

Market Forecast

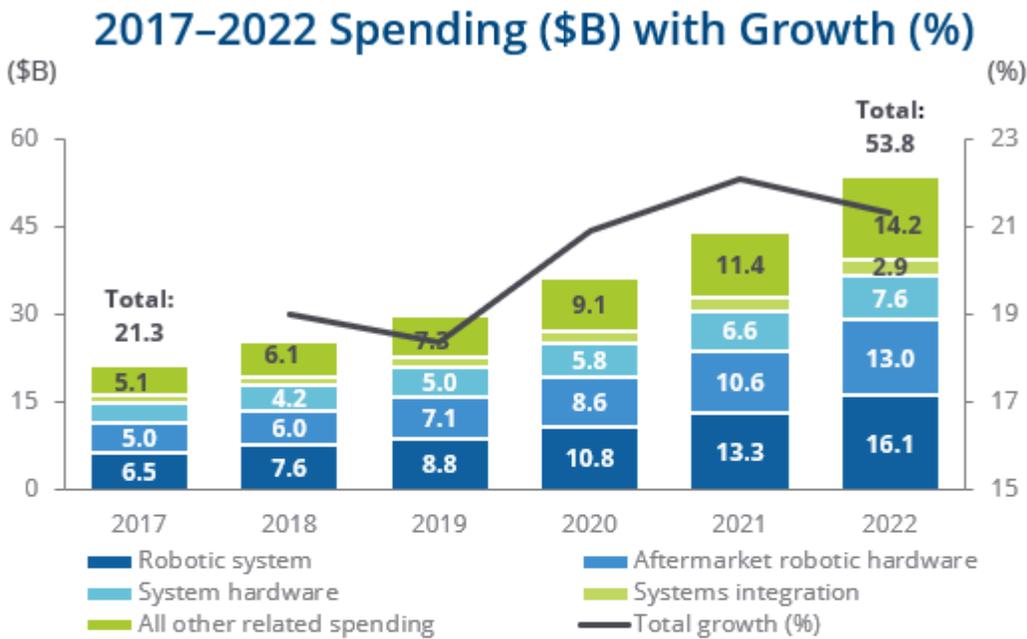
Worldwide Commercial Service Robotics Forecast, 2019-2022

John Santagate

IDC MARKET FORECAST FIGURE

FIGURE 1

Worldwide Commercial Service Robotics Spending Snapshot



Selected Segment Growth Rate	Total Market CAGR
▲ Robotic system CAGR 19.9%	20.3%
▲ Aftermarket robotic hardware CAGR 21.1%	
▲ System hardware CAGR 16.8%	
▲ Systems integration CAGR 18.1%	
▲ All other related spending CAGR 22.7%	

Note: Chart legend should be read from left to right, starting from the first row.

Source: IDC, 2019

EXECUTIVE SUMMARY

IDC forecasts that the worldwide market for commercial service robotics will grow quite rapidly over the next five years, with a five-year compound annual growth rate (CAGR) in excess of 20% to reach over \$53 billion by 2022. This forecast considers the sale of commercial service robots as well as the related components, services, and technologies. This growth is attributed to a robotics market that has matured to a point where users of the technology are achieving significant business value due to the use of the technology, which is translating into a buyer market that is increasingly accepting of the technology that is driving buyer investment. Commercial service robotics is still an early market, as new vendors continue to emerge with robotic applications built for new tasks and directed at new markets. Vendors in the space are developing innovations that are making commercial service robots easier to deploy and use and at a cost and business model that is appealing to markets that have not historically been the target market for robotics vendors.

This forecast study is exclusively looking at the commercial service robotics market. This market consists of the use of robotics outside of the traditional industrial manufacturing industries such as in retail, hospitality, logistics and distribution, and healthcare. Advancements in safety, collaborative robotics, improved usability, and cost considerations have helped drive these markets to look toward robotics. Key takeaways from this forecast include the following:

- The worldwide commercial service robotics market is currently forecast to reach a total market spend in 2022 of over \$53 billion, representing a CAGR of 20.3% for 2017-2022.
- The sale of robots accounts for around 30% of the forecast each year, and the remaining 70% of the forecast is for other related technologies, aftermarket components, and services including integration and advisory.
- Currently, from a regional perspective, Asia/Pacific is the largest market for commercial service robotics with 69.3% market share, followed by Europe, Middle East, and Africa with 18.1% market share and finally the Americas with 12.5% market share. The CAGR looks a bit different by region, with Asia/Pacific leading the way with a five-year CAGR of 21.9%, followed by the Americas with a 19.6% CAGR and Europe, Middle East, and Africa with a 14.1% CAGR.

