



China Insights Consultancy

Industry Report on Global Robot Industry



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CIC introduction, methodologies, and assumptions

China Insights Consultancy was commissioned to conduct research, provide an analysis of, and produce a report on Global Robot Industry. The commissioned report has been prepared by China Insights Consultancy independent of the influence of Seer Robotics and other interested parties.

China Insights Consultancy is an investment consulting company initially established in Hong Kong. Its services include industry consulting services, commercial due diligence, strategic consulting, and so forth. Its consultant team has tracked the latest market trends in TMT, consumer goods, healthcare, marketing and advertising, culture and entertainment, energy and industry, agriculture, chemicals, finance and professional services, and transportation. It possesses the most relevant and insightful market intelligence regarding these industries.

China Insights Consultancy undertook both primary and secondary research using various resources. Primary research involved interviewing key industry experts and leading industry participant. Secondary research involved analyzing data from multiple publicly available data sources, including the National Bureau of Statistics of China, Chinese government releases, annual reports published by relevant industry participants and industry associations, China Insights Consultancy's own internal database, etc.

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 on 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. All forecasts concerning market sizes are based on the general economic conditions as of the Latest Practicable Date.

All statistics are reliable and based on information available as of the date of this report. Other sources of information include those from the government, industry associations, and market participants. These various entities may have provided some of the information on which the analysis or its data is based.

All the information about Seer Robotics has been sourced from Seer Robotics's own audited report or management interviews. China Insights Consultancy is not responsible for verifying the information obtained from Seer Robotics.

Terms and abbreviations(1/4)

Robot: programmable, actuated mechanism capable of movement with a certain degree of autonomy, designed to operate in specific environments to perform predefined tasks.

Intelligent Robot: Robots equipped with AI and machine learning technologies, enabling human-like cognitive and physical abilities. They can operate autonomously and adapt to complex environments, making decisions and performing tasks without human intervention. 智能机器人

Intelligent Robot Control System: Intelligent Robot Control System, often referred to as the "robot brain," includes an embedded controller within the robot itself and cloud-based software that leverages intelligent scheduling/fleet management and optimization algorithms to assign tasks, facilitating multi-robot coordination. 智能机器人控制系统

Robot Controller: Robot controller integrates intelligent algorithms such as motion control and SLAM navigation, while managing various sensors and actuators to enable autonomous operation of the robot. 控制器

Laser-Based Localization Algorithm: A technique used by robots to determine their position and orientation within a known environment using data from laser range finders. 激光定位算法

Mecanum Wheel Control Algorithm: A method used to control robots equipped with Mecanum wheels, which allow omnidirectional movement. 麦克纳姆轮控制算法

Gear Reducer: A mechanical device used to decrease the speed of a motor and increase the output torque through a gear system, which can enhance the force exerted by the motor.

Operational Control Drive System: The integrated hardware and software system responsible for executing motion commands and controlling the physical actions of a robot. 执行系统

Path Planning Algorithm: A computational method used to determine an optimal or feasible route for a robot to move from a starting point to a target location while avoiding obstacles and satisfying constraints such as safety, efficiency, and environmental dynamics. 路径规划算法

Terms and abbreviations(2/4)

Servo Motor: A rotary or linear actuator designed for precise control of position, speed, and torque, typically used in control systems where high accuracy and responsiveness are required. 驱动器

Positioning and Navigation System: A technical system that enables a robot to determine its spatial location and plan its movement within an environment. 定位导航系统

Intelligent Robot Open Platform: a robotic platform that connects core component suppliers, manufacturers, integrators, and end users to provide comprehensive development and deployment solutions. By offering toolchains and technical services, they help lower development barriers and promote collaborative growth within the ecosystem. 智能机器人开放平台

Vertically Integrated Robot Company: Through acquisitions or in-house development, these companies integrate the full value chain - from core components to system integration and end applications - forming a closed, self-contained ecosystem. 智能机器人垂直整合厂商

SLAM: Simultaneous Localization and Mapping refers to a computational technique used by autonomous robots and vehicles to build or update a map of an unknown environment while simultaneously determining their own location within that map. 实时定位与地图构建

VLA: Vision Language Action refers to an AI framework that integrates visual perception, natural language understanding, and action planning. It enables robots or agents to interpret human instructions (language), perceive the environment (vision), and perform appropriate physical actions. 视觉-语言-动作算法

VLM: Vision-Language Model refers to a multimodal AI model trained to understand and generate both visual and textual information. VLMs serve as foundational models in tasks such as image captioning, visual question answering, and interactive robotics. 视觉语言模型

RL: Reinforcement Learning refers to a machine learning paradigm where an agent learns to make decisions by interacting with environment to maximize cumulative rewards. The agent takes actions, observes outcomes, and improves its policy through trial and error, often using feedback signals called rewards. 强化学习

Terms and abbreviations(3/4)

WCS: Warehouse Control System refers to a real-time software system responsible for directing the physical movement of goods within warehouses and distribution centers. It interfaces directly with automation hardware (e.g., AMR), executing instructions from higher-level systems like WES or WMS. 仓库控制系统

WES: Warehouse Execution System refers to a software system that manages and optimizes the operational processes within a warehouse or distribution center. It serves as a bridge between the Warehouse Management System (WMS) and the Warehouse Control System (WCS), coordinating and orchestrating the real-time execution of tasks and resources. 仓库执行系统

WMS: Warehouse Management System refers to a software system and associated processes that control and administer warehouse operations, including inventory tracking, order fulfillment, shipping, and receiving. 仓库管理系统

FMS: Fleet Management System Software refers to a software system used to coordinate and optimize the operation of a fleet of autonomous mobile robots (AMRs). It handles dynamic task assignment, path planning, traffic control, battery management, and status monitoring to ensure safe and efficient robot operations in logistics or manufacturing environments. 机器人调度系统

MES: Manufacturing Execution System refers to a real-time software system that monitors, tracks, documents, and controls the manufacturing process from raw materials to finished products. 制造执行系统

Mobile Manipulator refers to a robotic system that combines a mobile base with one or more robotic arms (manipulators), enabling it to navigate through environments and perform complex manipulation tasks. 复合机器人

Wheeled humanoid robot refers to a humanoid robot equipped with a wheeled base instead of bipedal legs. It retains a human-like upper body (torso, arms, and possibly a head) to interact naturally with tools, objects, or humans, while using wheels for more stable and energy-efficient movement. 轮式人形机器人

Terms and abbreviations(4/4)

3D NFL: 3D Natural Feature Localization 3D特征定位导航

AGI: Artificial General Intelligence 通用人工智能

CAGR: Compound Annual Growth Rate 复合年均增长率

PLC: Programmable Logic Controller 可编程逻辑控制器

QR Code: Quick Response Code 二维码

MPC: Model Predictive Control 模型预测控制

ERP: Enterprise Resource Planning 企业资源管理

Robots are becoming more diverse in form and function, enabling adoption across a wide range of scenarios and moving toward greater autonomy.

Definition of robot:

Robots are programmable, actuated mechanism capable of movement with a certain degree of autonomy, designed to operate in specific environments to perform predefined tasks.

Definition of Intelligent robot:

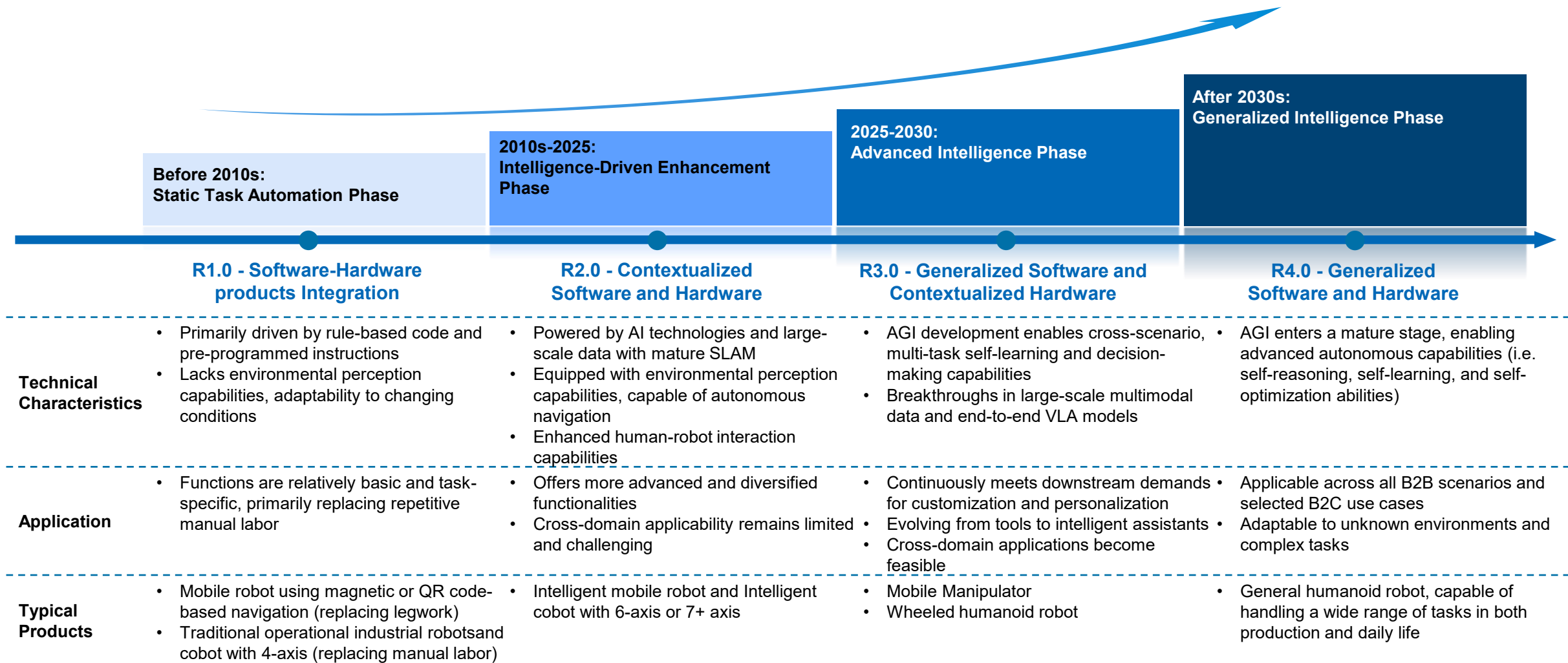
Intelligent robots are robots equipped with AI and machine learning technologies, enabling human-like cognitive and physical abilities. They can operate autonomously and adapt to complex environments, making decisions and performing tasks without human intervention.

