

Humanoid Robot Market by Component (Hardware, Software), Motion Type (Biped, Wheel Drive), Application (Education and Entertainment, Research and Space Exploration, Personal Assistance and Caregiving) and Region - 2028

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Report description:

The humanoid robot market size is valued at USD 1.8 billion in 2023 and is anticipated to be USD 13.8 billion by 2028, growing at a CAGR of 50.2% from 2023 to 2028. Factors such as rising demand for humanoid robots from the medical and retail industries for personal assistance are likely to drive market growth during the forecast period.

Increasing use of humanoids as educational robots

Educational humanoid robots are a unique learning tool that creates a learning environment attracting and keeping students interested and motivated with joyful learning experiences. The field of educational robotics is moderately new; the existing literature in this area commonly deals with self-reported learning and enthusiasm for science, technology, engineering, and mathematics (STEM) as a direct result of using the educational robot as a tool for learning. Humanoid robots are influencing in terms of learning, attitudes, and workforce development programs in the educational field in various learning environments, such as formal classroom learning, out-of-school time, and robot competitions.

Humanoid robots have a huge impact on student learning and help children learn about different concepts. SoftBank Robotics (Japan) has developed an educational humanoid robot named Pepper, which is capable of recognizing faces and basic human emotions. NAO and Pepper have easily created an empathetic link with researchers and students by their appearances, humanoid behavior, and moderate sizes. These robots are assistants for educators. Their intuition and visual interface make the process of content creation easier as well as allows customized teaching activities in either small groups or on a one-to-one basis.

Humanoid robots are not only used for educational purposes but also research in universities. There are several educational robotics programs funded by the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and other public and private entities across the world.

In the past decade, the market for humanoid robots has grown at a significant rate; currently, they are gradually being

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incorporated into educational societies. The development of several less expensive humanoid robotic platforms, robotics software tools, programming languages, and several robotic simulators have made robots more accessible to several students, educators, and robot enthusiasts at all levels. Supported by accessible robot platforms and systems, the rapid growth of robotics in schools, universities, and even kindergartens signifies one of the most important developments in the education sector. Robotics courses, especially based on learning through assembling, constructing, and operating robots, along with the interaction and communication with robots, are widely accepted. Companies involved in the production of educational humanoid robots are SoftBank Robotics (Japan), UBTECH ROBOTICS (China), and HYULIM Robot (South Korea), among others. Hence, the increasing use of humanoid robots as an educational tool is driving the growth of the humanoid robot market.

Surging demand for humanoid robots from the retail industry for personal assistance

The retail industry already uses robots in several different ways across stores and warehouses, as the major applications of robots in retail are in warehouses and logistics. Humanoid robots are also highly deployed in the retail industry for serving primary robotic applications, such as in-store customer service and bringing the store to customers. The growing use of humanoid robots on retail shop floors leads to better customer engagement with personal assistance and enhanced user experience.

Humanoid robots establish a decent way to improve store experience; hence, they are heavily deployed in retail stores worldwide to overcome the lack of resources or inadequacies. Humanoids are deployed in stores to answer questions, provide directions, entertain, play, attract clients with games, and even provide a presentation to users and detect customers' emotional states. Also, humanoid robots benefit stores by collecting feedback from customers directly, which can be used to improve customer satisfaction. Humanoid robots are also used as sales assistants, brand ambassadors, information agents & guides, receptionists & welcome assistants in retail stores. Furthermore, technologically advanced features in robots help the retail industry maintain sales and CRM applications, customer recommendations, and payment services.

By introducing humanoids in the stores, several companies take on a positive image over their competitors. Softbank (Japan) manufactures Pepper, a 4-ft humanoid capable of recognizing faces and basic human emotions to welcome, inform, and entertain people in retail stores. The company has deployed its humanoid robot Pepper in more than 140 mobile stores in Japan. In May 2021, Snowdog (Poland) implemented a humanoid robot in the retail store eObuwie.pl. Another robot, NAO, is a 2-ft bipedal assistant used in retail, education, and research industries to welcome, inform, and entertain people. Pepper and NAO interact with the customers by utilizing personalized and relevant messages and offers. Pepper has been one of the famous robots used in several pilot projects in stores worldwide for personal assistance. Hence, the retail industry's growing deployment and increasing demand for personal assistance drive the humanoid robot market.

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Asia Pacific is the fastest-growing region in the humanoid robot market.

Asia Pacific is expected to have the highest CAGR during the forecast period. The increasing aging population in countries such as China and Japan will likely increase the deployment of humanoids for caregiving and personal assistance in the coming years in the Asia Pacific. The presence of prominent market players such as SoftBank Robotics (Japan), Honda Motor Co., Ltd. (Japan), and Toyota Motor Corporation (Japan) and the growing awareness regarding the benefits of humanoid robots are fueling their demand in Japan.

The breakup of primaries conducted during the study is depicted below:

- By Company Type: Tier 1 - 52 %, Tier 2 - 31%, and Tier 3 -17%
- By Designation: C-Level Executives - 47%, Directors - 31%, and Others - 22%
- By Region: North America- 37%, Europe - 28%, Asia Pacific - 31%, Rest of world- 4%

Research Coverage

The report segments the humanoid robot market and forecasts its size, by value, based on region (North America, Europe, Asia Pacific, and RoW), Component (hardware and software), application (education and entertainment, research and space exploration, personal assistance and caregiving, search, and rescue, public relations, and others (cleaning, inspection, maintenance, and surveillance)) and motion type (biped, and wheel drive). The report also comprehensively reviews market

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drivers, restraints, opportunities, and challenges in the humanoid robot market. The report also covers qualitative aspects in addition to the quantitative aspects of these markets.

Reason to Buy Report

The report will help the market leaders/new entrants with information on the closest approximations of the revenue numbers for the overall humanoid robot market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. The report also helps stakeholders understand the market pulse and provides information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

- Analysis of key drivers (growing development of humanoid robots with advanced features and increasing use of humanoids as educational robots), restraints (high initial cost and research and development expenses required for introducing advanced robotics, and safety concerns in humanoid robot adoption), opportunities (rapidly growing senior citizen population in most developed countries, and rising demand for humanoid robots from logistics sectors), and challenges (lack of high-level interfacing resulting in unpredictable performance of robots in untested environments, and limited market awareness hindering humanoid robot adoption)

- Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product & service launches in the humanoid robot market.

- Market Development: Comprehensive information about lucrative markets - the report analyses the humanoid robot market across varied regions.

- Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the humanoid robot market

- Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players like SoftBank Robotics (Japan), SoftBank Robotics (Japan), Honda Motor Co., Ltd. (Japan), Toyota Motor Corporation (Japan), among others in the humanoid robot market

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