This IDC study provides market sizing of the worldwide commercial service robotics market for 2017. In addition, the study provides a worldwide commercial service robotics forecast for 2019-2022.

"Rather recent advancements in robotic technology have helped deliver robots that are providing nonmanufacturing industries with the opportunity to deploy robots within their operation," said John Santagate, research director for Commercial Service Robotics at IDC. "This is a very interesting market as we see 20% growth for each of the next five years as robots continue to deliver significant business process improvements across a wide range of industries because robots are now capable of performing a broad range of tasks and are doing so in collaboration with human workers."

ADVICE FOR TECHNOLOGY SUPPLIERS

As the market continues to grow for commercial service robotics, vendors supplying technology in this market should consider the following:

- **Know the tasks your robots are helping buyers with.** Buyers are looking to commercial service robotics to augment their human workers. The realization is there that robots can take on

certain tasks that are enabling the human worker to focus on other tasks that are less suited to robotics and automation and more suited to the characteristics of human beings. Robots are typically associated with taking on the 3D's of work (dull, dirty, or dangerous). A lot of growth is coming from the use of robots taking on the nonvalue-adding movement of materials, reducing the amount of walking that people are having to do in their jobs, which is quite dull. Overall, commercial service robot adoption is being driven by task-level execution. Robots are tools meant to improve the jobs and output of the people that already exist within the operation.

- **Build out the partner ecosystem.** The market for commercial service robotics did not magically appear overnight. Indeed, improvements in related technology areas including artificial intelligence/machine learning, machine vision, motors and drives, connectivity, big data and analytics, and other tech areas played a significant role in the ability to develop modern commercial service robots. In addition to the components that are built into the robots, it is equally important to consider how you construct the ecosystem around integration partners, traditional business application vendors, and support operations. As demand grows, such partnerships can help enable an easier path to scale and reduce some internal constraints by leveraging partners to help build the market.
- **Realize the value of the data.** In addition to enabling task automation, commercial service robots are able to create and capture new sources of data that can go a long way toward helping an organization along its path to digital transformation. As you build out your robotic applications and related software applications, be sure to keep a keen eye on the data that is being acquired and either build out the capability to capitalize on this data or partner with application vendors that can expand the value of the robots through data management and analytics.
- **Capture and communicate customer successes, and document lessons learned.** As with any new market, there are early adopters, fast followers, and laggards. The early adopters that you are working with can be a valuable resource in terms of developing messaging that can drive the broader market to adopt the technology. If possible, get a sense of the performance of your customers across key-related metrics before the deployment of your robots and capture the performance improvements delivered. Whenever possible, leverage these successes to showcase to the market how the technology is delivering value. Also, be sure to create an ongoing catalog of lessons learned that you can refer back to in order to avoid previous pitfalls and hit on success factors.
- **Find a place to win and grow from there.** Find a market, business process, or industry that has a need/demand for your product and build from there. Win first, and scale from there. Chances are technology that delivers value for one industry, process, or market can be translated to other areas. Keep in mind that as this is a very early market, finding a niche to drive success in and building a reputable brand will help when the time comes to expand the portfolio and/or grow the markets you serve.

MARKET FORECAST

IDC is forecasting the worldwide market for commercial service robotics to grow at a CAGR of 20.3% for five-year (from 2017-2022) period to reach a worldwide total addressable market (TAM) of over \$53.8 billion. Keep in mind, this figure includes the sale of robots as well as all related technologies, aftermarket components, and services. The market for just the robotic systems themselves is forecast to grow at a similar CAGR of 19.9% during the same five-year (from 2017 to 2022) period to reach a worldwide market for commercial service robotic systems of over \$16 billion, which equates to 29.9% of the total addressable market.

Table 1 displays the worldwide IDC forecast by the major segments noted in Figure 1. Figure 2 highlights the market forecast with each major category's contribution to the worldwide forecast. The worldwide forecast across major market components is followed by commercial service robotics forecasts for three global regions (see Table 2) and a depiction of geographic market share (see Figure 3). Tables 3-5 forecast each geographic region at the major segment level and include forecast growth rates.

