

Perspectives on the service robotics market



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The global robotics market is in a period of transition from early adopter to early majority phase. The market is doubling in growth. New business models and use cases are emerging. Players are opening new segments and developing platforms with multiple tools. Radical innovation is starting to form, expected to reach early majority once the threshold of more than 16% adoption rate reaches the market.

The prices of robots are becoming more affordable, cost-efficient and flexible, such as RaaS lowering the total cost of ownership. Robot software today are easier to use, setup and deploy for business cases. Some technical hurdles remain, but the technologies, infrastructure and R&D to tackle them are in order.

Global Robotics Market

We expect the market for robots to expand from EUR 45 billion in 2020 to EUR 61 billion up to EUR 80 billion by 2024.¹ The market is sub-divided into Industrial Robots which include collaborative robots increasing at 30% per annum² and Service Robots at 12-17% CAGR between 2020-24.³

Industrial robots have increased for the last 5 years. Their operational stock worldwide has grown from 1 million in 2010 to 3 million by 2020.

Service robots will balloon to a EUR 20.8 billion market size by 2024.⁴ Currently at the end of the disillusion phase, the market is beginning to gain traction with real adopters. The market is entering the early majority phase of adoption (>16% penetration), which means growth is on the rise within the next 3-10 years.

While the pandemic slowed manufacturing robots, it served as an accelerator for service robots. Major segments such as logistics, health and pharmaceutical, cleaning/disinfection robots and robot

waiters are now expected to rise by 30-37%⁵ CAGR from 2020-24, contributed by staff shortages, labor expenses, health and worker safety concerns, while low-cost flexible RaaS models only served to lower the barriers to scale.

The Logistics sector influenced by e-commerce, boosted the use of autonomous guided vehicles (AGVs), drones, mobile bots and automated retrieval/storage systems. Strong incumbents with established use cases, user-friendly software, and improved navigation boosted the sector, in need for fast time-to-market of goods, efficiency and productivity.

Cleaning and Disinfection robots may have been the greatest breakthrough during the pandemic. Robots had reduced hospital-acquired infections by 53-100%, disinfecting a room in as fast as 5-10 minutes.⁶

Service robots shifting to early majority

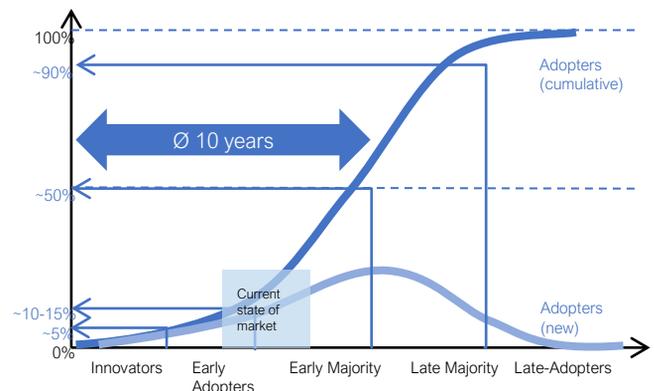


Figure 1: Technology stage of development in industrial robotics. Growth in industrial robots show market indicator that we are exiting the early adopter phase and entering the early majority.

Source: INVENSITY analysis, CoE Systematic Innovation

High potential service robot markets (EUR billion)

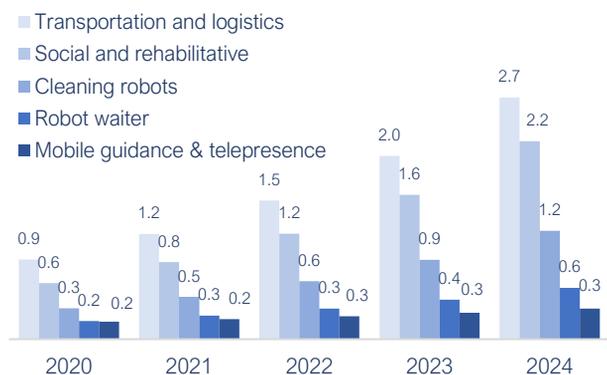


Figure 2: Market size of service robots. Segments are increasing by 30-37% CAGR, while telepresence is slower at 15% p.a.