Classification of Robots

	Mobile Robot	Cobot	Business Service Robot	Traditional Industrial Operational Robots	Other Specialized Robots
Definition	<ul style="list-style-type: none"> Autonomous machines capable of moving independently within environments, enabling adaptation to diverse environmental conditions. 	<ul style="list-style-type: none"> Robots working alongside humans in shared workspaces, prioritizing safety and adaptability for direct human-robot interaction without isolation. 	<ul style="list-style-type: none"> Robots specialized for 2B scenarios to deliver targeted professional services. 	<ul style="list-style-type: none"> Heavy, automated machines used in dedicated workspaces, typically separated from humans by safety barriers. 	<ul style="list-style-type: none"> Robots deployed in extreme environments with high autonomy and durability.
Application Scenarios	<ul style="list-style-type: none"> Warehouse fulfillment and industrial material handling across logistics, e-commerce, FMCG, 3C, automobile, new energy and etc. 	<ul style="list-style-type: none"> Industrial, medical (Surgical assistance, rehabilitation training), Service (Food service, retail, and hospitality). 	<ul style="list-style-type: none"> Medical, scientific research and education, logistics, retail and other business fields. 	<ul style="list-style-type: none"> Applied to industrial production tasks, including automotive, electronics, food processing and etc, 	<ul style="list-style-type: none"> Military operations, emergency rescue, space exploration and etc.
Major Functions	<ul style="list-style-type: none"> Autonomous navigation, path planning, obstacle avoidance, and item transportation/picking/sorting and etc. 	<ul style="list-style-type: none"> High-precision repetitive positioning for tasks like assembly and inspection; Safety protocols to halt operation upon human proximity detection. 	<ul style="list-style-type: none"> Surgical, rehabilitation, Teaching assistants, hospitality, cleaning, Last-mile delivery and etc. 	<ul style="list-style-type: none"> Operating repetitive tasks such as welding, handling, palletizing, packaging. 	<ul style="list-style-type: none"> Reconnaissance, bomb disposal, disaster response in earthquakes, fires.
Technical Barriers	<ul style="list-style-type: none"> High-precision SLAM for complex environmental challenges. Flexible hardware design and software algorithms to adapt varied environments and task demands. 	<ul style="list-style-type: none"> High-Precision position control and force control. Collision avoidance and human-robot interaction techniques. 	<ul style="list-style-type: none"> Integration of visual, tactile, and auditory sensors for enhanced perception; design optimization for diverse scenarios. 	<ul style="list-style-type: none"> Motion accuracy, control stability, industrial integration. 	<ul style="list-style-type: none"> Multi-sensor fusion, high-precision control. Robustness and safety in harsh environments.

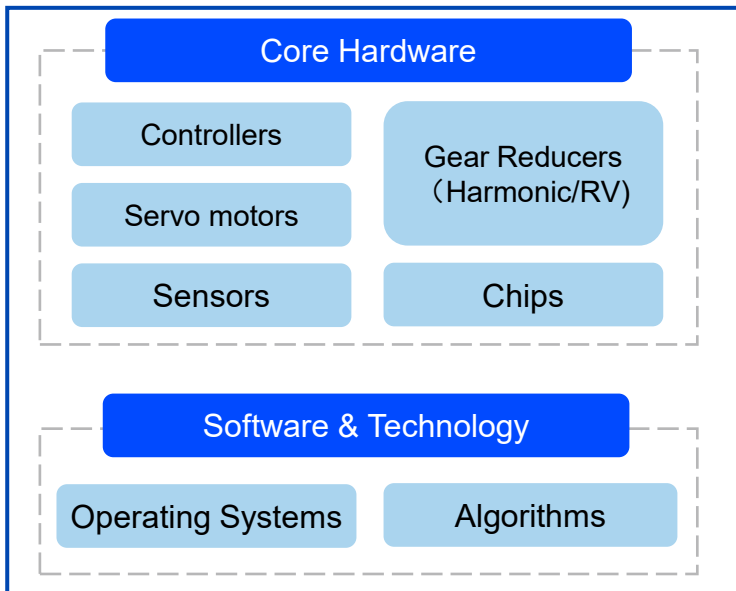
Advances in AI and machine learning are enhancing robots' autonomous decision-making and navigation, accelerating the global shift toward higher-level intelligence.

Development History of Global Robot Industry



As the robotic industry evolves rapidly, the traditional boundaries across the value chain are dissolving, with multi-role players and platform-based ecosystems driving complexity, integration, and innovation.

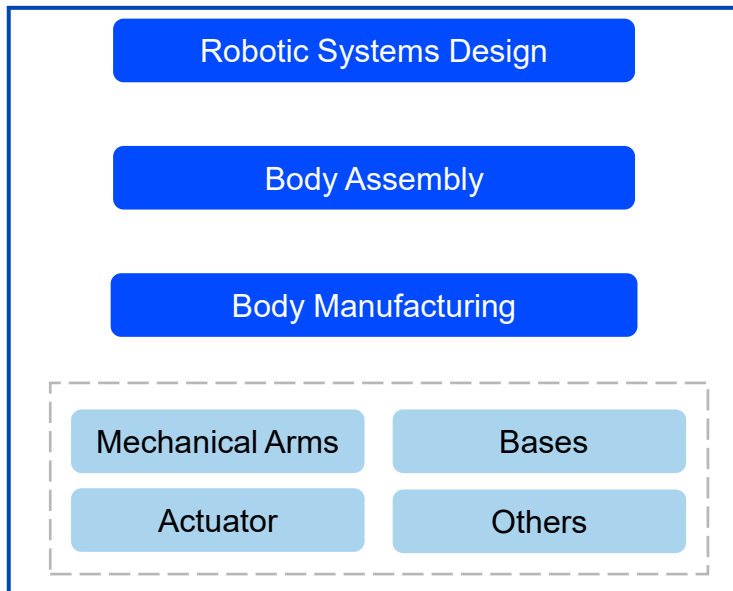
Upstream



Pain points

- Tens of thousands of core component manufacturers operate in a fragmented landscape.
- Precision reducers and high-performance controllers rely on Japanese/German companies.
- Core components account for 72% of total robot costs.

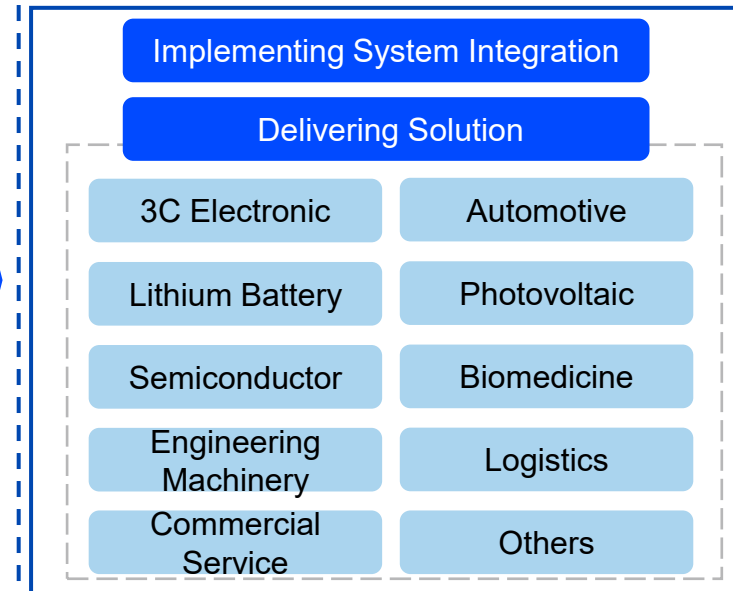
Midstream



Pain points

- Body manufacturing requires significant fixed asset investments (e.g., precision machining equipment), leading to high depreciation pressure.
- Over 800 Chinese integrators focus on simple tasks (e.g., palletizing), while foreign firms dominate high-value scenarios.

Downstream

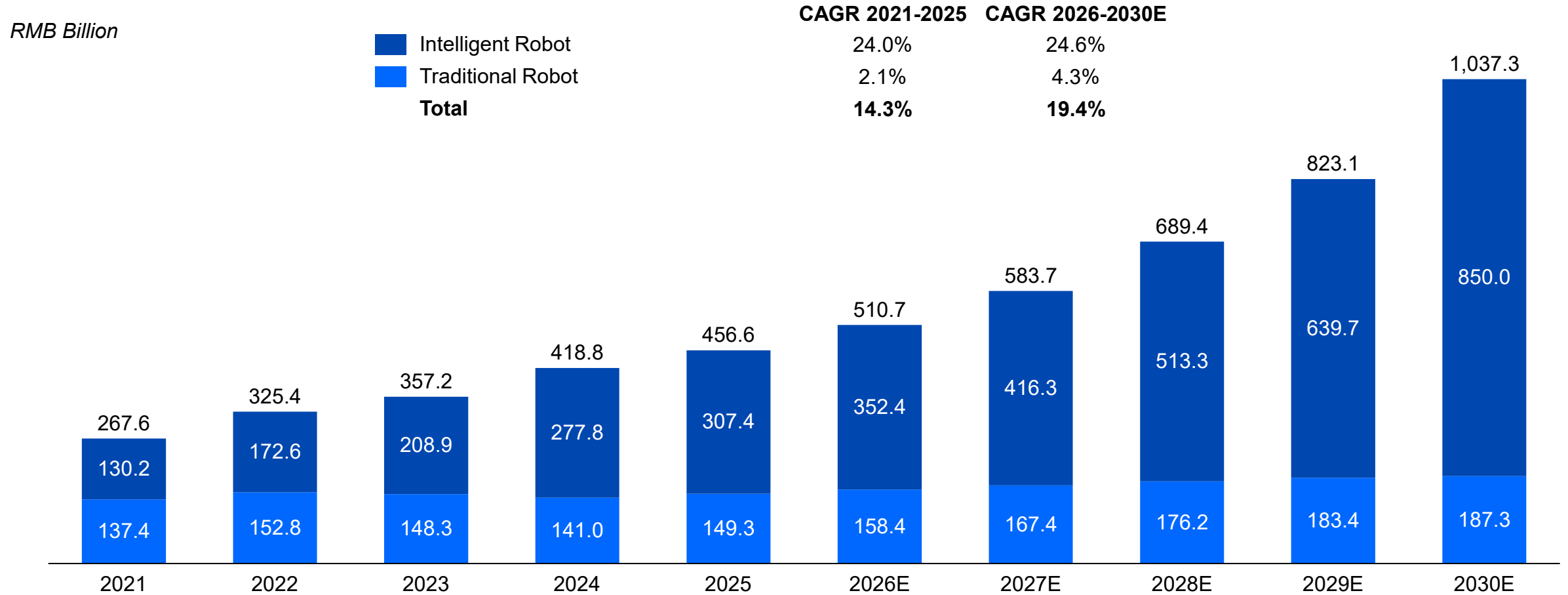


Pain points

- Scenario adaptation requires deep industry expertise and solving universal issues.
- There are over ten thousand downstream integrators, more than 90% of which are small and medium-sized enterprises with a scale of less than 100 million. Downstream integrators and end-users have increasingly urgent demands for personalized and customized hardware and software.

