

INDUSTRY OVERVIEW

The information and statistics set out in this section and other sections of this document were extracted from different official government publications, available sources from public market research and other sources from independent suppliers, and from the independent industry report prepared by China Insights Consultancy Limited (“CIC”). We engaged CIC to prepare an independent industry report in connection with the [REDACTED] (the “CIC Report”)¹. The information from official government sources has not been independently verified by us, the [Sole Sponsor, [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED]], [REDACTED], [REDACTED], any of the directors and advisers, or any other persons or parties involved in the [REDACTED], and no representation is given as to its accuracy. Accordingly, the information from official government sources contained herein may not be accurate and should not be unduly relied upon.

OVERVIEW OF INTELLIGENT ROBOTICS MARKET

Introduction of Intelligent Robots

Intelligent robots refer to robots with intelligent behaviors and can demonstrate human-like cognitive and physical capabilities through advanced technologies such as artificial intelligence (“AI”), machine learning and advanced control technologies, thereby achieving autonomous operation and adapting to complex environments.

Based on form factors and functional characteristics, intelligent robots are generally classified into the following categories:

- (i) **intelligent mobile robots**, which are equipped with navigation devices and controlled by onboard control systems, and which, based on environmental perception and modeling, can achieve autonomous behavior in complex environments to carry out tasks such as cargo transport, material handling, picking and delivery;
- (ii) **intelligent manipulation robots**, which are robots with operable manipulators (typically six axes or more robotic arms) and are capable of safe interaction and collaboration with humans in shared workspaces; and
- (iii) **embodied intelligence robots**, which are intelligent robots designed with biomimetic morphologies and locomotion mechanisms inspired by humans or animals, integrating AI, perception systems and embodied control technologies. Their core features include multi-degree-of-freedom motion and dexterous manipulation enabled by biomimetic structures, as well as environment perception, task understanding, autonomous planning and adaptive execution enabled by intelligent algorithms. Embodied intelligence robots typically include humanoid robots, mobile manipulation robots and quadruped robots.

Note:

¹ CIC was commissioned to conduct an analysis of, and to report global intelligent robotics industry at a fee of approximately RMB583,000. The commissioned report has been prepared by CIC independent of the influence of the Company and other interested parties. CIC’s services include, among others, industry consulting, commercial due diligence and strategic consulting. Except as otherwise noted, all of the industry related data and forecasts contained in this section and elsewhere in this Document are derived from the CIC Report.

CIC conducted both primary and secondary research using a variety of resources. Primary research involved consumer survey, interviewing key industry experts and leading industry participants. Secondary research involved analyzing data from various publicly available data sources, such as the National Bureau of Statistics of China, information released by other Chinese government authorities, annual reports published by industry participants, industry organizations, as well as CIC’s internal database.

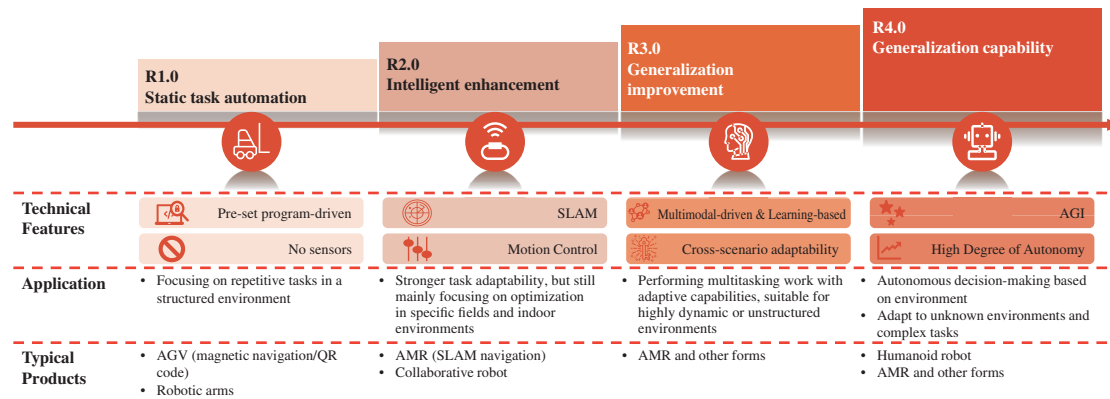
The market projections in the commissioned report are based on the following key assumptions: (i) that the overall global social, economic and political environment is expected to maintain a stable trend over the next decade; (ii) that related key industry drivers are likely to continue driving growth in the industry during the forecast period; and (iii) that there is no extreme force majeure or set of industry regulations in which the market situation may be affected either dramatically or fundamentally.

