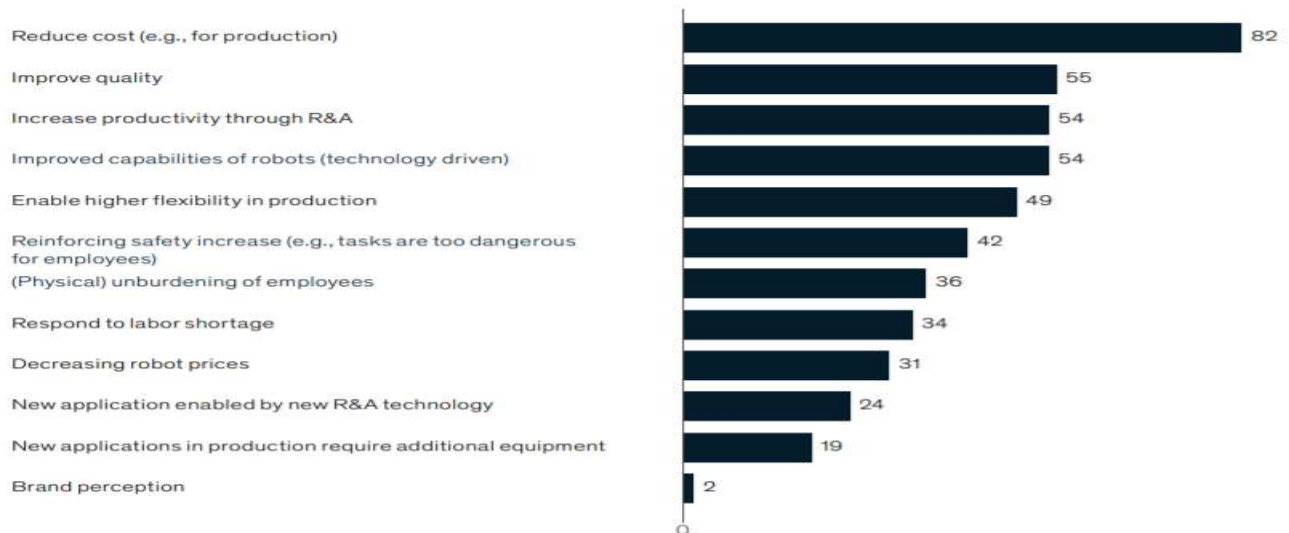


Sources:,LogisticsIQ

The global market for warehouse and logistics automation was about \$53 billion last year and forecasts expect it to reach \$80B in 2023 with ecommerce the main driver fueling the increase according to ROBO Global’s CEO. Mordor Intelligence estimates the logistics automation market at \$55.15B in 2019 expected to reach \$108B by 2025, a 12% CAGR. Adoption is also being driven by high warehouse rents and shortage of skilled workers and the boom of last mile delivery and micro fulfillment centers. Further, an environment with record low interest rates and elevated capacity utilization and aging equipment sets up for a strong investment cycle in automation to replace an ageing fleet.