The global robot market is expanding, with Intelligent robots showing a particularly rapid growth rate. (1/2)

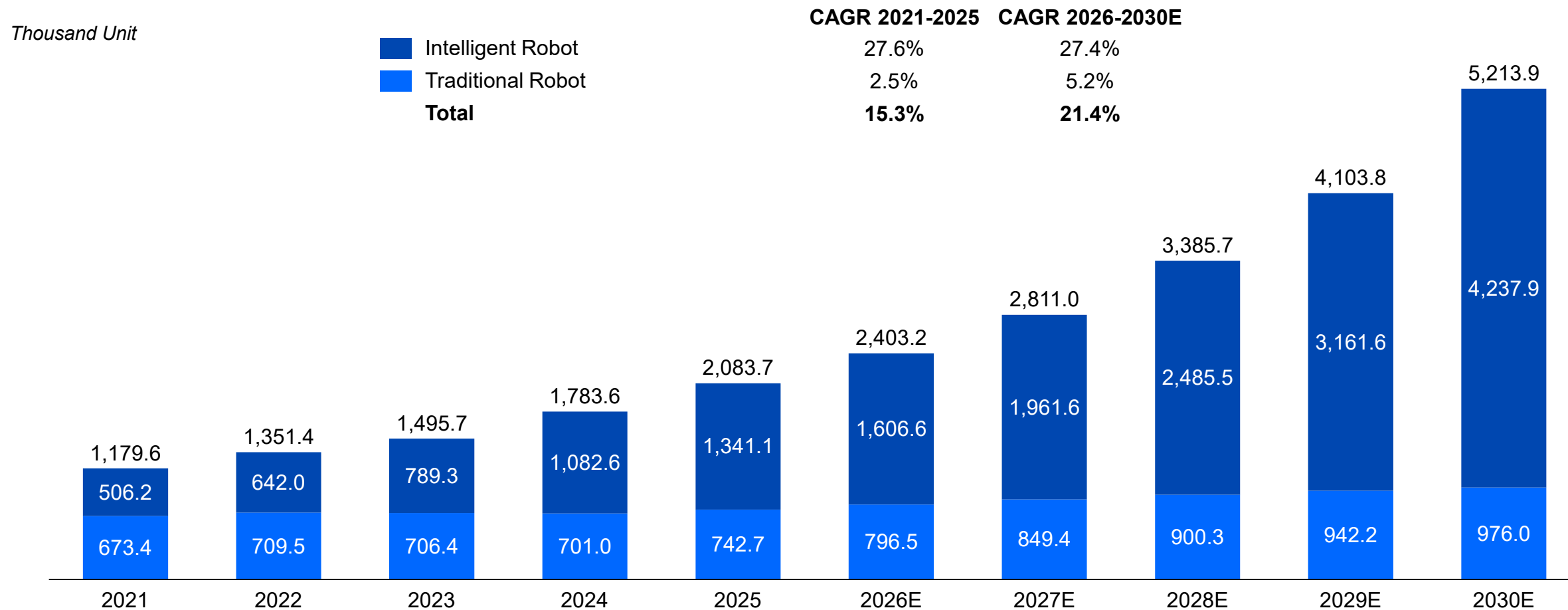
Global robot market size, in terms of sales revenue, 2021-2030E



Note: Global robot market here does not include robots to consumer for personal or family use. Others mainly refer to specialized robots.

The global robot market is expanding, with Intelligent robots showing a particularly rapid growth rate. (2/2)

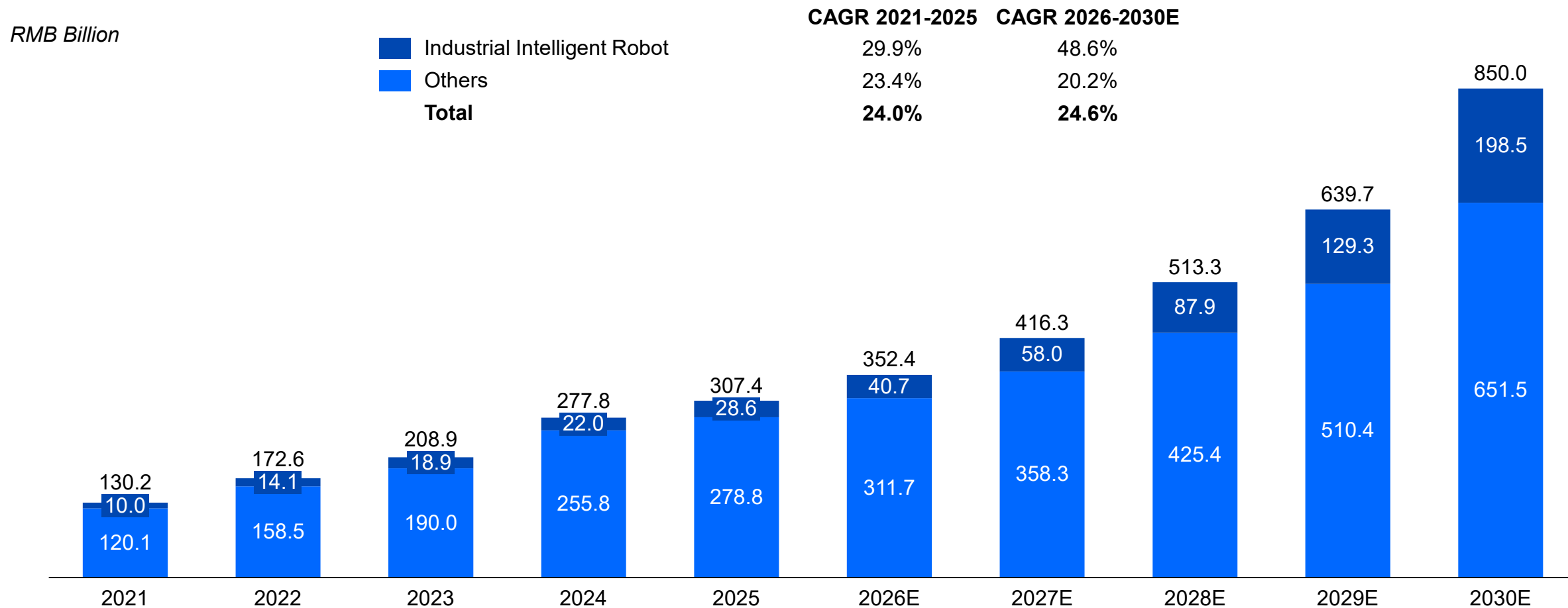
Global robot market size, in terms of sales volume, 2021-2030E



Note: Global robot market here does not include robots to consumer for personal or family use. Others mainly refer to specialized robots.

The global intelligent robot market is expanding, with industrial applications showing a particularly rapid growth rate. (1/2)

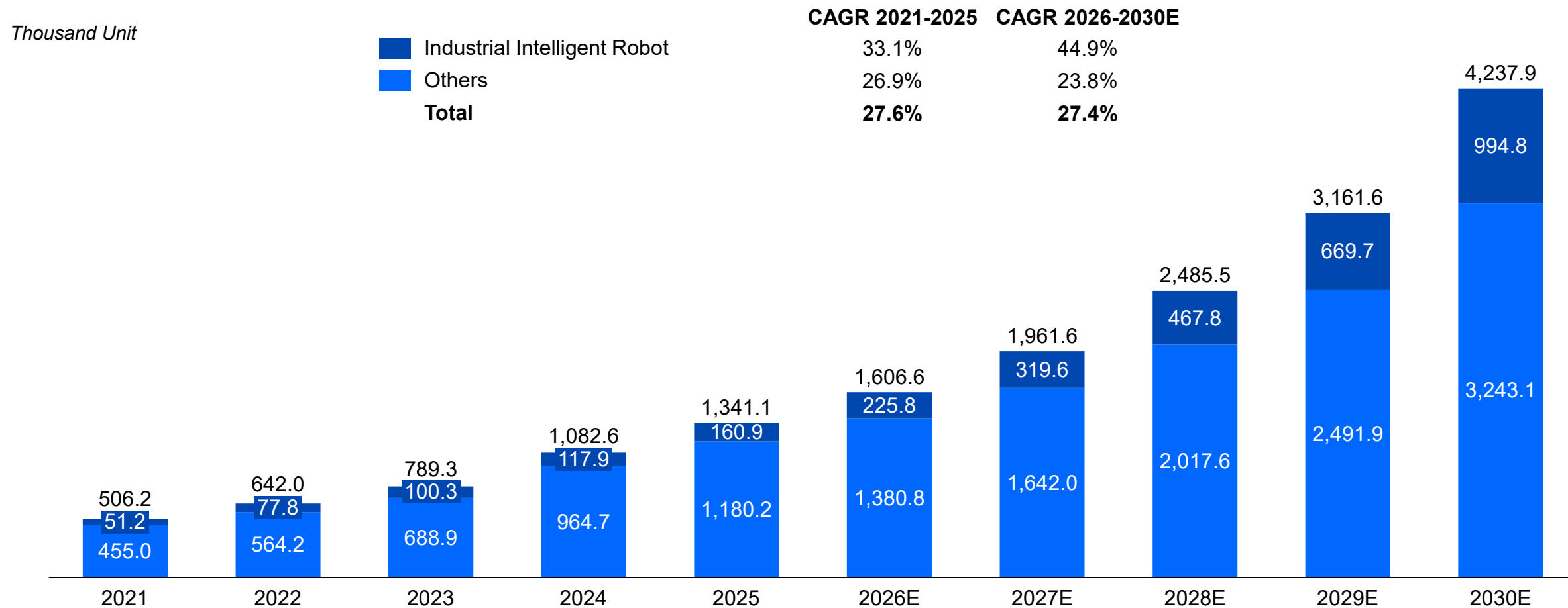
Global intelligent robot market size, in terms of sales revenue, by downstream scenarios, 2021-2030E



Note: Global robot market here does not include robots to consumer for personal or family use. Others mainly refer to commercial, warehousing logistics, inspection and other non-industrial scenarios..

The global intelligent robot market is expanding, with downstream industrial applications showing a particularly rapid growth rate. (2/2)

Global intelligent robot market size, in terms of sales volume, by downstream scenarios, 2021-2030E



Note: Global robot market here does not include robots to consumer for personal or family use. Others mainly refer to specialized robots.

The robot industry is propelled by advances in technologies, diversified customer demands, promotion by open platforms, and strong policy support across major economies.

I

Technological Development



- Advancements in artificial intelligence across natural language processing, computer vision, and motion control have significantly enhanced intelligent robots' capabilities in perception, decision-making, and execution. These improvements enable robots to handle more complex and precise task scenarios, elevating both their intelligence level and operational efficiency.