Our Directors confirm that, after making reasonable enquiries, there is no material adverse change in the market information since the date of the CIC Report which may qualify, contradict or have an impact on the information in this section.

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Evolution of Global Intelligent Robotics Industry

The intelligent robotics industry is rapidly advancing, driven by changes in global labor dynamics, rising demand for automation and operational efficiency, and continued breakthroughs in AI technologies, particularly large models. As AI becomes more deeply integrated with advanced manufacturing, intelligent robots are increasingly serving as a core enabler of productivity, resource optimization and service quality improvement across industrial, warehousing and commercial settings. As robots evolve from fixed, rule-based machines to systems capable of multimodal perception, real-time decision-making and adaptive execution, the industry is moving toward greater autonomy and broader general-purpose application. The evolution of global intelligent robot industry can be categorized into four key phases:



Source: CIC

Phase 1.0 – Static Task Automation

In Phase 1.0, intelligent robots were defined by fixed-function automation with no perception or autonomous capabilities. Robots in R1.0 rely entirely on pre-set program logic, with no environmental perception, adaptive capability or autonomy. Their actions follow fixed instructions, and they are unable to react to unexpected changes in the operating environment. Deployment of robots in R1.0 is limited to repetitive, structured tasks carried out in stable and predictable environments where workflows do not vary. Representative products include AGVs guided by magnetic strips or QR codes operating on fixed routes, as well as basic robotic arms performing repetitive handling or assembly tasks.

Phase 2.0 – Intelligent Enhancement

In Phase 2.0, robots begin to incorporate environmental perception systems and enhanced human-robot interaction capabilities. Sensor inputs allow limited adaptation to immediate surroundings, though functions remain largely constrained to defined tasks. Robots demonstrate stronger task adaptability but remain focused on use cases within specific fields. With the maturation of 2D environmental perception technologies, sensor inputs enabled robots to achieve limited adaptation to their immediate surroundings, typically within indoor environments. Typical product types include AMRs using SLAM-based movement and collaborative robots capable of operating safely alongside humans.

The intelligent robotics industry is evolving from Phase 2.0 toward the Phase 3.0. Based on the technical characteristics and current commercialization status of our major products, including our AMRs, forklift-type robots, outdoor mobile robots and mobile manipulation robots, our products exhibit key Phase 3.0 characteristics, including multimodal perception, adaptive task execution, cross-scenario deployment and large-scale fleet coordination capabilities. We are among the industry leading players progressively transitioning into Phase 3.0.

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Phase 3.0 – Generalization Improvement

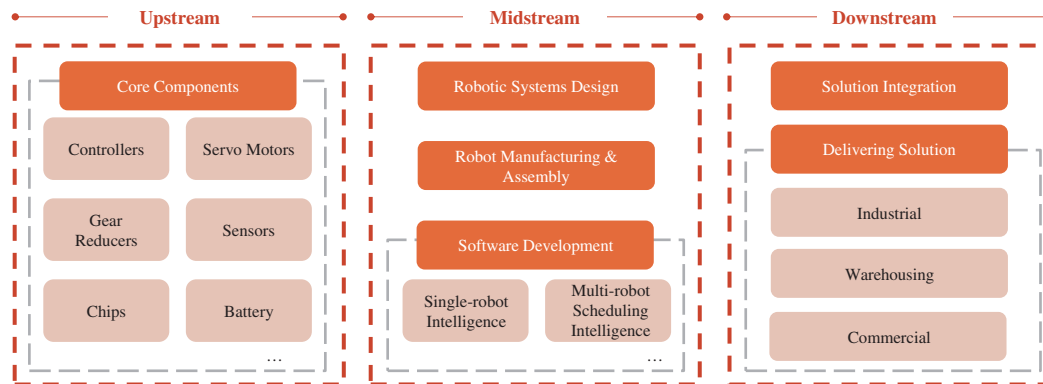
Phase 3.0 marks the shift toward multimodal-driven and learning-based intelligence. Supported by the maturation of 3D environmental perception and multi-sensor fusion technologies, robots demonstrate cross-scenario generalization and multitasking capabilities, enabling them to adapt their strategies based on richer perception and deeper contextual understanding. Robots in Phase 3.0 can perform multitasking work and exhibit adaptive behavior suitable for dynamic or partially unstructured environments across industrial, warehousing and commercial settings, enabling seamless operation across both indoor and outdoor scenarios. Typical product types include AMRs, mobile manipulation robots, wheeled humanoid robots and other forms equipped with higher-level multimodal capabilities.