TABLE 1

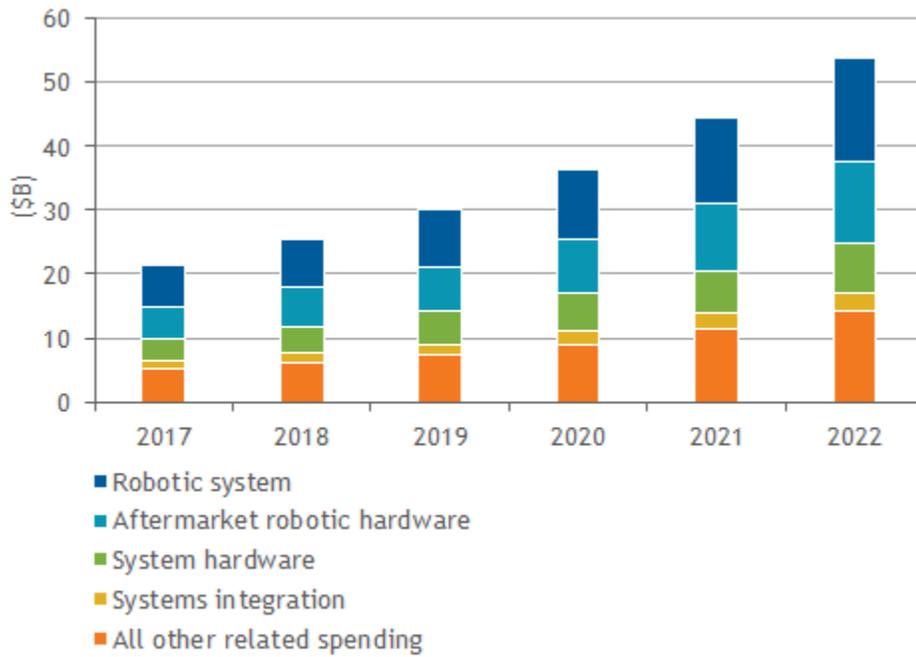
Worldwide Commercial Service Robotics Revenue by Category, 2017-2022 (\$M)

	2017	2018	2019	2020	2021	2022	2017–2022 CAGR (%)
Robotic system	6,481.1	7,564.5	8,847.7	10,796.2	13,292.6	16,091.7	19.9
Aftermarket robotic hardware	4,968.5	5,976.2	7,114.0	8,617.8	10,585.2	12,956.7	21.1
System hardware	3,489.8	4,239.8	5,022.5	5,778.2	6,614.1	7,600.4	16.8
Systems integration	1,279.8	1,447.2	1,699.0	2,053.4	2,495.7	2,943.9	18.1
All other related spending	5,100.0	6,142.7	7,347.7	9,069.2	11,354.7	14,204.0	22.7
Total	21,319.2	25,370.3	30,031.0	36,314.7	44,342.2	53,796.6	20.3

Source: IDC, 2019

FIGURE 2

Worldwide Commercial Service Robotics Revenue by Category, 2017-2022



Source: IDC, 2019

TABLE 2

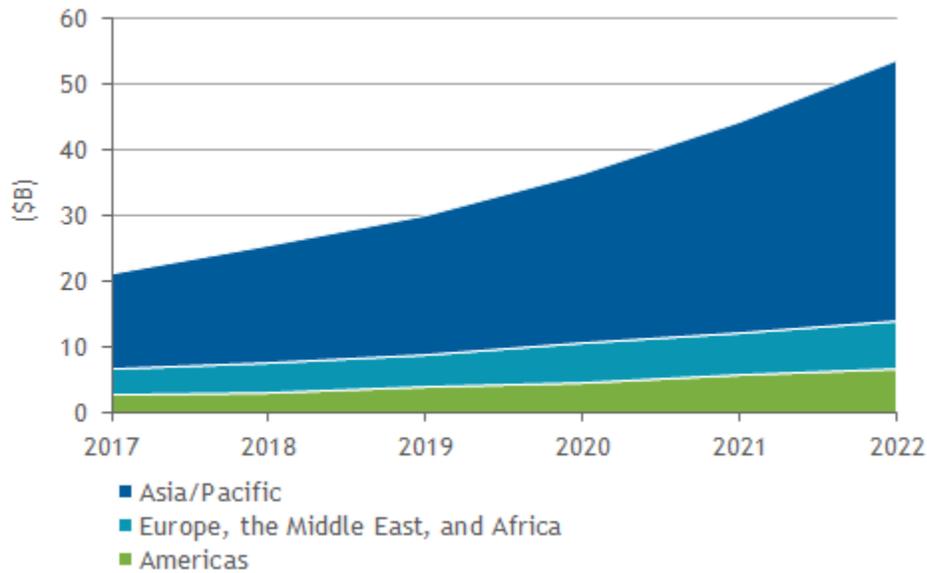
Worldwide Commercial Service Robotics Revenue by Region, 2017-2022 (\$M)