II

Upgrading and Diversification of Customer Demands



- Intensifying market competition and increasingly diverse customer demands are driving higher expectations for the generalization capabilities of intelligent robots, accelerating the expansion of product functionalities and application scenarios.

III

Promotion by Open Platforms



- The intelligent robot industry is shifting from a closed to an open ecosystem, with collaborative development across multiple stakeholders. Open platforms connect R&D, manufacturing, and application stages, fostering technological innovation and industrial upgrading, while lowering entry barriers for small and medium-sized enterprises and driving overall industry growth.

IV

Policy Support




- Governments around the world are introducing policies to support the development of the intelligent robot industry, providing policy assurance and resource backing to drive progress in R&D, manufacturing, and application.

Developing from physical tracks to SLAM, robot navigation technologies continuously enhance the automation and intelligence level of robots.

Development of robot navigation technology

Early intelligent robot navigation technologies were physical tracks and magnetic navigation, which depended on the installation of infrastructure and offered lower levels of automation.




- By incorporating location information into QR codes affixed to the ground and integrating them with intelligent robot's inertial navigation, traditional fully tracked guidance has been simplified to point-to-point navigation.

QR code navigation

Widespread adoption of QR code in warehouse field before 2015

- In 2000, QR code became an ISO international standard (ISO/IEC 18004), ensuring standardization across various industries.

Online payment Online ordering




- Laser SLAM technology utilizes laser sensors to scan the surrounding environment, constructing real-time maps while simultaneously determining the intelligent robot's location within that map.

Laser SLAM

Development of SLAM technology

- SLAM technology employs sensors to collect environmental data, allowing devices to estimate their location and navigate without pre-defined maps.

Autonomous driving Augmented reality



- Visual SLAM technology continuously captures camera images and extracts key features for matching, enabling intelligent robots to accurately calculate their position and orientation within the environment.

Visual SLAM

Combination of AI and computer vision

- Advancements in AI technologies, such as deep learning and LLM, significantly enhanced the accuracy of computer vision within complex environments.

Facial recognition Robots development

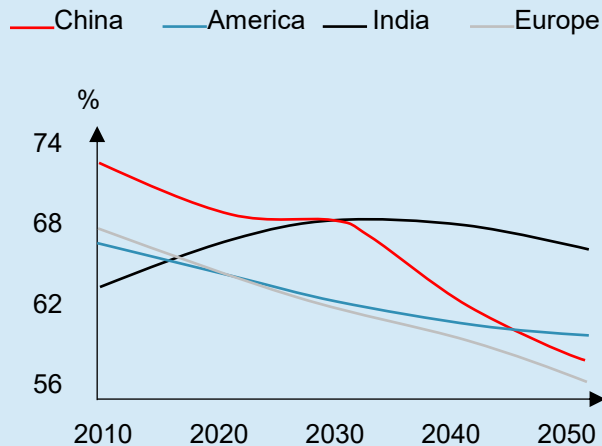
✓ *The advancement of intelligent robot navigation technology is driven by the development and application of foundational technologies, continuously enhancing the automation and intelligence of intelligent robots.*

From the demand side, growing labor shortages, ongoing supply chain efficiency trends, and rising industry budgets for intelligent transformation collectively drive robots' demands.

Labor Market Urgently Requires Intelligent Robots to Address Workforce Gaps

- With an aging population and declining birth rates, the labor market faces supply shortages.
- On the other hand, deepening urbanization has increased the demand for labor, further exacerbating the imbalance between labor supply and demand.

Proportion of Working-Age Population (15-64 years), 2010-2050E



Strong Alignment with Supply Chain Efficiency Needs Enterprises

Traditional Supply Chains

- **Industrial empowerment:** Enterprises require greater growth potential and reduced production costs to drive consumer willingness.
- **Product empowerment:** Product switching typically requires significant equipment adjustments and staff training time.

Robotics-empowered Supply Chain

- **Production efficiency:** Intelligent robots enhance enterprise productivity while enabling flexible adjustments to production schedules.
- **Product efficiency:** Intelligent robots achieve rapid product switching through quick configuration and management capabilities.

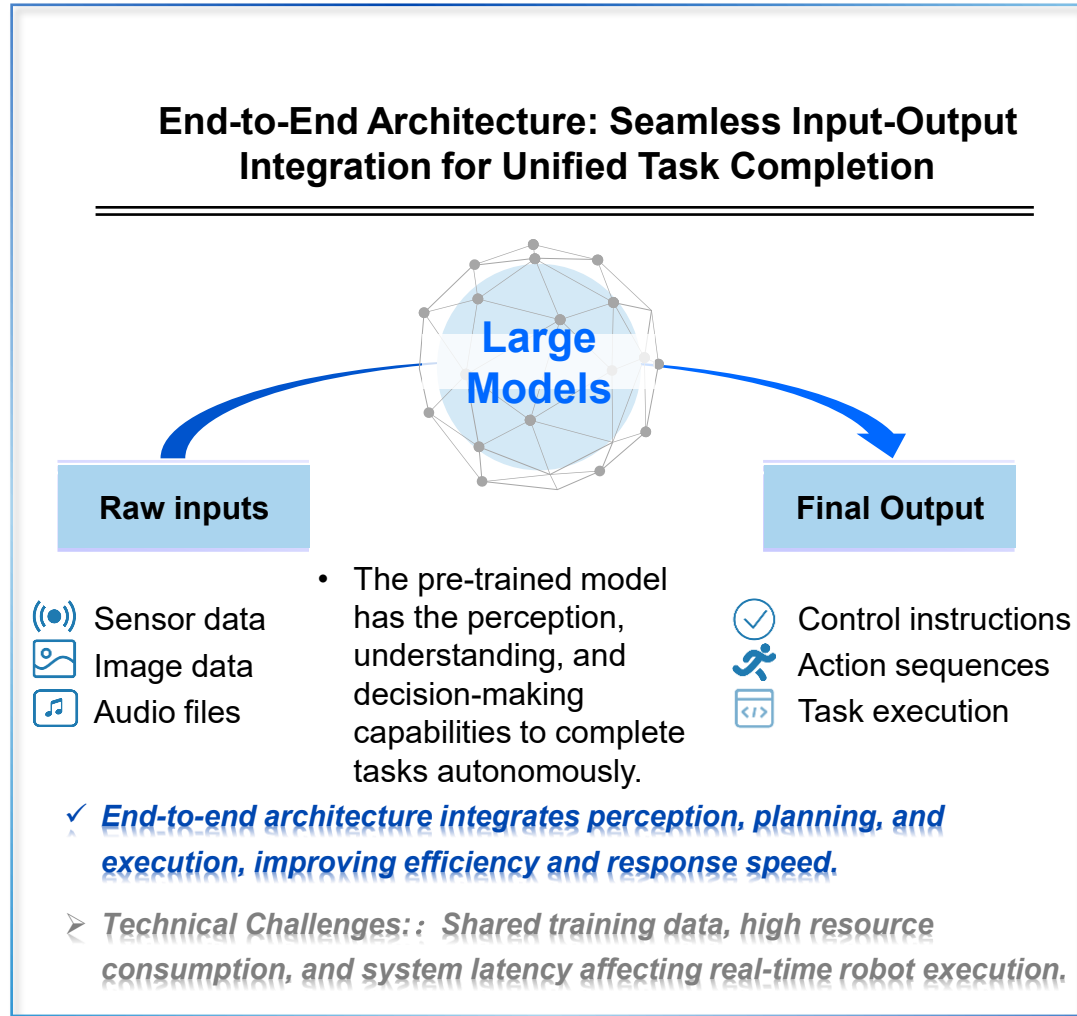
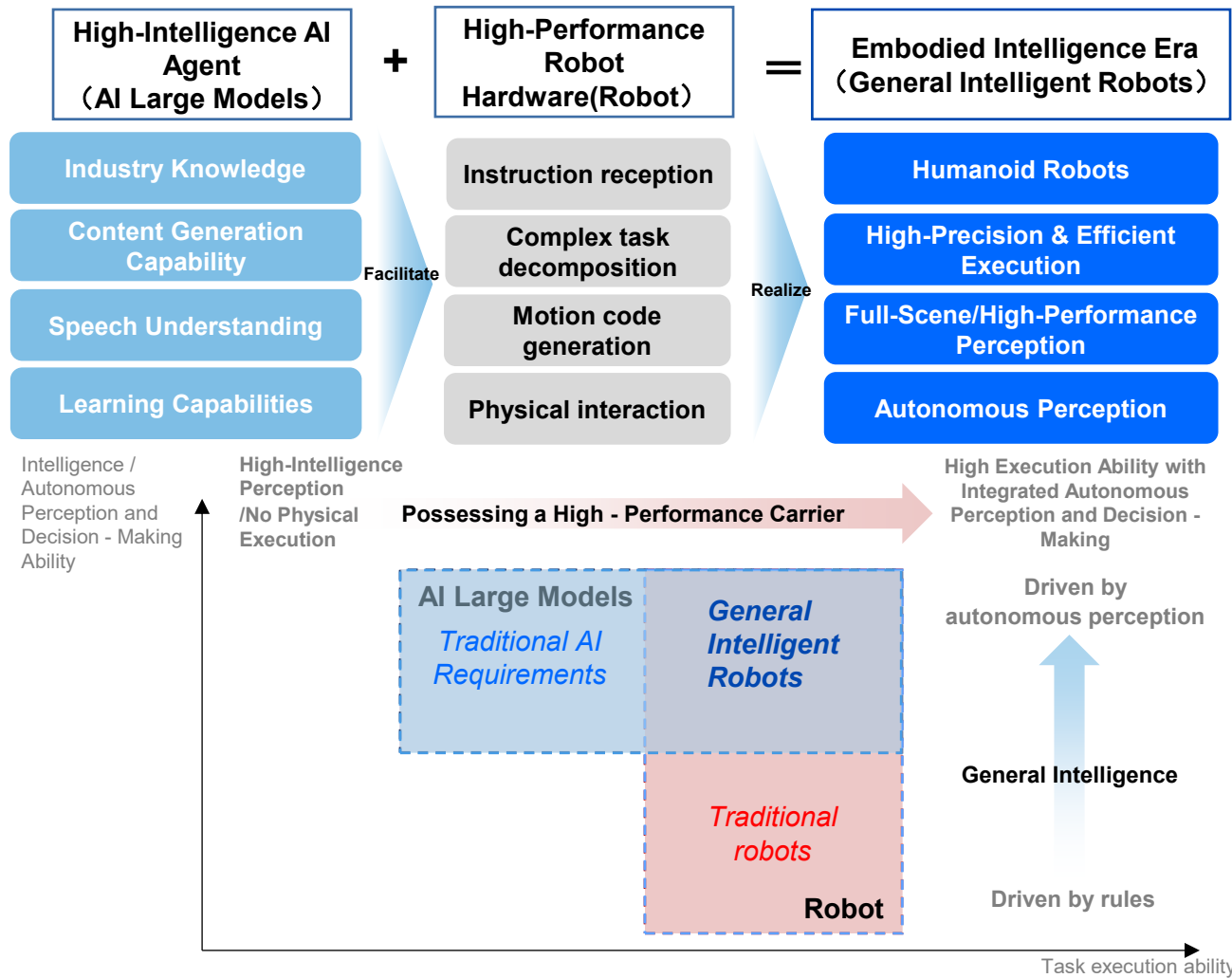
Rising Intelligent Transformation Budgets Across Industries

- AI technologies are increasingly being applied across various fields, driving intelligent industrial upgrades.
- In this era, intelligent robot development will provide enterprises with unprecedented competitive advantages, becoming a critical force in advancing industry progress.

