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Professional Service Robots Market Assessment, By Robot Type [Field Robots, Medical Robots, Assistance Robots, Rescue and Security Robots, Inspection and Maintenance Robots, Domestic Robots, Others], By Configuration [Air-based, Water-based, Land-based, Wearable], By Control [Autonomous, Remotely Operated], By Industry [Industrial, Construction, Healthcare, Agriculture, Education, Retail, Defense and Security, Others], By Region, Opportunities and Forecast, 2016-2030F

https://marketpublishers.com/r/P9628B096CC0EN.html
Date: March 2025
Pages: 223
Price: US$ 4,500.00 (Single User License)
ID: P9628B096CC0EN

Abstracts

The global professional service robots market size in volume was 160.25 thousand units in 2022, and the market is forecasted to reach a volume of 618.89 thousand units by 2030, displaying a solid CAGR of 18.4% from 2023 to 2030. The professional service robots market is expanding rapidly due to the rising adoption of these robots in diverse industries to improve customer service and operational efficiency.

Shifting trends towards contactless services due to the COVID-19 pandemic, round-the-clock availability of robots, and cost-effectiveness fuel this growth. To sustain this trend, it is crucial to design service robots that can establish an emotional connection with customers by having human-like attributes, ensuring they are functional and user-friendly, and integrating them as collaborative co-workers alongside humans, considering the unique needs and acceptance of the customer base.

The adoption of professional service robots is bringing about a significant transformation

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across industries. For instance, according to the International Federation of Robotics (IFR), In 2021, sales of professional service robots surged by 37%, led by Europe, North America, and Asia. These robots are being deployed in various applications, from warehouses and healthcare facilities to hospitality and agriculture. In addition, over 20,000 hospitality robots were sold in 2021, and medical robots sales increased by 23%. The digitalization of agriculture saw more than 8,000 agricultural robots sold. This widespread adoption is driving increased efficiency, cost savings, and improved task performance, fundamentally reshaping industries by integrating professional service robots.

For instance, in December 2021, Intuitive, a global leader in minimally invasive care and robotic-assisted surgery, achieved a significant milestone with over 10 million robotic-assisted surgical procedures performed worldwide using their da Vinci surgical systems. This milestone underscores the benefits of high-quality, minimally invasive surgery for patients and healthcare systems.

Automation of Tedious Tasks Promoting the Market's Growth

The automation of repetitive and dull tasks significantly bolsters the growth of the global professional service robots market. When robots take on these monotonous responsibilities, they can enhance operational efficiency and profoundly impact the workforce. This shift allows human workers to redirect their time and skills toward more complicated, strategic, and creative aspects of their roles. Consequently, this reallocation of human resources increases productivity and job satisfaction. Moreover, it often leads to cost savings, reduced errors, and higher-quality results. Organizations are increasingly recognizing these advantages, prompting greater investment in professional service robots and propelling market expansion across a range of industries looking to streamline operations and elevate the role of the human workforce.

For example, in June 2023, PAL Robotics introduced the TIAGo Pro Edition, innovative robots equipped with torque-controllable arms, flexible mobile manipulation functions, and advanced interaction features tailored for agile manufacturing, industry 5.0, and healthcare applications.

Technological Advancements Driving Demand for Professional Service Robots Market

The growth of the professional service robots market is primarily fueled by technological advancements in robotics, including artificial intelligence, computer vision, and sensor technologies. These advancements equip robots with greater capabilities and versatility,

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enabling them to perform more intricate tasks. These technologies directly impact key aspects of professional service robots, enhancing their navigation, dexterity, and cognition.

For instance, Visual Simultaneous Localization and Mapping (VSLAM) technology facilitates autonomous navigation in dynamic environments. Embedded vision systems ensure safety and precision, allowing robots to interact safely with humans. Furthermore, artificial intelligence and machine learning empower robots to comprehend and respond to human interactions effectively, making them invaluable in customer service and various professional settings, thereby driving their adoption and market growth.

For example, in October 2023, Grubhub and Starship Technologies launched a robots-driven food delivery system at SUNY Polytechnic Institute's campus. The service enables users to place food orders using the Grubhub app, and the food is delivered by autonomous robots in a matter of minutes, improving the overall dining experience on campus.

Cost Optimization Through Professional Service Robots

The professional service robots market is experiencing growth owing to the cost-saving advantages offered to organizations. These robots are sought after by businesses aiming for long-term cost reductions. Service robots prove to be economically viable as they significantly limit the dependency on human labor, which can be costly and vulnerable to factors like labor shortages and turnovers. Furthermore, these robots demonstrate a relatively quick return on investment due to their ability to work continuously, ensure task consistency, and provide round-the-clock service. Cost-effectiveness initiates the adoption of professional service robots and sustains their integration across diverse industries. It fuels professional service robots market expansion by delivering concrete financial benefits to organizations looking to streamline their operations and cut costs.