	2017	2018	2019	2020	2021	2022	2017-2022 CAGR (%)
Asia/Pacific	14,780.9	17,709.5	21,107.0	25,861.1	32,137.9	39,782.5	21.9
Americas	2,674.2	3,160.0	3,807.9	4,632.8	5,633.7	6,544.7	19.6
Europe, the Middle East, and Africa	3,864.2	4,500.8	5,116.1	5,820.8	6,570.6	7,469.4	14.1
Total	21,319.2	25,370.3	30,031.0	36,314.7	44,342.2	53,796.6	20.3

Source: IDC, 2019

FIGURE 3

Worldwide Commercial Service Robotics Revenue by Region, 2017-2022



Source: IDC, 2019

TABLE 3

Asia/Pacific Commercial Service Robotics Revenue by Category, 2017-2022 (\$M)

Category	2017	2018	2019	2020	2021	2022	2017–2022 CAGR (%)
Robotic system	4,809.9	5,588.4	6,609.2	8,225.9	10,364.3	12,665.2	21.4
Aftermarket robotic hardware	3,563.2	4,300.2	5,107.7	6,222.2	7,753.8	9,747.4	22.3
System hardware	2,340.3	2,940.1	3,557.3	4,133.5	4,715.9	5,423.3	18.3
Systems integration	829.6	941.5	1,114.9	1,369.2	1,702.4	2,032.2	19.6
All other related spending	3,237.9	3,939.3	4,717.9	5,910.3	7,601.4	9,914.3	25.1
Total	14,780.9	17,709.5	21,107.0	25,861.1	32,137.9	39,782.5	21.9

Source: IDC, 2019

TABLE 4**Americas Commercial Service Robotics Revenue by Category, 2017-2022 (\$M)**

	2017	2018	2019	2020	2021	2022	2017–2022 CAGR (%)
Robotic system	537.9	654.5	791.7	958.1	1,144.8	1,359.3	20.4
Aftermarket robotic hardware	664.3	784.2	941.8	1,149.7	1,397.8	1,603.7	19.3
System hardware	350.2	393.1	457.4	529.0	632.4	720.7	15.5
Systems integration	227.5	249.4	282.4	330.4	386.0	440.1	14.1
All other related spending	894.2	1,078.8	1,334.7	1,665.7	2,072.6	2,420.8	22.0
Total	2,674.2	3,160.0	3,807.9	4,632.8	5,633.7	6,544.7	19.6

Source: IDC, 2019

TABLE 5**Europe, the Middle East, and Africa Commercial Service Robotics Revenue by Category, 2017-2022 (\$M)**

	2017	2018	2019	2020	2021	2022	2017–2022 CAGR (%)
Robotic system	1,133.3	1,321.6	1,446.8	1,612.2	1,783.4	2,067.1	12.8
Aftermarket robotic hardware	740.9	891.8	1,064.5	1,245.9	1,433.5	1,605.6	16.7
System hardware	799.2	906.6	1,007.9	1,115.8	1,265.7	1,456.4	12.8
Systems integration	222.7	256.3	301.7	353.8	407.3	471.5	16.2
All other related spending	968.0	1,124.6	1,295.1	1,493.2	1,680.7	1,868.8	14.1
Total	3,864.2	4,500.8	5,116.1	5,820.8	6,570.6	7,469.4	14.1

Source: IDC, 2019

MARKET CONTEXT

Drivers and Inhibitors

Drivers

Maturity of Robotic Technology

- **Assumption:** Commercial service robotics has matured to a point where the devices can safely be deployed among human workers in such a way that adds value to the overall operation.
- **Impact:** Technology maturity has supported the development of commercial service robotic applications that can be deployed across new markets, industries, and for new use cases. By deploying commercial service robotics, organizations are able to automate certain tasks while augmenting human performance, which is delivering significant improvements across key business metrics.