Industry	AI Spending as % of IT Spending, %	
	2022	2027E
Finance	12%	20%
Retail	4%	6%
Manufacturing	2%	4%
Energy	5%	10%
Healthcare	6%	8%
Automotive	20%	26%
Government	22%	28%

Embodied intelligent brains allow robots to comprehend and generalize the physical world, leveraging end-to-end/hierarchical architectures for enhanced autonomous adaptability in real environments.

Robots as Critical Carriers for AI Large Model Deployment



Governments worldwide are actively supporting the intelligent robotic industry through targeted policies and resource allocation across R&D, manufacturing, and application. (1/3)

No.	Time	Region	Issuer	Name	Description	Impact level
1	2018	EU	European Commission	European Strategy for Artificial Intelligence	<ul style="list-style-type: none"> Efforts will be made in four areas: increasing investment, providing more data, cultivating talents, and ensuring trust, to promote the research and application of artificial intelligence in Europe. 	
2	2019	Korea	Ministry of Trade, Industry and Energy	The "Third Basic Plan for Intelligent Robots" (2019-2023)	<ul style="list-style-type: none"> Assign roles to the public and private sectors, focus on cultivating four service robot fields, including nursing, wearing, medical and logistics, and the government will lead and support special robots such as national defense, agriculture, underwater and evacuation; Strengthen the key components and software of next-generation robots. Expand the dissemination of manufacturing robots and provide a total of 700000 manufacturing robots by 2023, developing standard models for the use of robots in 108 processes. 	
3	2019	The U.S.	U.S. Department of Defense	Defense Robotics Program	<ul style="list-style-type: none"> Autonomous technology development themes can be categorized into Machine Perception, Reasoning and Intelligence, Human/Autonomous Systems Interaction and Collaboration (HASIC), Scalable Teams for Autonomous Systems (STA), and Test, Evaluation, Verification and Validation (TEVV). Seven core technologies were identified: sensors/payload, navigation/control, weapons, communications/data management, autonomy, propulsion/energy, and mobility. The largest investment is in integrated sensors and payloads, followed by navigation and control systems. The Department of Defense's 2019 annual budget for developing autonomous systems is US\$9.6 billion. 	
4	2019	The U.S.	National Science Foundation	National Robotics Initiative 2.0	<ul style="list-style-type: none"> The goal is to support basic research and advance the development and practical application of cobots in the United States. The budget is US\$35 million. 	
5	2020	The U.S.	NAC Science Committee	Mars Exploration Program	<ul style="list-style-type: none"> The space robot development project is funded by the National Aeronautics and Space Administration (NASA) of the United States. The MEP budget for 2017 was approximately US\$647 million, while the MEP budget for 2019 was approximately US\$644.5 million. 	
6	2021	Japan	National Institute of Science and Technology Policy	2021 Science and Technology Innovation White Paper	<ul style="list-style-type: none"> By 2050, through the co evolution of artificial intelligence and robots, robots will achieve autonomous learning, action, and symbiosis with humans. 	
7	2023	The U.S.	The White House	National Artificial Intelligence Research and Development Strategic Plan 2023	<ul style="list-style-type: none"> The latest updates for the 2016 and 2019 versions. Propose long-term investments in fundamental and responsible research on artificial intelligence, including enhancing the perception capabilities of artificial intelligence systems; Developing more powerful and reliable robots: Improving hardware to promote artificial intelligence: Creating AI systems with improved hardware, etc. 	

Governments worldwide are actively supporting the intelligent robotic industry through targeted policies and resource allocation across R&D, manufacturing, and application. (2/3)

No.	Time	Issuer	Name	Description	Impact level
1	Jan 2024	Ministry of Industry and Information Technology	Implementation Opinions of the Ministry of Industry and Information Technology and Seven Other Departments on Promoting Future Industrial Innovation and Development	<ul style="list-style-type: none"> Break through in core technologies such as high torque density servo motors, high dynamic motion planning and control, biomimetic perception and cognition for robots, with a focus on promoting the development and application of products in fields such as intelligent manufacturing, home services, and special environmental operations. 	
2	Aug 2023	Beijing Municipal Bureau of Economy and Information Technology	Several Measures for Promoting Innovative Development of the Robot Industry in Beijing	<ul style="list-style-type: none"> This city will establish a 10 billion yuan robot industry fund to support innovation team incubation, technology achievement transformation, enterprise mergers and acquisitions, and development and growth we will support enterprises to form consortia and solve the shortcomings and technical difficulties of the robotics industry, and provide support of up to 30 million yuan based on research and development investment. 	
3	Jan 2023	National Development and Reform Commission	Implementation Plan for "Robot+" Application Action	<ul style="list-style-type: none"> The policy was launched aiming at expand the use of robots in various fields such as manufacturing, agriculture, and healthcare, thereby fostering the digital transformation and high-quality development of the economy and society. It also supports market players to participate in core technology breakthroughs such as high torque density servo motors, high dynamic motion planning and control, and human-robot interaction technologies. 	
4	Dec 2021	Ministry of Industry and Information Technology, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Public Security, Ministry of Civil Affairs	14th Five Year Plan for the Development of the Robot Industry	<ul style="list-style-type: none"> The goals for 2025 include: <ol style="list-style-type: none"> 1) achieving breakthroughs in core robot technology and high-end products, achieving international advanced comprehensive indicators of the entire machine, and achieving the performance and reliability of key components at the international level of similar products; 2) The average annual growth rate of operating revenue in the robotics industry exceeds 20%; 3) Form a group of leading enterprises with international competitiveness and a large number of specialized, refined, and innovative "little giants" with strong innovation capabilities and good growth potential, and build 3 to 5 industrial clusters with international influence; 4) The density of manufacturing robots has doubled. 	

Governments worldwide are actively supporting the intelligent robotic industry through targeted policies and resource allocation across R&D, manufacturing, and application. (3/3)

No.	Time	Issuer	Name	Description	Impact level
5	Jul 2021	National Development and Reform Commission	The 14th Five Year Plan for the Development of Circular Economy	<ul style="list-style-type: none"> By combining industrial intelligence transformation and digital transformation, we will vigorously promote the remanufacturing of industrial equipment and expand the application scope of remanufacturing machine tools, industrial motors, and industrial robots. Support the widespread use of remanufactured products and services by enterprises in fields such as tunnel excavation, coal mining, and oil extraction. 	
6	Sep 2020	National Development and Reform Commission	Guiding Opinions on Expanding Investment in Strategic Emerging Industries, Cultivating and Strengthening New Growth Points	<ul style="list-style-type: none"> Accelerate the filling of gaps in the high-end equipment manufacturing industry. Key support will be given to the production of industrial robots, special robots for construction and medical purposes, high-end instruments and meters, rail transit equipment, high-end five axis CNC machine tools, energy-saving asynchronous traction motors, high-end medical equipment and pharmaceutical equipment, aerospace equipment, marine engineering equipment, and high-tech ships. Pilot demonstrations of intelligent manufacturing and intelligent construction will be implemented. 	
7	Jul 2020	National Standardization Administration, Central Cyberspace Administration, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology	Guidelines for the Construction of the National New Generation Artificial Intelligence Standard System	<ul style="list-style-type: none"> Strengthen the standardized top-level design in the field of artificial intelligence to promote technological research and development and standard formulation in the industry. Promote the technological research and development of the artificial intelligence industry to promote its healthy and sustainable development. Through standardization work, support the healthy and sustainable development of the artificial intelligence industry. 	

The intelligent robot industry is advancing through cost-efficient supply chains, the convergence of hardware and software, and role differentiation across the value chain.

1

Supply Chain Maturity and Cost Reduction



- Hardware development has advanced through accelerated localization of key components and scaled production, significantly reducing raw material costs. Enhanced supply chain efficiency in China has further shortened production cycles and improved overall manufacturing performance.
- Software progress, driven by rapid AI algorithm iteration and open-source ecosystem growth, has greatly improved development efficiency and system stability. These advances have reduced R&D costs and enhanced the market competitiveness of intelligent robots.

2

Generalization and Intelligent Development of Software and Hardware Technologies



- Hardware modularization and software standardization are driving intelligent robots toward generalization, enabling adaptation to diverse scenarios.
- The rapid development of AGI is propelling the industry forward, advancing robots from task-level automation to cognitive-level autonomous decision-making.
- The application of VLA end-to-end large models has made the perception–decision–control loop more efficient, significantly enhancing both the intelligence and application scope of robots.

3

Role Differentiation Across the Value Chain Drives Efficiency Gains and Professionalized Industry Division











- The rapid growth of the intelligent robot industry is driving role differentiation and specialization. Clear positioning of hardware manufacturers, software providers, and other stakeholders improves overall efficiency.
- Open platforms provide a technical foundation for industry division, enabling each party to focus on core strengths.
- By clarifying the roles of platform operators, suppliers, and users, platform companies can integrate resources, reduce redundant development, and drive the industry toward greater efficiency and professionalism.

Intelligent robots, with high precision, efficiency, and reliability, effectively bridge complex challenges in industrial fields and meet evolving manufacturing requirements.