For instance, in August 2022, NFI entered into a USD 10 million agreement to implement Boston Dynamics' robots, Stretch, within its United States warehousing operations. The strategic move is consistent with NFI's Applied Innovation initiative and aims to bolster operational capacity in response to ongoing supply chain demands. The initial program will commence at NFI's Savannah, GA facility in 2023, with further expansion planned for warehouse sites throughout North America.

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Significant Share of Europe in Professional Service Robots Market

Europe's leadership in the professional service robots market can be attributed to its robust industrial and manufacturing base, with countries like Germany driving the demand for robots in areas such as manufacturing and warehousing. Furthermore, Europe's well-established healthcare sector relies on service robots for tasks like patient care and rehabilitation, further propelling the professional service robots market. The region prioritizes research and development, nurturing innovation, and technological advancements in robotics. European governments have proactively supported robot adoption through incentives and regulatory frameworks, promoting their use across various industries. These factors, combined with a thriving ecosystem of robot manufacturers and developers, firmly establish Europe as a frontrunner in the professional service robots market.

For instance, in January 2021, in collaboration with UX Global, Currys conducted a trial of Pudu Robotics' KettyBot, a customer assistance robot, across four stores. This robot aids customers in finding items, thereby improving the in-store experience.

Government Initiatives are Proliferating the Market

Countries worldwide have acknowledged the importance of robotics in driving economic growth and managing the workforce's transformation due to automation. This recognition has led to diverse government initiatives to support the professional service robots market. For instance, the European Commission has proactively pursued robotics and artificial intelligence (AI) development, as highlighted in its 2017 communication on 'Artificial Intelligence for Europe.' Moreover, the European Union's General Data Protection Regulation (GDPR) imposes data protection regulations relevant to robotics applications. Similarly, France has launched the 'Robolution' plan to boost robotics and AI development and address workforce transitions through initiatives like 'France AI". These global initiatives underscore the worldwide recognition of robotics' potential impact across various regions and industries.

For instance, in September 2023, the Artificial Intelligence Act, an EU regulation, established thorough rules for safeguarding the well-being and rights of citizens when using AI systems. It applies to AI systems used or sold in the EU, with specific exceptions for military, scientific research, and certain free/open-source AI systems.

Impact of COVID-19

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The COVID-19 pandemic had a notable impact on the professional service robots market. It caused disruptions in production and supply chains, resulting in delays and higher costs. Economic downturns and budget constraints also led to reduced investments in service robotics. However, the pandemic spurred interest in robots for disinfection and healthcare support.

Post-pandemic, the professional service robots market is anticipated to rebound and experience significant growth. This resurgence can be attributed to factors such as rising costs of labor, shortage of qualified workers, and increased demand for automation across technical and personal sectors. Notably, the medical segment is expected to see substantial growth, driven by adopting medical robots for various healthcare applications.

Future Market Outlook (2023-2030)

The professional service robots market is expected to witness an increasing array of uses for professional service robots across industries such as healthcare, manufacturing, and agriculture.

The healthcare domain will substantially expand, with robots finding roles in patient care, surgical procedures, diagnostics, and telemedicine support.

Wider adoption of Industry 4.0 principles will propel the integration of robots in manufacturing and logistics, contributing to heightened efficiency and productivity.

Service robots will feature deeper integration of artificial intelligence (AI) and machine learning, enhancing their capability to perform intricate tasks and engage intelligently with humans.

The use of collaborative robots (cobots) working alongside human laborers will increase, fostering safer and more efficient workplaces.

Key Players Landscape and Outlook

Key players such as Daifuku Co., Ltd., ST Engineering Aethon, Inc., Intuitive Surgical, Inc., Elbit Systems Ltd., and Northrop Grumman Systems Corporation are pivotal in shaping dynamic landscape. They are instrumental in driving innovation and

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establishing industry standards to meet the growing demand for automation solutions. These major players are well-positioned to take advantage of emerging opportunities as the market expands, solidifying their status as trendsetters in the field with their involvement in diverse sectors such as healthcare, manufacturing, and defense.

In September 2023, PAL Robotics established PAL Italy srl in Bari. They plan to invest USD 5.4 million over the next 3-5 years, working in partnership with Italian universities to create robotics solutions, emphasizing agriculture, healthcare, logistics, and manufacturing sectors.

In July 2023, the first Software Development Kit (SDK) for the ARI social robots was released, comprising ROS-based tools, code, and documentation. SDK enables developers to smoothly design apps that leverage ARI's features while preserving ROS compatibility.

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Contents

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7. GLOBAL PROFESSIONAL SERVICE ROBOTS MARKET OUTLOOK, BY REGION, 2016-2030F

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8. MARKET MAPPING, 2022

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14. KEY PLAYERS OUTLOOK

*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

15. STRATEGIC RECOMMENDATIONS

16. ABOUT US & DISCLAIMER

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