Source: INVENSITY analysis, International Federation of Robotics, Tractica, Research and Markets, Emergen Research, Mordor Intelligence.

Many businesses in Europe and North America across industries (e.g., logistics, hospitality) now use robots for floor, window cleaning and housekeeping. Hospitality and Food Service robots are serving customers in major restaurants in the US, Asia (China, Japan, Korea), and parts of the Middle East. The market could grow to EUR 570 million by 2024,⁷ with low-cost Chinese robots helping to propel their expansion.

Social Robots have a fast-growing rehabilitative segment (+45% p.a.),⁸ especially for the elderly. Governments in the EU, US and Japan are funding robotics programs for the health sector, care and well-being of seniors. Meanwhile, telepresence robots will grow by a modest 15% CAGR,⁹ slowed down by COVID impact to mall gatherings and events.

Use Cases for Robotics

INVENSITY's analysis in a recent client project revealed that use cases are essential for the adoption and advancement of robots. Manufacturers have more potential to succeed if their robot portfolio is matched to different market and industry needs.

Industrial robots have served the manufacturing sector with different payloads, innovating on high-precision sensors, and machine vision for the robots to move in industrial environments. A robot's use case is also enhanced by the degree of automation, battery, cost efficiency, and the ability to integrate to an ERP or manufacturing execution system (MES).

In logistics, the standard use case includes palletizing, truck loading and picking. Robots in the warehouse also need flexible degrees of freedom, system integration, and software that enables the robot to navigate from point A to point B quickly.

Hotel and restaurants benefit from robots that can move in narrower spaces and different restaurant environments. They can be customized to support advertising and customer service. They should be able to transport food and plates while walking on uneven surfaces, slopes and steps. We also foresee an advantage for the robots to be augmented with reliable payment systems in the next five years.

Lab automation robots require automation of sampling tasks, machine analysis, and pipetting. Like restaurants, some labs have small spaces that robots would have to fit into. Lab robots suited for cleanrooms are currently priced at a premium to comply with regulations that require coating and materials to be dust-, chemical-, contaminant- and electrostatic discharge-free.

One application we found to have high potential are inventory scanning robots. Retail stores with thousands of stocks scanned regularly by human sales staff can benefit from what robots can do in an hour and with a much higher accuracy.

While social robots for the elderly have advanced in UI and applications like games and entertainment, they have yet to gain progress in features that are most helpful to seniors, such as medication/diagnosis. Cobot arms still have low payloads, which means they cannot transport the elderly. Such developments are still in progress or have yet to reach commercialization.



Figure 3: Robot waiter, social robot, and Cobot arm with a mobile base.