Definition of industrial intelligent robot

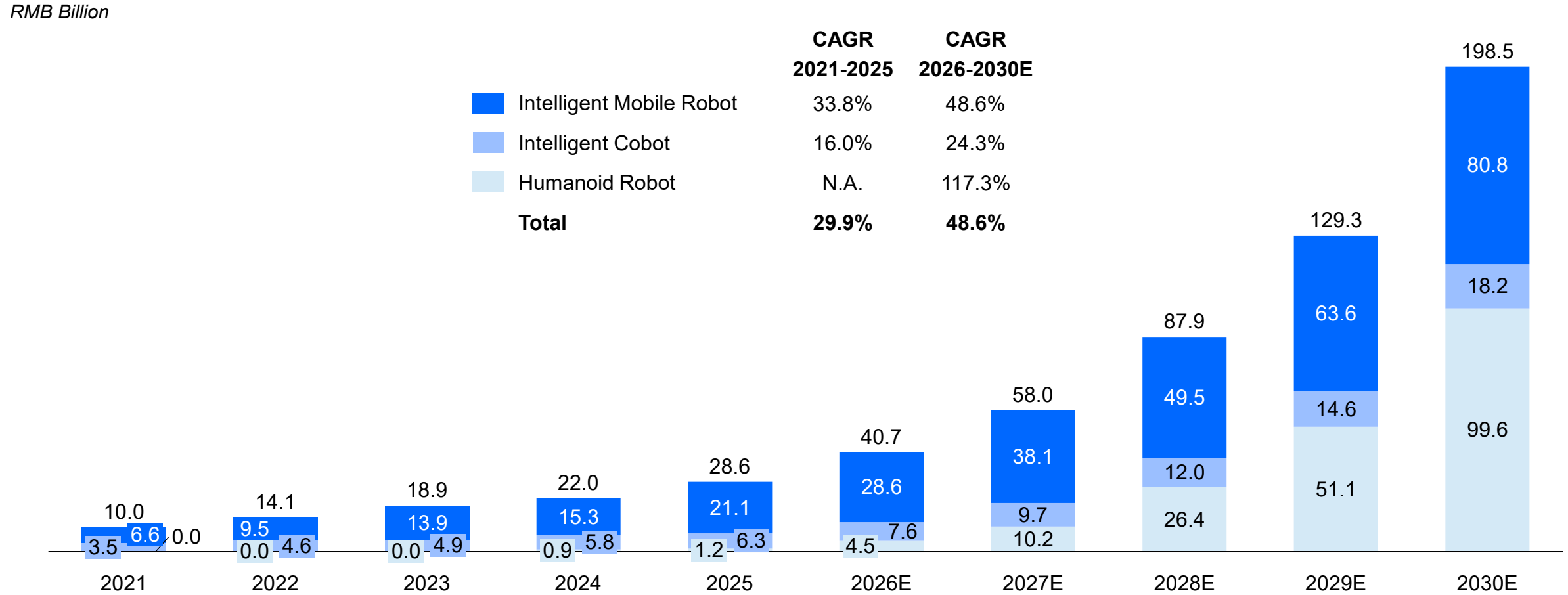
- Industrial Intelligent robots are applied in industrial scenarios. Industry is defined as the sector that transforms naturally occurring raw materials into other goods or tools through physical or chemical processes, encompassing multiple stages across the supply chain. Key industrial applications include 3C, automobile, lithium battery, photovoltaics and home appliance manufacturing.

Global downstream demands for industrial intelligent robot

	 3C	 Automobile	 Lithium battery	 Photovoltaics	 Home appliance manufacturing
Downstream industry challenges 	<ul style="list-style-type: none"> Diverse products, rapid iteration. Complex layouts. Frequent human errors. 	<ul style="list-style-type: none"> Numerous parts, complex supply chains. Long processes with uneven automation. Stringent quality and safety standards. 	<ul style="list-style-type: none"> Strict safety and consistency requirements. Chemical material and environment controls. Rapid capacity expansion with high barriers. 	<ul style="list-style-type: none"> High precision for cells and modules. Low automation, heavy manual labor. Strict cleanliness and consistency. 	<ul style="list-style-type: none"> Multiple product types with fluctuating demand. Balancing precision and flexibility. High labor costs and quality pressure.
Downstream industry requirements 	<ul style="list-style-type: none"> Precision assembly and operation. Flexible production lines. Material handling and logistics. Quality inspection and maintenance. 	<ul style="list-style-type: none"> Efficient assembly and testing. Flexible and mass customization. Automated in-plant logistics and coordination. Quality and safety traceability. 	<ul style="list-style-type: none"> High-precision, safe production. Automated loading / unloading and inspection. End-to-end data tracking and quality control. Flexible capacity expansion. 	<ul style="list-style-type: none"> High-precision, low-energy manufacturing. Intelligent inspection and traceability. Module handling and automated assembly. Cost reduction and clean production. 	<ul style="list-style-type: none"> Automated assembly and inspection. Flexible adaptation for various products. Smart warehousing and logistics. Quality assurance.
Application features of intelligent robot 	<ul style="list-style-type: none"> High accuracy with low error rates. Rapid reconfiguration for flexible production. Suitable for both large-scale and customized runs. 	<ul style="list-style-type: none"> Advanced automation and intelligent scheduling/fleet management. Strong reliability and safety. Improves overall vehicle quality and efficiency. 	<ul style="list-style-type: none"> Intelligent inspection and sorting. High reliability and safety. Facilitates rapid capacity expansion. 	<ul style="list-style-type: none"> Precise welding and lamination. 24/7 continuous operation. Fully digitalized and traceable processes. 	<ul style="list-style-type: none"> Multi-task coordination and automation. Enhanced product quality and efficiency. Reduced labor costs and error rates.

Global industrial intelligent robot market size maintains strong growth trend and intelligent mobile robots occupy the largest market share. (1/2)

Global industrial intelligent robot market size, in terms of sales revenue, by robot categories, 2021-2030E

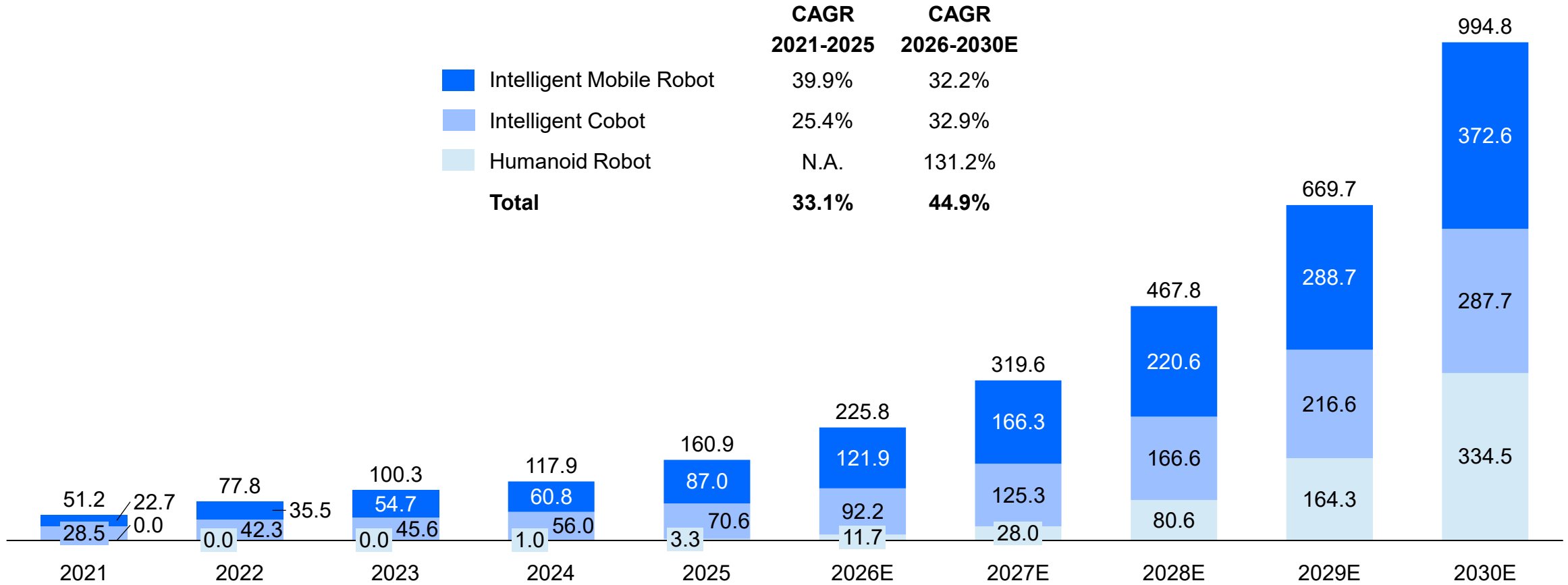


Note: Industrial Intelligent mobile robots include intelligent mobile robots that rely on SLAM navigation technology and are applied in the industrial fields. Industrial Intelligent cobots include intelligent cobots with six-axis or seven-axis six that are applied in the industrial fields. Others mainly include humanoid robots applied in the industrial fields.

Global industrial intelligent robot market size maintains strong growth trend and intelligent mobile robots occupy the largest market share. (2/2)

Global industrial intelligent robot market size, in terms of sales volume, by robot categories, 2021-2030E

Thousand Unit



Note: Industrial Intelligent mobile robots include intelligent mobile robots that rely on SLAM navigation technology and are applied in the industrial fields. Industrial Intelligent cobots include intelligent cobots with six-axis or seven-axis six that are applied in the industrial fields. Industrial humanoid robots include the ones applied in the industrial fields.

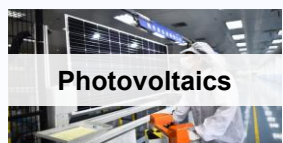
Industrial Intelligent robots face highly fragmented, complex non-standard applications, requiring customized solutions, while high technical barriers limit integrators' implementation capabilities.

Downstream applications are highly fragmented, with diverse needs



- Transporting raw materials, components, work-in-progress items, and PCB material racks.

- Final assembly, painting, welding workshops, handling of bodies and parts, etc.



- Transporting raw materials to coil storage early on; moving raw materials and finished products in later processes.

- Handling empty/full baskets in battery production lines; transporting raw materials and solder ribbons in workshops.



- Primarily handling and transporting small components .