Phase 4.0 – Generalization Capability

In Phase 4.0, with the maturation of AGI-related technologies, robots gain advanced autonomous reasoning, continuous learning and self-optimization capabilities. They can operate independently in unfamiliar environments and make real-time decisions based on complex contextual information. Robots in Phase 4.0 can be deployed in unknown or highly variable environments to execute complex tasks requiring high levels of autonomy, flexibility and generalization. Typical product types include humanoid robots and next-generation AMRs designed as embodied intelligence agents with higher generalized adaptability suitable for a wide range of enterprise and consumer applications.

Industry Value Chain of Intelligent Robotics Industry

Intelligent robotics industry can be broken down into three primary segments within the value chain: (i) the development of core components (including core hardware such as controllers, sensors, servo motors and others), (ii) the design and development, manufacturing, and assembly of complete robotic systems as well as software development such as single-robot and multi-robot scheduling intelligence, and (iii) solution integration and downstream application of robotic systems into specific industries and end customers.



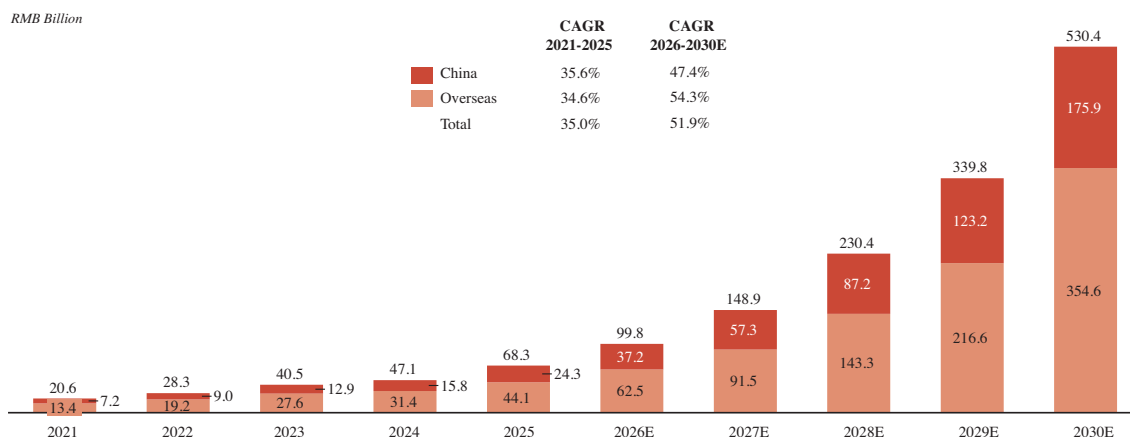
Source: CIC

The intelligent robotics industry chain encompasses a complete closed loop from component manufacturing to system integration and end-use application deployment, characterized by high technological intensity and system complexity. The upstream consists of component suppliers, while the midstream involves the design and development, manufacturing, assembly, and integration of complete intelligent robotic systems; the downstream provides system integration and delivery services tailored to customers in diverse scenarios. We operate primarily in the midstream and downstream segments of the intelligent robotics value chain, and selectively participate in the upstream segment through certain self-developed core components.

Market Size of Global and China Intelligent Robotics Industry

Driven by advancements in technologies, decreasing application costs and expanding application scenarios, the global intelligent robotics industry has entered a period of rapid growth. The chart below illustrates the growth of the global intelligent robotics market in terms of sales revenue in China and the rest of the world.