Robots-as-a-Service (RaaS) purchase criteria

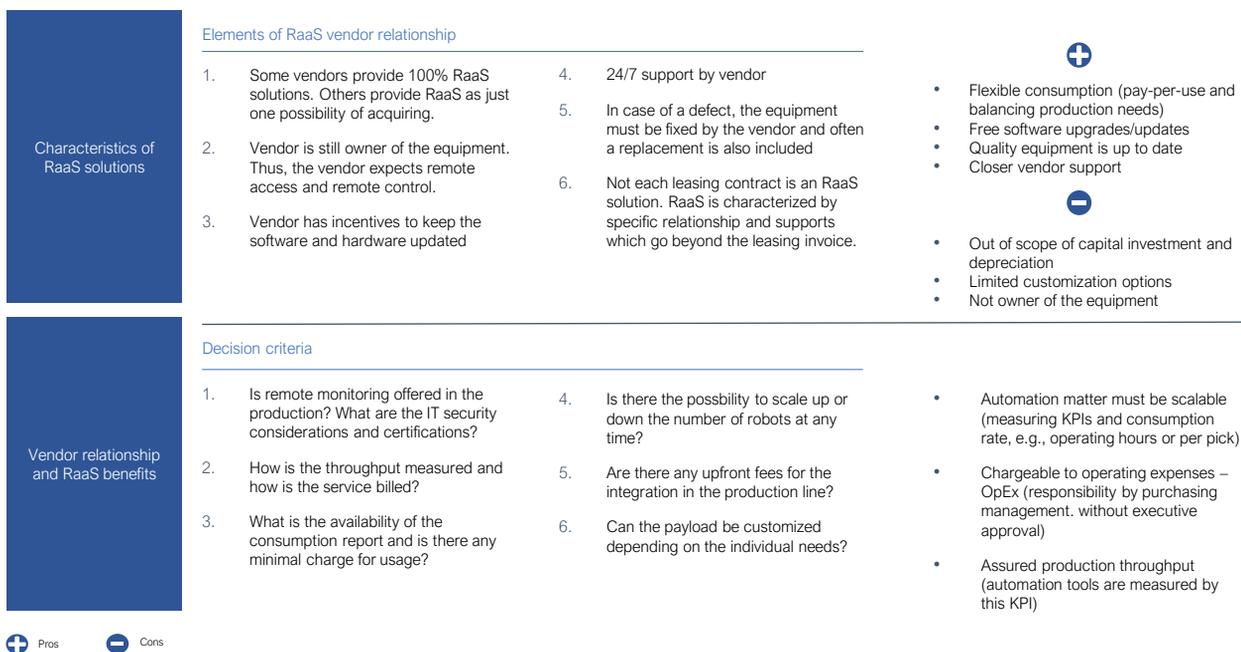


Figure 4: Buyer consideration for RaaS. A RaaS solution is specified by different elements. Thus, a vendor should be selected carefully depending on various criteria. Source: INVENSITY analysis, Mobilerobotguide.com

Rise of RaaS

The cost of robots have gone down in recent years. However, the price of some robots can still have a hefty price tag. This is partly the reason why Robots-as-a-Service as an affordable alternative is expanding globally by 66% annually, with the number of operational RaaS robots to exceed 1.3 million by 2026.¹⁰

Robots-as-a-service can offer flexible packages (ex. pay-per-monthly or hourly use, or by payload), free software upgrades, quality equipment, vendor support, replacement and maintenance. The cost of RaaS for a cleaning and disinfection robot is relatively more cost-efficient than market rates. At least three years of a robot on a monthly lease is currently worth a standard cleaning robot per unit of sale.

Buyers deciding on an RaaS contract can select RaaS vendors based on several factors (Figure 4). This includes the real-time and security of remote monitoring supported by the platform. The test of a quality robot is also the throughput capacity, measured by its value to contribute to automation efficiencies or output.

Some standard KPIs to measure robotic throughput is for example, by operating hours or per pick quantity.

The quality and robustness of software upgrades, option to customize according to requirements, and the flexibility to scale or downscale anytime are other noteworthy factors. Customers may also want to look at other fees, such as charges for integrating the robots to the production line, prior to setup.

Cost of robotics and RaaS (USD thousand)



Figure 5: Estimated cost of a standard robot. Source: INVENSITY research.

¹⁰ ABI Research

Outlook

Nearly all indicators for the expansion phase of robots can be seen in the market structure, technology and infrastructure of the robot ecosystem. When it comes to technology, advancing computation, artificial intelligence, 5G and IoT connectivity are going to define the next phase of robotics. As the market becomes more attractive, a surge of new competitors can be expected.

That said, not all companies in the market or entering the market now (or too late) will be able to remain. This may require greater precision in timing for robotics companies. Entering the market too early or too late can either result in an early burnout or a late market shakeout. The right timing depends on a careful balance of the necessary factors to adoption: technical, commercial and social.

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Get in touch

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