~200,000
Number of global warehouses,
Distributed across multiple locations

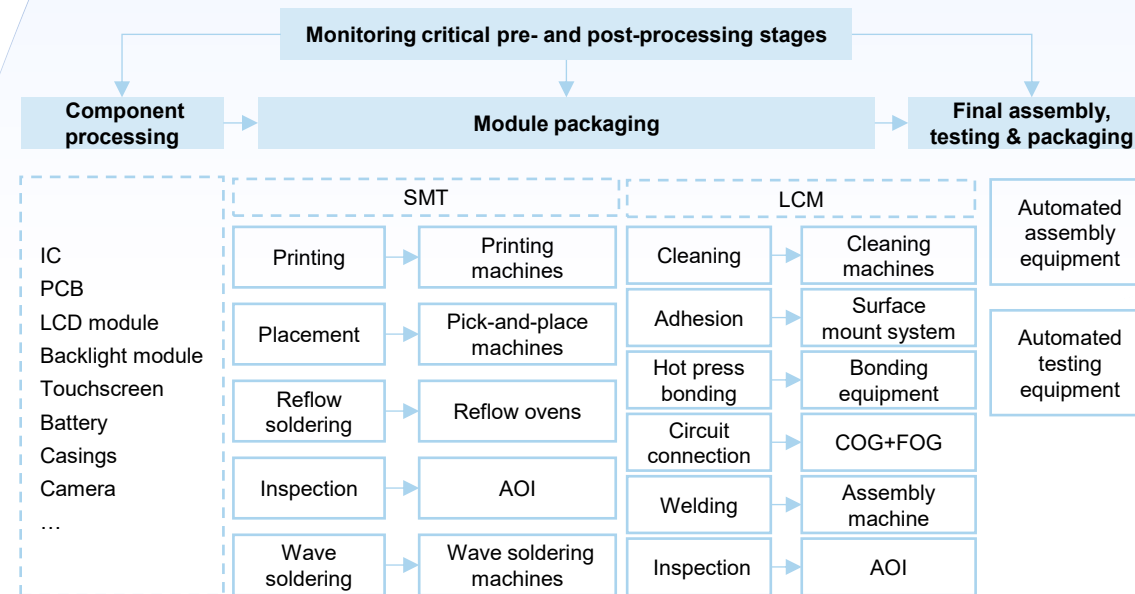
Complex process flows and component management, mostly non-standardized scenarios

Taking the 3C scenario as an example, the industry's pain points are evident:

¹Highly condensed deployment cycles

²Complex and rapidly evolving production processes

³Extensive variety of materials and components



Urgent need for system integrators to provide custom solutions covering “solution planning & design – installation & commissioning – deployment & operation”

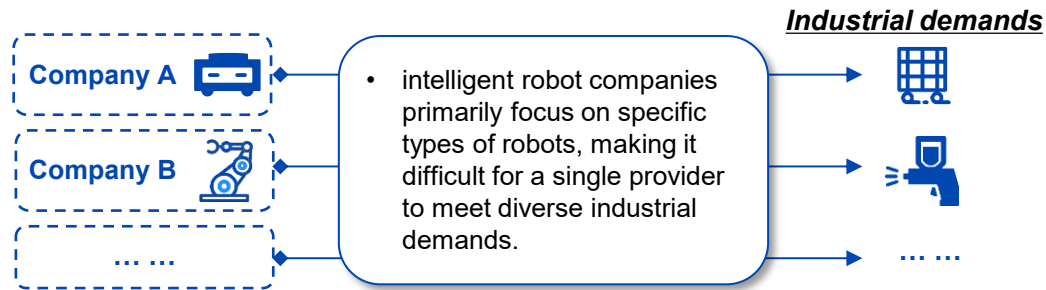
High technical barriers for non-standardized software & hardware, with system integrators lacking the capability to implement tailored solutions

The Intelligent robot industry faces limited product coverage within sole provider, fragmented demand, lack of standardization, and high tech barriers, making deployment challenging.

Pain points in the industrial intelligent robot industry

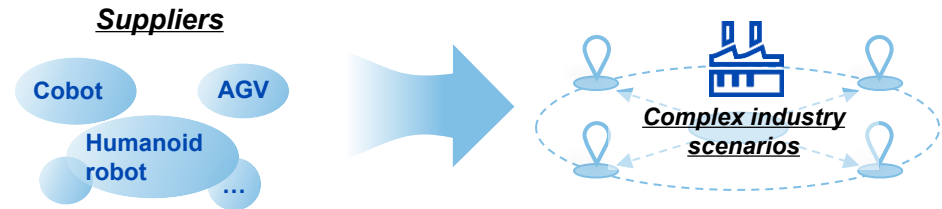
a Limited product coverage and high adoption barriers

- Most intelligent robot companies specialize in niche markets, resulting in a limited product range tailored to specific scenarios. This fragmentation complicates procurement for end-users, increases operational costs, and raises the barriers to robot adoption.



b Highly fragmented and complex industry scenarios

- Industry scenarios vary significantly, with highly diverse and fragmented demands across different Industries. Enterprises must source intelligent robots from multiple suppliers, increasing costs and complexity. Varying production processes and requirements across industries further elevate the difficulty of deploying suitable intelligent robots. Interoperability challenges among different robots also hinder overall production efficiency.



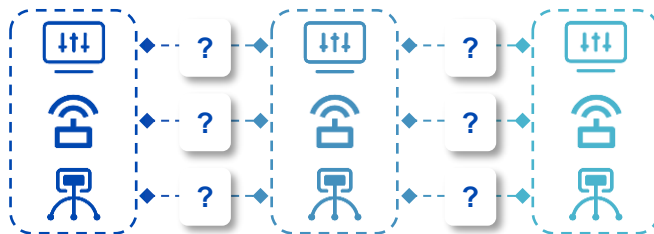
c Lack of standardization and poor interoperability

- The intelligent robot industry lacks unified standards for operating systems, communication protocols, and data interfaces across brands. This results in "information silos," preventing seamless coordination in task execution, path optimization, and priority scheduling. The absence of a universal orchestration platform limits operational efficiency, increases enterprise costs, and complicates system maintenance.

Operating system

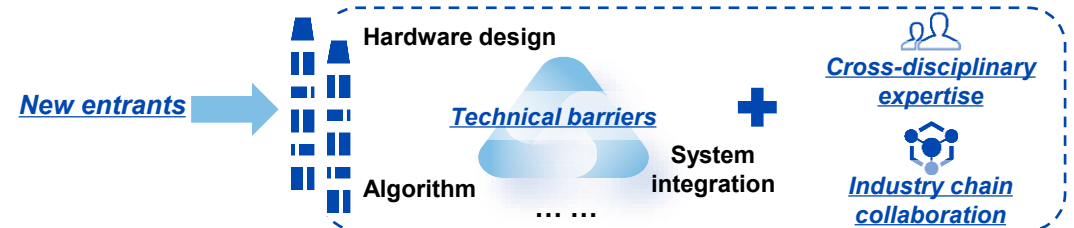
Communication protocol

Data interface



d High technical barriers and resource-intensive development

- The R&D and manufacturing of intelligent robot requires high level of technology and resource endowment. The high barriers make it difficult for new entrants to make a rapid breakthrough, while increasing the R&D investment and risk of enterprises. In addition, the manufacture of intelligent robot requires cross-disciplinary expertise and industry chain collaboration, which further raises the barriers to entry into the industry.



The intelligent robot open platform integrates resources across the entire industrial chain, facilitating efficient collaboration and enabling resource sharing throughout all stages of the industrial chain.

Comparison of Industrial Chain Resource Integration Models in the Intelligent Robot industry

Vertically Integrated Robot Companies

Through acquisitions or in-house development, these companies integrate the full value chain - from core components to system integration and end applications - forming a closed, self-contained ecosystem.



- Maintain independent control over core technologies and the supply chain
- Rely on in-house resources to establish a fully integrated presence across the entire value chain



- Technical capabilities and resources are not shared externally
- Ecosystem participants are limited
- Companies hold absolute control over product quality, technology roadmap, and the supply chain

HIKROBOT

Intelligent Robot Open Platforms

These platforms connect core component suppliers, manufacturers, integrators, and end users to provide comprehensive development and deployment solutions. By offering toolchains and technical services, they help lower development barriers and promote collaborative growth within the ecosystem.



- NOT directly engage in asset-heavy activities such as manufacturing, but instead achieves efficient integration through resource sharing and collaboration.



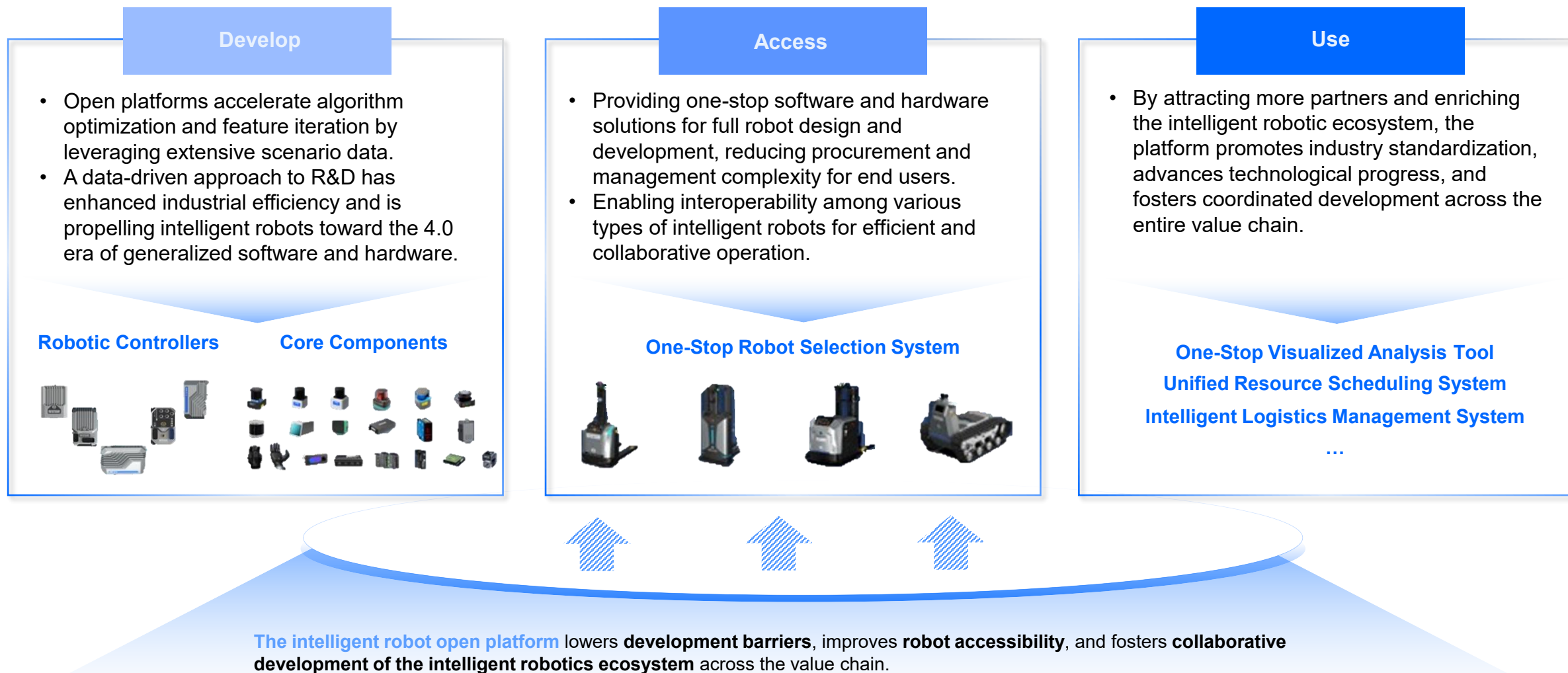
- Technical capabilities and resources are shared externally to attract more ecosystem participants, driving innovation and large-scale application.
- Build collaborative relationships with upstream and downstream companies and developers, rather than relying on procurement or acquisitions.