Technology Interplay

- **Assumption:** The market for autonomous mobile robots (AMRs) has been helped along its path to maturity by the maturity of other technology areas including artificial intelligence, machine learning, Internet of Things, and cloud computing.
- **Impact:** Robots that are able to safely move among and interact with humans in the workplace have led to greater opportunity to deploy robots. The technology is enhanced with the ability for these robots to make their own decisions about material handling and movement, autonomously map a facility, learn how to respond to various scenarios, become a data capture mechanism, and be remotely controlled when necessary.

Labor Shortage and Work Environment

- **Assumption:** Robots are looked at as tools to take on dull, dirty, and dangerous jobs. While the labor issue is one that has different impact in different regions, there is a movement to automation to deliver labor arbitrage. While the degree of impact varies by region, this force is a significant driver of adoption in the leading markets for robotics. Commercial service robots support the needs of operations to augment human effort and reduce labor-constraint challenges.
- **Impact:** Commercial service robots enable an organization to shift job requirements, removing the mundane tasks. In addition, they enable organizations in constrained labor markets that are facing a labor shortage to maintain operations without risking the productivity of the operation.

Inhibitors

Labor-Related Concerns

- **Assumption:** Robots are often unfairly viewed negatively as a technology that is going to reduce job opportunities. This sentiment is shifting a bit as those that have deployed commercial service robots are recognizing improved working conditions and new job opportunities, but the concern remains a top inhibitor of adoption.
- **Impact:** Commercial service robots are built to augment human effort and deliver improved working conditions and outcomes. Indeed, as technology often does, it will not only change the jobs landscape requiring new skills but also open up new job opportunities.

Market Awareness

- **Assumption:** Commercial service robots are a technology designed to augment human effort and automate tasks related to certain business processes. Although the market has shown an interest in the technology, there remains work to be done to adequately educate the broader market as to the benefits of this technology.
- **Impact:** While many of the largest organizations have the budget and resources to experiment with robotics, a larger subset of the market is constrained in this area. This constraint leads organizations to focus on job execution without extending thought out to the possibilities of robotic technology. As the manufacturers of commercial service robotics increase their efforts to inform the market and socialize the benefits delivered to those that have adopted the technology, demand for the technology will increase.

Significant Market Developments

The significant market developments impacting the commercial service robotics market include:

- **Massive injections of venture capital:** More than \$12 billion was invested into the overall market for robotics and related systems in 2018. This figure continues a trend of exceptionally high venture capital funding flowing into the markets for robotics and the related ecosystem. The market for robotics continues to be a hot technology area that capital will continue to flow into, which is helping robotics companies to deliver innovation that will continue to drive market growth.
- **Robot as a service (RaaS):** The RaaS model of delivering robotics is helping makers of robotics to attract interest from buyers in industries that would not typically make investments in robotics. Indeed, the low risk associated with the RaaS model is helping emerging vendors to capture the attention of buyers as this model allows them to "prove it" while enabling them to showcase a strong ROI coupled with a rapid payback period. The innovative thinking that has helped build modern commercial service robotics is also helping transform business models, which takes some risk out of the decision to use the technology.
- **Collaborative robotics:** Collaborative robots straddle the line between industrial robotics and commercial service robotics. Companies throughout the robotics ecosystem (robot vendors, vision systems, intelligence software, motion control, etc.) are helping deliver innovations that are making robotic technology safe to operate in new environments. The ability of robots to safely be deployed in dynamic environments is a significant driver of adoption as it now means that robots can be relied upon to complete more tasks in more complex environments while not necessarily disrupting the operation.
- **Cloud robotics platforms:** Teaching robots what to do has historically taken a very long time and, in the past, was quite a complex effort. Today, however, application companies are leveraging the power, reach, and scale of the cloud to help drive more intelligent and useful robotics. The cloud is being used for an abundance of purposes today, including serving as a platform for simulating and training of robotics. By leveraging purpose-built robotic cloud platforms, developers and users are reducing the learning curve and making the deployment of robots in new environments more successful and much faster.
- **Autonomous mobile robots:** Autonomous mobile robots is a rapidly growing market for commercial service robotics. These robots are capable of safely navigating spaces populated by people and other equipment and "things" and are increasingly being relied upon to take on the low-value movement of materials throughout certain industries and business processes. As the market for ecommerce continues to grow, retailers continue to work toward omnichannel fulfillment strategies, and manufacturers shift toward direct-to-consumer fulfillment