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Source: CIC

Key Drivers and Trends for Intelligent Robotics Industry

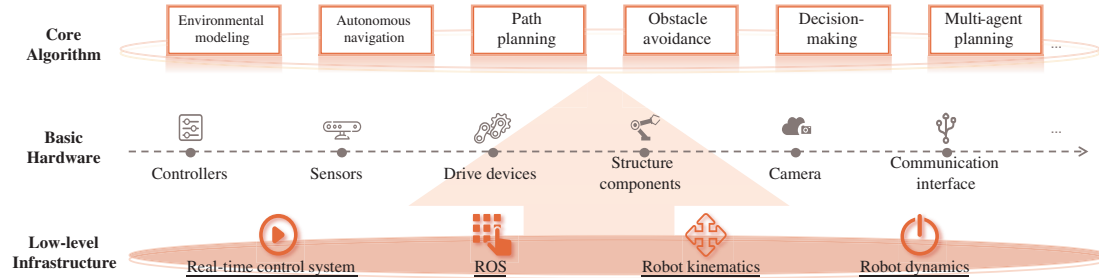
- AI breakthroughs, led by large models, are significantly enhancing generalization capabilities.** Rapid progress in AI, led by multimodal large models, is enabling intelligent robots to move beyond the limitations of task-specific programming and fixed operating conditions. By combining multimodal perception, imitation learning and reinforcement learning, robots are becoming increasingly capable of adapting to different environments, industry workflows and task requirements, enabling more flexible and autonomous execution. Building on these AI advancements, industry leading players, including the Company, are progressively transitioning into Phase 3.0.
- Hardware, software and the supply chain are becoming more mature and cost-efficient.** The growing maturity of the robot supply chain, particularly in China, has played a key role in reducing costs and improving production efficiency. With the localization of key components and the scale-up of production, hardware costs have significantly decreased, and lead times have shortened. On the software side, the rapid iteration of AGI algorithms and the rise of open-source ecosystems have improved the stability of robotic systems and lowered development costs. These factors combined have strengthened the competitive position of intelligent robots in the marketplace and laid a solid foundation for sustainable industry growth.
- Global demand for automation is rising amid tightening labor supply and increasing labor costs.** Companies across manufacturing and services face growing pressure to improve efficiency while managing rising labor expenses. At the same time, demographic changes, such as global aging, are intensifying labor shortages. By 2050, the population aged 65 and above is expected to nearly double from 800 million in 2024 to 1.6 billion, while the share of working-age individuals continues to decline. As customer needs also become more diverse and customized, businesses require greater flexibility and intelligence in their operations, making intelligent robots increasingly important for maintaining productivity and operational stability.
- Governmental Policy Support.** Governments worldwide are providing significant support to the intelligent robotics industry through favorable policies and initiatives that promote R&D, manufacturing and application deployment of robotics and AI-enabled technologies, providing policy assurance and resource allocation to accelerate industry development. For instance, China’s “14th Five-Year Plan” prioritizes smart manufacturing, the U.S. promotes robotics innovation through the “National Robotics Initiative,” and the European Union’s “Horizon 2020” program provides substantial funding for robotics research. These government-backed efforts help fuel the development and widespread adoption of intelligent robots, particularly in industries such as manufacturing, healthcare and logistics through offering financial incentives, tax benefits and research support.

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OVERVIEW OF INTELLIGENT MOBILE ROBOTICS INDUSTRY

Introduction of Intelligent Mobile Robots

Intelligent mobile robots integrate advanced algorithms and technologies to enable autonomous navigation, path planning, obstacle avoidance, decision-making and multi-agent planning.



Source: CIC

Based on form factors and functional characteristics, intelligent mobile robots can be broadly categorized into: (i) autonomous mobile robots, or AMRs, indoor intelligent mobility platforms that enable point-to-point material transport by using a mobile chassis capable of carrying diverse payload carriers and task-specific modules; (ii) forklift, autonomous mobile robot that replicates forklift functions to autonomously lift and move palletized goods; and (iii) outdoor mobile robots, intelligent mobile robot for high load capacity in outdoor scenarios.

These product types offer complementary strengths in payload capacity, operational precision and environmental adaptability, together forming full-scenario, end-to-end solutions that address the diverse needs of downstream users.

Value Chain of the Intelligent Mobile Robotics Industry

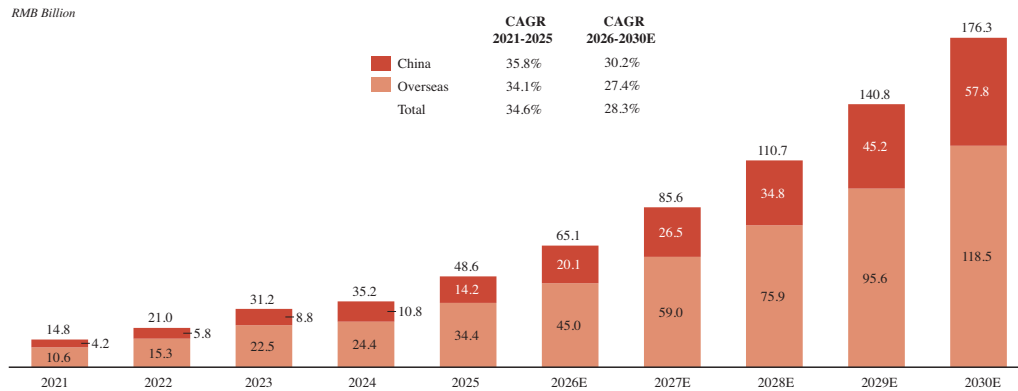
Intelligent mobile robotics market can be categorized by downstream application scenarios into industrial, warehousing and commercial settings. Industrial scenarios refer to operating environments within manufacturing systems where robots participate directly or indirectly in core production processes such as fabrication, processing, inspection and assembly, serving high-end manufacturing sectors including electronics, automotive, new energy, semiconductor and others. Warehousing scenarios include storage, sorting and goods-flow operations within the logistics supply chain, primarily serving industries such as e-commerce, apparel, fast-moving consumer goods and third-party logistics. Commercial scenarios encompass environments that interface directly with end customers or public services, including retail stores, hotels, restaurants and other service venues.

