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World Robotics

Service Robots

2025

incl. Mobile and Medical Robots

Statistics, Market Analysis and Case Studies

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World Robotics 2025 – Service Robots

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Editorial

By: Francesco Ferro, CEO & Co-Founder of PAL Robotics

From research to reality: Robots that learn, adapt and assist

Service robots are quietly reshaping our daily environments. Once limited to factories or research labs, today's robots are becoming part of hospitals, classrooms, and public spaces, working alongside people and supporting tasks that range from industry to research. This shift marks a turning point in robotics: it is no longer a question if robots will be present in our lives, but how they will contribute meaningfully.

The growing demand for robotics in sectors such as healthcare and education has driven the development of more versatile, mobile, and user-adaptable systems. Mobile manipulators, in particular, are evolving from task-specific tools into general-purpose platforms. At the same time, a new emphasis on modularity allows these platforms to be configured and customised for a range of use cases, offering solutions that respond to real-world needs and changing environments.

Figure 1.: TIAGo Delivery assisting the healthcare team at Hospital de Badalona. Image credit: Pal Robotics.

Embodied AI: Training for solutions

A key factor enabling this new generation of service robots is the integration of embodied artificial intelligence. Unlike traditional models trained in simulation or on static data, embodied AI learns through direct physical interaction by being present in the environment, and adapting in real time.

This approach allows robots to develop behaviours that are shaped by context and experience. Navigating a hospital corridor, adapting to human gestures in a classroom, or responding to changes in layout or routine all require the kind of situated learning that embodied AI enables. These advancements are the result of progress not just in AI, but also in autonomy, perception, and real-time decision-making.

Human-centered design

At the core of service robotics lies a simple principle: technology should serve people. Human-centered design ensures that robots are not only capable, but also intuitive, trustworthy, and safe to work with.

This means designing user-friendly interfaces that reduce training time, integrating collaborative safety features for shared spaces, and developing systems that can adapt their behaviour based on who they are working with. The focus is not on automation for its own sake, but on meaningful assistance, complementing human tasks and easing operational burdens in fields where time and resources are often stretched.

Where robots are making a difference

The real impact of service robotics is clearest where technology meets everyday needs. In healthcare, autonomous mobile platforms are already improving efficiency and resilience by helping hospitals improve internal logistics, transporting materials efficiently and enabling clinical staff to focus on patient care.

In education, robots are enriching the way students learn and engage with technology. They are being used to teach core STEM concepts through hands-on programming and experimentation, and to make abstract ideas more accessible. Especially in remote or hybrid settings, robots can provide new modes of interaction, bringing real-world robotics into classrooms that may not otherwise have access. These tools are not just educational aids, they are also sparking interest in robotics and engineering careers among younger generations.

Beyond these people-centered sectors, service robots are also gaining traction in industrial environments. In warehouses and production facilities, mobile manipulators are being introduced to support tasks such as material handling, quality inspection, and flexible assembly. In contrast with traditional automation, these systems offer adaptability in changing layouts or mixed workflows, complementing human workers in dynamic

settings. The ability to quickly reconfigure or relocate robots makes them especially valuable in sectors where agility and customization are key.

Towards truly helpful robots

For service robots to thrive, they must go beyond performing tasks, they must understand the spaces they operate in, adapt to the people they assist, and be designed with a clear purpose: to help. This means more than technical capability. It means creating systems that fit into human routines, environments, and expectations, and that can respond flexibly when those change. The future of robotics will not be defined entirely by innovation, but by integration, by how well robots work with us, in ways that are meaningful, supportive, and aligned with real needs. In that future, robots are not just tools. They are partners in creating environments that are safer, smarter, and more human.

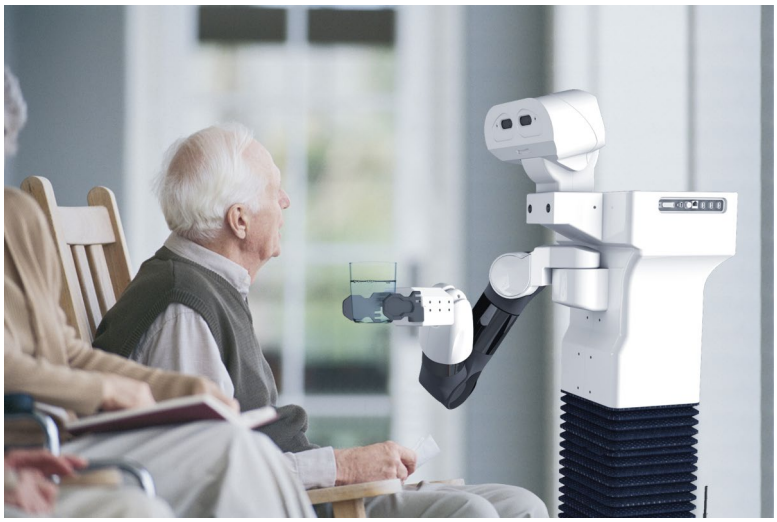

Figure 2: TIAGo assisting an elderly resident by delivering a bottle of water. Image credit: Pal Robotics.