Main drivers triggering investment in robotics and automation solutions

100% = 85 respondents



Source: McKinsey Global Robotics Survey 2018

Supply Chain Solutions – Trends and Impacts

The future of supply chains requires speed, flexibility, and accuracy



Urbanization

55%



55% of global population lives in cities¹

Speed

↓ 2.5



Days max. accepted shipping time²

Variety

350m



SKUs handled by large e-commerce player³

Omni-channel

USD6.5tn



Retail e-commerce spend by 2023⁴

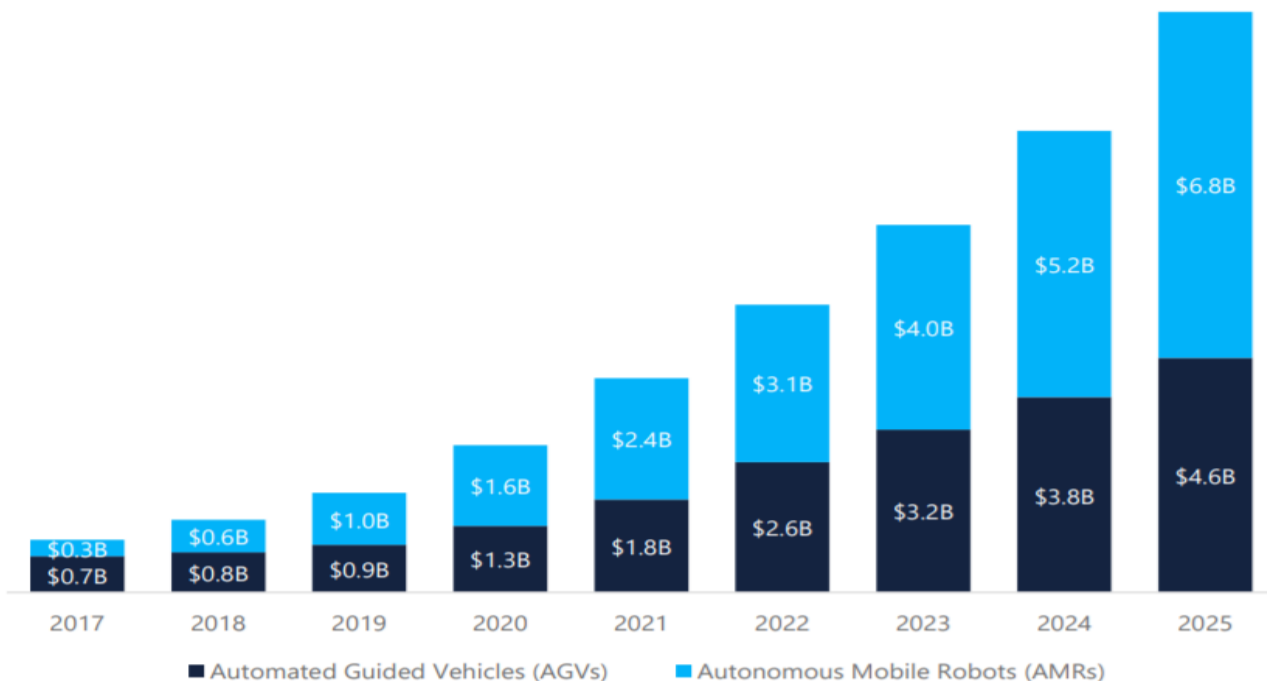
Automation

10%



Fully automated warehouse globally⁵

There are a number of interesting companies in this space, and at the end of this article included 400 key player sin the automation market ecosystem broken down into specific technology groups. The robotics area is a hot area and seen some recent deals including Shopify (SHOP) buying 6 River Systems for \$450M and Teradyne (ETR) buying AutoGuide for \$165M, two players in AGV/AMR. Demand for mobile robots is expected to surge 60% this year and surpass a \$3B market according to Interact Analysis. Annual shipments of industrial robots is increasing rapidly and creating a much larger installed base. A few other key US private companies to keep an eye on are Locus Robotics, Fetch Robotics, Rethink Robotics, and IAM Robotics.



A few international large players include **Schneider Electric, Siemens AG, OMRON Global**, and a top pure-play name is **Kion Group**.

In the US the main large cap play Industrials include **Honeywell (HON), Emerson (EMR), Eaton (ETN) and Rockwell Automation (ROK)**. However, these large companies also have a lot of other businesses and may not see as much of an overall profit/revenue impact, so I prefer to look at mid-cap pure-plays. A few names of interest include:

Zebra Technologies (ZBRA) has a leading 40% market share in barcode printing as well as Enterprise Mobile Computing and Data Capture Solutions. ZBRA is positioned well for megatrends such as IoT, Enterprise Mobility, Cloud Computing, and E-Commerce. It recently did a \$565M deal for Reflexis Systems, a leading provider of intelligent workforce management solutions. ZBRA recently noted an acceleration around digitization and automation across its key four vertical markets and specifically cited the grocer market as a large customer. ZBRA also announced a collaboration with Fetch Robotics earlier this year for warehousing picking.

PTC Inc. (PTC) is a leading maker of design and cloud software for industrial companies that has been investing in IoT and sees a long-term opportunity in CAD, IoT, PLM and AR markets. It has strategic alliances with Rockwell Automation (ROK), ANSYS (ANSS) and Microsoft (MSFT). IDC predicts that by 2022, 70% of manufacturers will use cloud-based innovation platforms and marketplaces for cross-industry and customer co-development. GreyOrange, an exciting warehouse automation and robotics provider, relies on Windchill cloud technology for their product life cycle management needs. PTC acquired this technology via its Onshape acquisition.

AMETEK (AME) is a favorite Industrial Tech play though only around 10% exposure to the automation theme. It called out strength in the Automation business, specifically in China on its latest earnings call.

Cognex (CGNX) is a leader in machine-vision products with exposure to factory automation as well as logistics and other end markets. Cognex products are also used to automate distribution processes in the logistics industry, including for applications in retail distribution and ecommerce to scan, track, and sort goods through distribution centers.

Avery Dennison (AVY) is a player in labels and packaging that has a strong RFID business and sees broader adoption in the apparel business as more companies are buying into their use for better inventory management, especially as omnichannel growth surges.