Among these application categories, industrial scenarios impose significantly higher requirements on precision, task execution accuracy, response timeliness and system reliability. In workflows that are tightly integrated with production lines, such as material docking or line-side delivery, robots must meet stringent performance standards, as any operational error may result in production downtime or quality defects. Consequently, companies focused on industrial intelligent mobile robots typically build deep capabilities in perception, motion control and system integration, which in turn establish a strong foundation for expanding into warehousing and commercial applications.

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Global and China Intelligent Mobile Robotics Market

The chart below illustrates the size of the global intelligent mobile robotics market in terms of sales revenue in China and the rest of the world.

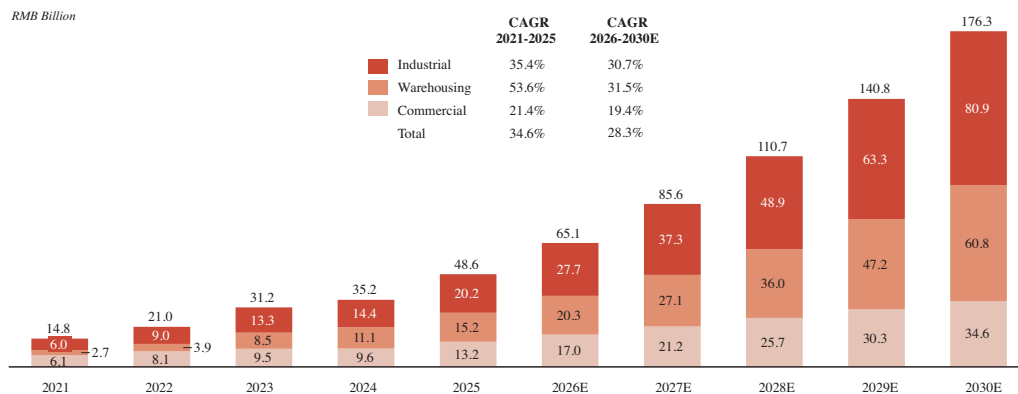


Note: intelligent mobile robots do not include mobile manipulation robots that integrate operable robotic arms on a mobile chassis.

Source: CIC

By application scenario, industrial scenario applications remain the dominant and most stable source of downstream demand for intelligent mobile robots. Typical industrial sectors where intelligent robots are widely deployed include electronics, automotive, new energy, semiconductor, pharmaceutical and others.

The chart below illustrates the size of the global intelligent mobile robotics market by application scenarios in terms of sales revenue.



Source: CIC

Key Drivers and Trends for the Intelligent Mobile Robotics Industry

- Continuous innovation by leading manufacturers is accelerating technology upgrades and expanding product categories.** Industry leaders are building on their strengths in system integration, software algorithms and ecosystem development to drive continuous product innovation. Their efforts are helping intelligent mobile robots evolve from standardized offerings into multi-scenario solutions, broadening application coverage and speeding up adoption across downstream industries.
- Chinese manufacturers are well-positioned to capture global growth opportunities.** The global market for intelligent mobile robots is expanding quickly, supported by rising demand for intelligent upgrades in industrial, warehousing and commercial environments. Chinese manufacturers benefit from strong cost efficiency, deep supply-chain integration and fast engineering execution. These advantages are enabling them to enhance product competitiveness and grow their share in overseas markets.

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- **Advancements in generalization capabilities are enhancing industry penetration.** As robot hardware architectures become more modular and algorithms become increasingly generalized, intelligent mobile robots are evolving from task-specific products into reusable and scalable universal mobile platforms. The integration of large-model, reinforcement learning and multimodal perception significantly enhances robots’ ability to perceive their environment, plan tasks and make real-time decisions. These capabilities enable transferable planning and decision-making across scenarios, allowing robots to adapt quickly to diverse environments and address more complex operational requirements. The resulting improvements in versatility and ease of deployment are driving broader adoption of intelligent mobile robots across industrial, warehousing and commercial settings.