models, thus the opportunities to leverage AMRs in the fulfillment processes will continue to grow. In addition, these devices are being built to handle a variety of payloads, as large as full pallets. Therefore, the opportunity to leverage AMRs exists across a variety of industries and is focusing on automating tasks related to moving materials throughout a facility.

Overall, the market for commercial service robotics is growing due to an abundance of factors. A steady stream of innovation is coming out of this market, resulting in new use case opportunities applicable to industries that have not traditionally been the market for robotics.

Changes from Prior Forecast

This study marks the first time that IDC is publishing a forecast study for the worldwide commercial service robotics market. Future iterations of this study will include a comparison of the previous forecast with the most current.

MARKET DEFINITION

Commercial service robots are those robotics technologies that perform some commercial task excluding manufacturing processes within the industrial manufacturing industry. Commercial service robotics is helping organizations to automate certain tasks that would otherwise be manually executed tasks. By doing so, this technology is taking on certain tasks and freeing up human resources to focus on other more complex tasks for the business.

METHODOLOGY

The data in this study is sourced from *IDC's Worldwide Semiannual Robotics and Drones Spending Guide Taxonomy, 1H18* (IDC #US44430618, November 2018).

IDC's Worldwide Semiannual Robotics and Drones Spending Guide provides a framework for vendors and enterprises as they look to navigate the complex ecosystem that surrounds this expanding and dynamic market. Both vendors and enterprises can benefit from understanding the main technology components that could be involved in a robotics and drone implementation as well as the wide and varied potential use cases. Understanding the main industries that are seeing the broadest adoption today will help readers evaluate whether there are similar opportunities that can be seen or applied in their own industry or business.

IDC's Worldwide Semiannual Robotics and Drones Spending Guide taxonomy is a guide to IDC's technology, regional, and industry views of the market. It should be used by readers to understand the overall structure of the robotics and drone market and how IDC organizes its market sizing efforts.

The market data and forecast information presented in IDC's Worldwide Semiannual Robotics and Drones Spending Guide program represent our best estimates of robotics and drone opportunity by industry, use case, and technology. The data presented is the combination of qualitative and quantitative data from a number of primary and secondary sources, including IDC's Worldwide Industry and Company Size Market Model, the research tanks of IDC's Insights businesses, and IDC's annual ICT survey of end-user organizations.

For this spending guide, IDC uses a global, detailed market model to forecast total robotics and drone system spending. The components of the model used to determine a market size and forecast for a

use case include demand-side data, supply-side data, industry trends, and the economic outlook to generate a model of technology spending.

IDC's Worldwide Semiannual Robotics and Drones Spending Guide and the related taxonomy will be updated at least once a year to reflect any adjustments to definitions or approaches.

Note: All numbers in this document may not be exact due to rounding.

RELATED RESEARCH

- *Service Robots and IoT* (IDC #US43174318, December 2018)
- *IDC's Worldwide Semiannual Robotics and Drones Spending Guide Taxonomy, 1H18* (IDC #US44430618, November 2018)
- *IDC PlanScope: Building the Business Case for Investment in Service Robots* (IDC #US42954618, October 2018)
- *IDC FutureScape: Worldwide Robotics 2019 Predictions* (IDC #US43376918, October 2018)
- *IDC's Forecast Scenario Assumptions for the ICT Markets and Historical Market Values and Exchange Rates, Version 2, 2018* (IDC #US44304718, September 2018)
- *North American Commercial Service Robotics Survey Results, 2018* (IDC #US44189718, August 2018)
- *IDC MaturityScape: Autonomous Mobile Robots in the Warehouse and Fulfillment Center 1.0* (IDC #US43175018, July 2018)

About IDC

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