XPO Logistics (XPO) is a top logistics play implementing a lot of these technologies. In 2018, it launched WMx, a proprietary warehouse management platform; it integrates robotics and other advanced automation into operations with a high degree of control, even when complex, third-party software is involved. Its warehouse platform is a key competitive advantage, particularly in multichannel environments.

After these names there are a few interesting smaller Industrial names:

Gates Industrial (GTES) is a small maker of power transmission and fluid power solutions that are used in warehouses, such as conveyor belts.

Matthews (MATW) Industrial Technologies segment delivers marking and coding equipment and consumables, industrial automation products and order fulfillment systems for identifying, tracking, picking and conveying consumer and industrial products for the warehousing and industrial industries.

Teledyne Tech (TDY) is a long time favorite, a leading LiDAR name that designs and manufactures sensors and modules for industrial robots. Its technology improves vision guidance for robots as well as logistics and automated guided vehicles.

Hyster-Yale (HY) is a small maker of lift trucks and components for various markets that has been positioning more in the fully automated and hybrid automated solution markets.

Moog (MOG-A) is an Industrial I have long favored and seen as undervalued as a maker of precision components and controls. It notes in its latest Annual Report "An aging population and lack of skilled labor in many industries is increasing

the need for more advanced robotics. In addition, advances in sensors, artificial intelligence and autonomous systems are making it possible to introduce new types of automation into old industries such as construction and agriculture. Moog is ideally positioned to take advantage of these macro trends. Our deep expertise in motion components and high reliability systems, combined with our continuing investments in innovation, give us the tools to meet this emerging demand.”

Belden (BDC) is a maker of connectivity solutions and cables that are used in many of these industrial automation tools and robots. It noted at its December Investor Day the rising cost of labor and surprising declining cost of robotics. It notes “As labor costs have risen, the costs of robots, which is a good proxy for automation costs in general, have declined substantially. So labor is getting much more expensive with machines getting much less expensive. This, coupled with a historically low cost of capital with interest rates near all-time lows, creates a very compelling case for investments in automation.” Another important note it mentions is “Beyond these favorable cost dynamics, the current historically long economic expansion cycle has resulted in elevated capacity utilization rates and aging equipment. Specifically, utilization rates in the United States are approaching 80% and equipment age approaching 8 years or peak levels for this upcycle. These are typically good leading indicators of demand in addition to the favorable dynamics around industrial IoT, or Internet of Things, that we benefit from. Aging and heavily utilized equipment should drive demand for replacement and upgrade. We expect this to support further investment in new automation.”

Materion (MTRN) is a maker of advanced engineer materials that cites industrial automation as a key driver.

Barnes (B) is a small maker of precision components and its Automation business designs and develops robotic grippers, advanced end-of-arm tooling systems, sensors and other automation components for intelligent robotic handling solutions and industrial automation applications.

FLIR Systems (FLIR) is a maker of industrial vision products, often thermal imaging, and its camera business is instrumental to the machine vision industry.

Altra Industrial Motion (AIMC) is a maker of motion-control products with industrial automation and robotics cited as key growth end-markets.

Allied Motion (AMOT) is a very intriguing \$440M maker of motion-control components with applications for industrialized and specialized robots.

Applied Industrial (AIT) is a distribution play, a leading distributor of products including bearings, power transmission products, engineered fluid power components and systems, specialty flow control solutions, machinery and robotics automation products, industrial rubber products, linear motion components, tools, safety products, and other industrial and maintenance supplies.

An offshoot of this theme is the continued benefit to Semiconductor companies and a few notable ones with exposure include **Teradyne (TER)**, **Entegris (ENTG)**, **Brooks (BRKS)**, **Cadence (CDNS)**, **Synopsys (SNPS)**, **Silicon Labs (SLAB)**, **ON Semi (ON)**, **CEVA (CEVA)**, **Novanta (NOVT)** **Ambarella (AMBA)** and **NVIDIA (NVDA)**.

In closing, there are a number of angles to position for the Industrial 4.0 revolution that is in the early stages of an accelerated transformation due to the technological improvements in robotics, automation software, AI and machine learnings.

400 Key Players in Warehouse Automation Market Ecosystem

Warehouse Management System (40)



Last Mile Delivery (34)



Material Handling Solution Providers (90)



Automatic Identification & Data Capture (24)



Micro-Fulfillment (18)



Piece Picking Robots (19)



Warehouse Drones (11)



Autonomy Solution Providers (31)



Robotics Components (29)



AGV/AMR (100)