OVERVIEW OF EMBODIED INTELLIGENCE ROBOTICS INDUSTRY

Introduction of Embodied Intelligence Robots

Embodied intelligence robots are intelligent robots designed with biomimetic forms and locomotion mechanisms inspired by humans or animals, integrating AI, perception systems and embodied control technologies. They are characterized by multi-degree-of-freedom movement, dexterous manipulation, environmental perception, task understanding, autonomous planning and adaptive execution. Based on form and locomotion, they are generally classified into humanoid, mobile manipulation and quadruped robots. Humanoid robots can be further divided into wheeled and legged types, with the former emphasizing efficient and stable mobility and the latter relying on bionic walking structures for autonomous movement.

Global and China Embodied Intelligence Robotics Market

Driven by advancements in large AI models and the accumulation of diverse datasets, the global embodied intelligence robot market is experiencing rapid growth. In terms of sales revenue, the global embodied intelligence robotics market reached RMB9.9 billion in 2025 and is expected to grow to RMB326.2 billion by 2030, at a CAGR of 94.5% from 2026 to 2030. In China, the embodied intelligence robot market reached RMB5.9 billion in 2025 and is projected to increase to RMB105.6 billion by 2030, representing a CAGR of 71.7% from 2026 to 2030. The chart below illustrates the size of the global embodied intelligence robotics market in terms of sales revenue in China and the rest of the world.

Commercial Potential of Wheeled Humanoid Robots

In environments such as industrial, warehousing and commercial service locations, where floors are generally level and pathways are well defined, wheeled humanoid robots typically offer higher stability, energy efficiency and deployment feasibility in environments with flat surfaces and relatively standardized routes, thereby fulfilling the vast majority of operational tasks. They offer clear advantages in cost-effectiveness, technological maturity and feasibility of deployment compared with alternative forms.

During technological evolution and industrial adoption, wheeled humanoid robots exhibit strong synergies with intelligent mobile robots that are already widely deployed:

- **Technical synergy:** Wheeled humanoid robots can reuse and upgrade the chassis and controller systems developed for intelligent mobile robots, allowing for faster iteration and lower development costs.
- **Application synergy:** Wheeled humanoid robots and intelligent mobile robots can operate together under a unified intelligent scheduling system, forming flexible, full-facility automation solutions that enhance overall operational efficiency and automation levels.

Key Drivers and Trends for the Embodied Intelligence Robotics Industry

The embodied intelligence robotics industry is being driven by the continued maturation of core hardware and software technologies, including mobile chassis, localization and integrated control systems, together with engineering know-how from the intelligent mobile robot sector, which is improving stability, scalability and performance in complex, unstructured environments. At the same time, stronger upstream component performance, a more developed supply chain

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and greater collaboration across the value chain are reducing manufacturing and deployment costs and accelerating the transition from laboratory prototypes to large-scale commercialization. Meanwhile, advances in scheduling algorithms and swarm intelligence are enabling embodied intelligence robots to evolve from standalone units to coordinated multi-robot systems with unified task allocation, path planning and real-time collaboration, enhancing operational efficiency and resource utilization. As perception, decision-making and control capabilities continue to improve, embodied intelligence robots are also demonstrating greater cross-scenario generalization and adaptability, supporting their rapid expansion from research settings into industrial, warehousing and commercial applications.

COMPETITIVE LANDSCAPE

The global intelligent mobile robotics market is intensely competitive, with the top ten players accounting for only approximately 12.0% of the total market share by revenue in 2025. This fragmentation is largely due to the highly dispersed downstream application scenarios of intelligent robots across varied industrial sectors and specific factory requirements. By revenue in 2025, we ranked top ten globally with an estimated market share of approximately 1.0%. The table below sets forth information about the top ten players in the global intelligent mobile robotics industry in 2025 in terms of revenue.

Rank	Company	The revenue of intelligent mobile robotics (RMB in hundred million), 2025	Market share
1	Company A ¹	18.8	4%
2	Company B ²	9.6	2%
3	Company C ³	6.3	1%
4	Company D ⁴	4.5	1%
5	Company E ⁵	4.2	1%
6	Company F ⁶	4.0	1%
7	Company G ⁷	3.4	1%
8	Company H ⁸	3.3	1%
9	Company I ⁹	2.9	1%
10	The Company	2.6	1%

Source: Annual reports, expert interviews, CIC

Notes:

1. Company A, founded in 2016 and headquartered in Chinese Mainland, is a subsidiary of a company listed on the Shenzhen Stock Exchange. It is a global leader in machine vision and mobile robotic solutions, primarily serving industrial applications.
2. Company B, founded in 2016 and headquartered in Chinese Mainland, it is a privately held company and a global leader in commercial service robots, primarily serving delivery applications in catering, hotel, and healthcare sectors.
3. Company C, founded in 2017 and headquartered in Chinese Mainland, it is a privately held company and a global leading autonomous mobile robot enterprise, primarily serving new energy applications.
4. Company D, founded in 2016 and headquartered in Chinese Mainland, it is a privately held company and a global leading autonomous mobile robot enterprise focusing on unmanned forklifts, primarily serving industrial and warehousing applications.
5. Company E, founded in 2010 and headquartered in Chinese Mainland, it is a privately held company and a global leader in commercial service robots, primarily serving delivery and cleaning applications across various industries.
6. Company F, founded in 2013 and headquartered in Chinese Mainland, it is a privately held company that focuses on commercial cleaning robots, primarily serving digitalized cleaning applications.
7. Company G, founded in 2013 and headquartered in Denmark, is a subsidiary of a company listed on the New York Stock Exchange. It is a global leader in AMR, used across a wide range of industries.
8. Company H, founded in 2003 and headquartered in the United States, is a privately held company and a global leading autonomous mobile robot enterprise, primarily serving industrial applications.
9. Company I, founded in 2020 and headquartered in Chinese Mainland, is a company listed on the Hong Kong Stock Exchange and a global leader in mobile robotic solutions and robotic controllers, primarily serving industrial applications.

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Industrial scenarios have nowadays become one of the major application scenarios for intelligent mobile robotics market, with Chinese manufacturers have become increasingly influential in the global industrial mobile robotics market. The top five domestic players accounted for approximately 15% of the global market in 2025. According to CIC, we were one of the top ten players globally and ranked fourth among all domestic players in industrial intelligent mobile robotics industry in terms of revenue in 2025. The table below sets forth information about the top five domestic players in the global industrial intelligent mobile robotics industry in 2025 in terms of revenue.

Rank	Company	The revenue of industrial intelligent mobile robotics ¹	Market share
1	Company A	14.9	7%
2	Company C	6.3	3%
3	Company I	2.9	1%
4	The Company	2.6	1%
5	Company J ²	2.6	1%

Source: Annual reports, expert interviews, CIC

Notes:

1. The revenue of industrial intelligent mobile robotics (RMB in hundred million) in 2025
2. Company J, founded in 2016 and headquartered in Chinese Mainland, it is a privately held company and a global leader in autonomous mobile robots, primarily serving industrial applications such as electronics, automotive and semiconductors.

Among the top five players in the global intelligent mobile robotics industry, we are the only one with full-scenario coverage across indoor and outdoor task execution spanning a wide range of industrial and commercial settings, supported by high-precision positioning and operation accuracy and the widest payload range. The table below compares parameters such as indoor/outdoor capability, scenario coverage, positioning accuracy, operation accuracy and payload capacity among the top five players in the global intelligent mobile robotics market:

Company	Indoor ¹	Outdoor ²	Industrial	Warehousing	Commercial	Positioning Accuracy	Operation Accuracy	Payload	Fleet Size ⁴
The Company	✓	✓	✓		✓	±2mm	±1mm	400~30,000kg	~2,500
Company A	✓		✓	✓		±5~±10mm	±2~±10mm	30~10,000kg	~2,000
Company C	✓		✓		✓	±10mm	±5mm	60~3,000kg	~600
Company D	✓		✓	✓		±10mm	±3mm	1,400~4,000kg	~1,000
Company G	✓		✓	✓		Centimeter-level	±3mm	200~15,00kg	~100
Company H	✓		✓	✓		Centimeter-level	N.A.	1,500~5,000kg	N.A.
Company I	✓		✓			±2~±5mm	±2mm	300~3,000kg	N.A.

Source: CIC

Notes:

1. Indoor refers to operating environments located within enclosed building structures with full overhead coverage and clearly defined physical boundaries, such as factories, warehouses, restaurants, hotels and office buildings.
2. Outdoor refers to operating environments exposed to natural conditions without full artificial shelter, such as industrial parks, ports and other public outdoor areas.
3. Definitions, test conditions and applicable scenarios for such metrics may vary depending on product models, configurations and customer site environments.
4. Fleet size refers to the maximum number of robots that can be centrally managed or scheduled in a single deployment scenario.

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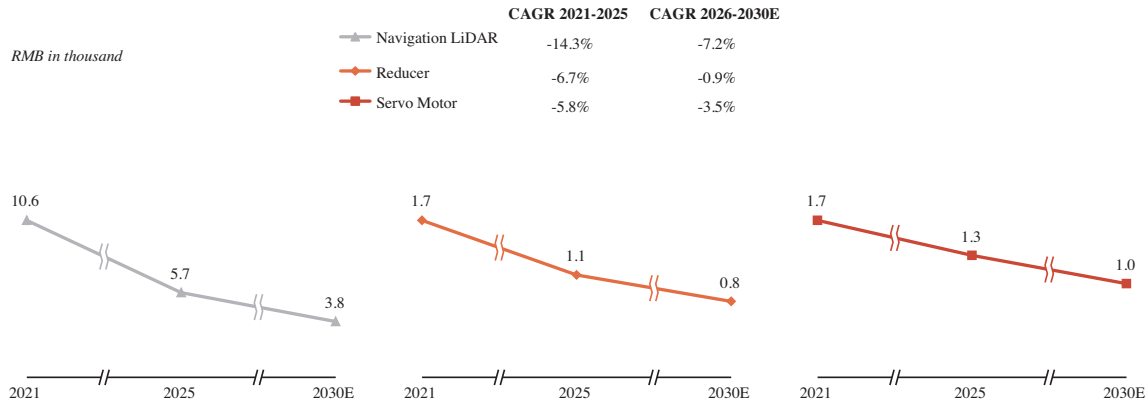
Key Success Factors and Industry Competitive Barriers

- ***R&D and innovation capabilities in core technologies.*** Sustained independent R&D and continuous iteration in core technologies, such as perception algorithms, multi-sensor fusion, high-precision positioning, motion control in dynamic environments, mechanical engineering and structural design, form a fundamental competitive barrier in the intelligent mobile robot industry. Companies that are able to integrate AI-driven capabilities into their products can meaningfully enhance robot performance and operational efficiency, thereby materially improving productivity for downstream users and establishing a clear technological advantage.
- ***Integrated solution capabilities.*** Competitiveness in the industry also depends on the ability to provide integrated hardware–software solutions and deliver full-stack product portfolios spanning hardware platforms, software systems and end-to-end industry solution delivery. By incorporating swarm intelligence and multi-robot collaborative scheduling, leading companies are able to build comprehensive solutions that cover the full range of scenarios within production systems, creating strong differentiation and higher customer switching costs.
- ***Broad downstream application experience.*** Extensive deployment experience across multiple industries enables companies to achieve stable operation and rapid implementation in unstructured or variable environments. The ability to transfer technological know-how from one industry to another creates meaningful spillover advantages, facilitating broader cross-scenario adoption and allowing companies to scale their solutions across a diverse set of use cases.
- ***Continuous accumulation of ecosystem resources.*** Active participation in the development of the industry ecosystem, together with close collaboration with upstream and downstream partners, promotes technological standardization and application innovation. By building an open and collaborative ecosystem and working closely with leading downstream customers, companies can continuously expand their industry influence, strengthen customer stickiness and reinforce their competitive positioning.
- ***International expansion supported by localized operating capabilities.*** An international business footprint allows companies to gain the trust of global customers and obtain authoritative international certifications, which together strengthen brand recognition and credibility. Localized operating capabilities further enhance service delivery and customer support, creating an additional competitive barrier for new entrants.
- ***Supply chain management capability.*** The intelligent mobile robot supply chain is complex, encompassing sensors, controllers, actuators, algorithm systems and full-system integration. Effective coordination across these modules is essential to ensure product competitiveness and supply stability, forming a critical barrier to entry for participants without mature supply chain management capabilities.

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COST ANALYSIS OF ROBOT CORE COMPONENTS

The development and performance of intelligent mobile robots are closely tied to the maturity of their core component supply chain. The core components include controllers, LiDAR units, 3D vision sensors, servo motors, reducers and power batteries. The selection and performance of these core components directly affect the comprehensive competitiveness of robots in terms of intelligence level, operating efficiency, endurance, safety performance and other dimensions. Among these core components, LiDAR, reducer and servo motor account for a relatively high share of total system cost.



With continued technological progress, the growth of domestic component manufacturers and greater industry standardization, the costs of key components have declined steadily, even as their performance and reliability continue to improve. At the same time, advances in battery technologies and the adoption of sophisticated battery management systems have extended single-cycle operating time and improved long-duration safety and stability. These dual trends of lower cost and higher performance are accelerating the adoption of intelligent mobile robots across a wider range of industries and supporting the broader shift toward intelligent automation.