SEER

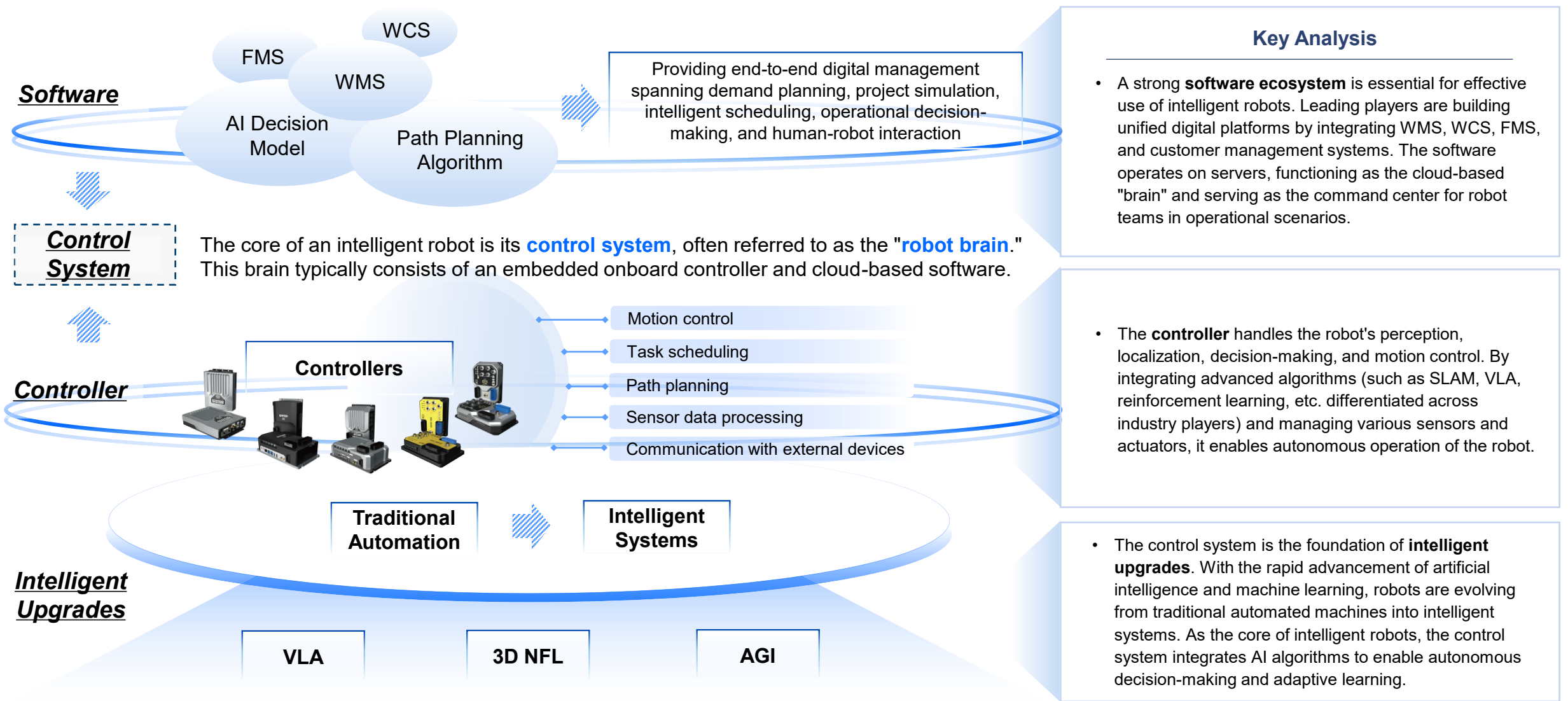
Lighter Heavier Weaker Stronger

Intelligent Robot Open Platforms share technical capabilities and resources, attract more developers, and offer standardized interfaces and tools to simplify development.

The intelligent robot open platform creates value by reducing development barriers and improving accessibility, while utilizing its technical capabilities to foster ecosystem expansion.



Top players have taken the lead in building intelligent robot open platforms by starting with control system.



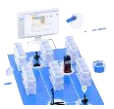
The control system, as the "brain" of the intelligent robot, comprises the controller and software, ensuring stable operation and precise movement.

Definition of control system

- The control system, often referred to as the **"brain" of the intelligent robot**, includes an embedded controller within the robot itself and cloud-based software that leverages intelligent scheduling and optimization algorithms to assign tasks, facilitating multi-robot coordination.

Components of control system

Software



- The software system interfaces upward with customer ERP, MES, and other management systems to receive operational commands, while downward it communicates with robots through the controller's unified interface to dispatch control/task instructions and monitor robot status.

→ This architecture enables unified management and efficient coordination of heterogeneous intelligent robots within operational environments.



Controller



Algorithm

- The controller algorithm is primarily responsible for path planning, including mature navigation and motion control algorithms.

Hardware

- The hardware of controller typically includes power management unit, data processing unit, storage, communication unit, and input/output unit. Some high-performance controllers also integrate additional functions such as INS, switch, audio, and USB.

Navigation algorithms



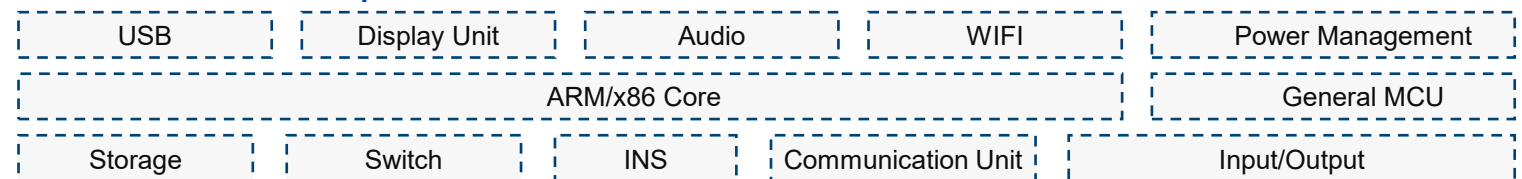
- Extracts environmental features and semantic information
- Automatically updates changing features during operation
- Ensures stable performance of the robot during runtime

Motion control algorithms

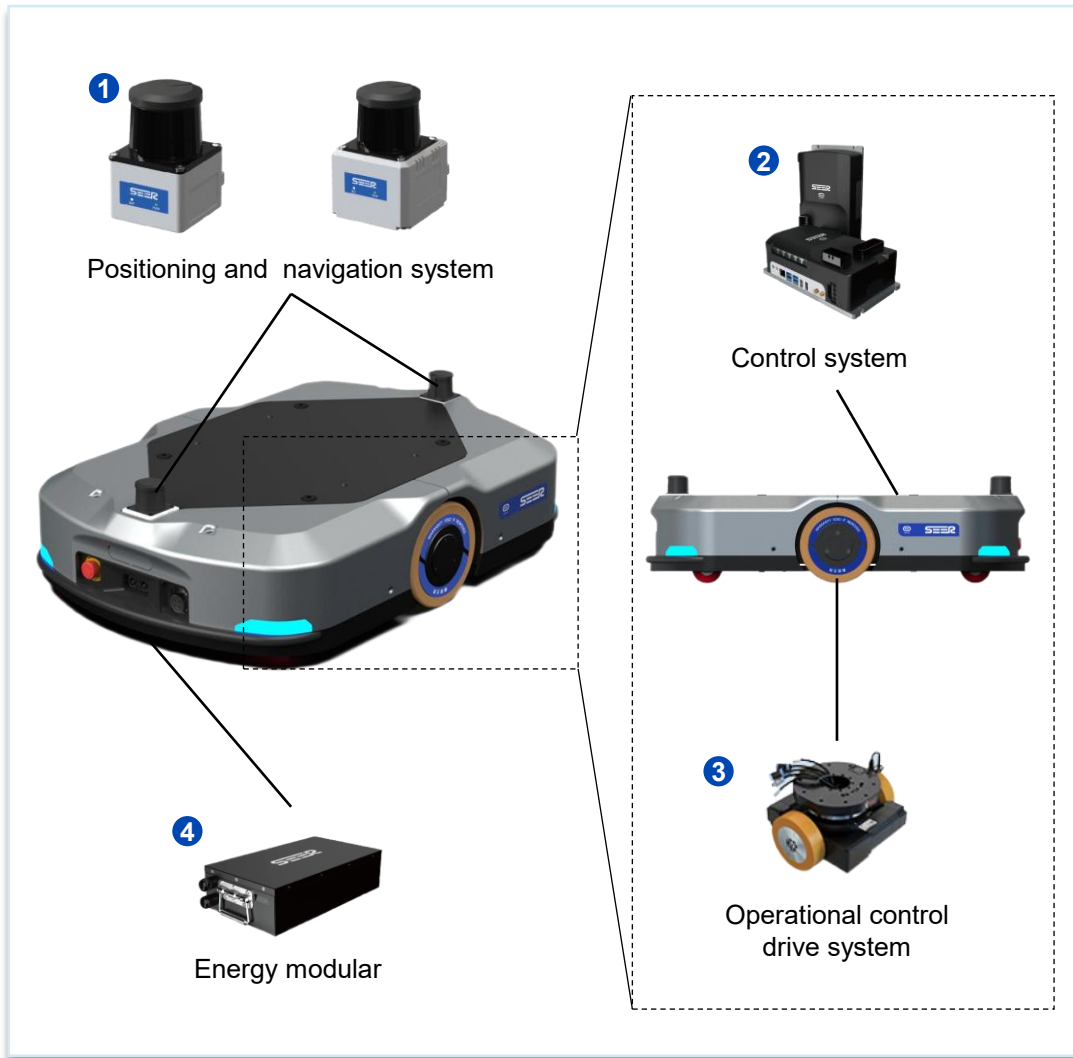


- Enables omnidirectional movement
- Calculates individual wheel speeds and directions
- Supports precise control in narrow or complex environments
- Integrates with sensor feedback and motion planning to execute accurate path following

Controller hardware components



Intelligent Robot Control System has a decisive impact on the overall performance of the robot.



1

Positioning and navigation system

- **Positioning and navigation system is the eye of the intelligent robot**, which is composed of LIDAR, vision sensor and SLAM technology, integrated with path planning and multi-sensor fusion algorithm, and bears the core functions of environment modeling, dynamic obstacle avoidance, accurate positioning and cluster collaboration.

2

Control system

- **Control system is the brain of intelligent robot**, the cost of which occupies **10~20%** of the whole machine across differentiated robot types, consists of controllers and software, integrates mature navigation and motion control algorithms, and undertakes key functions such as environment perception, intelligent decision-making, motion control and task execution.

3

Operational control drive system

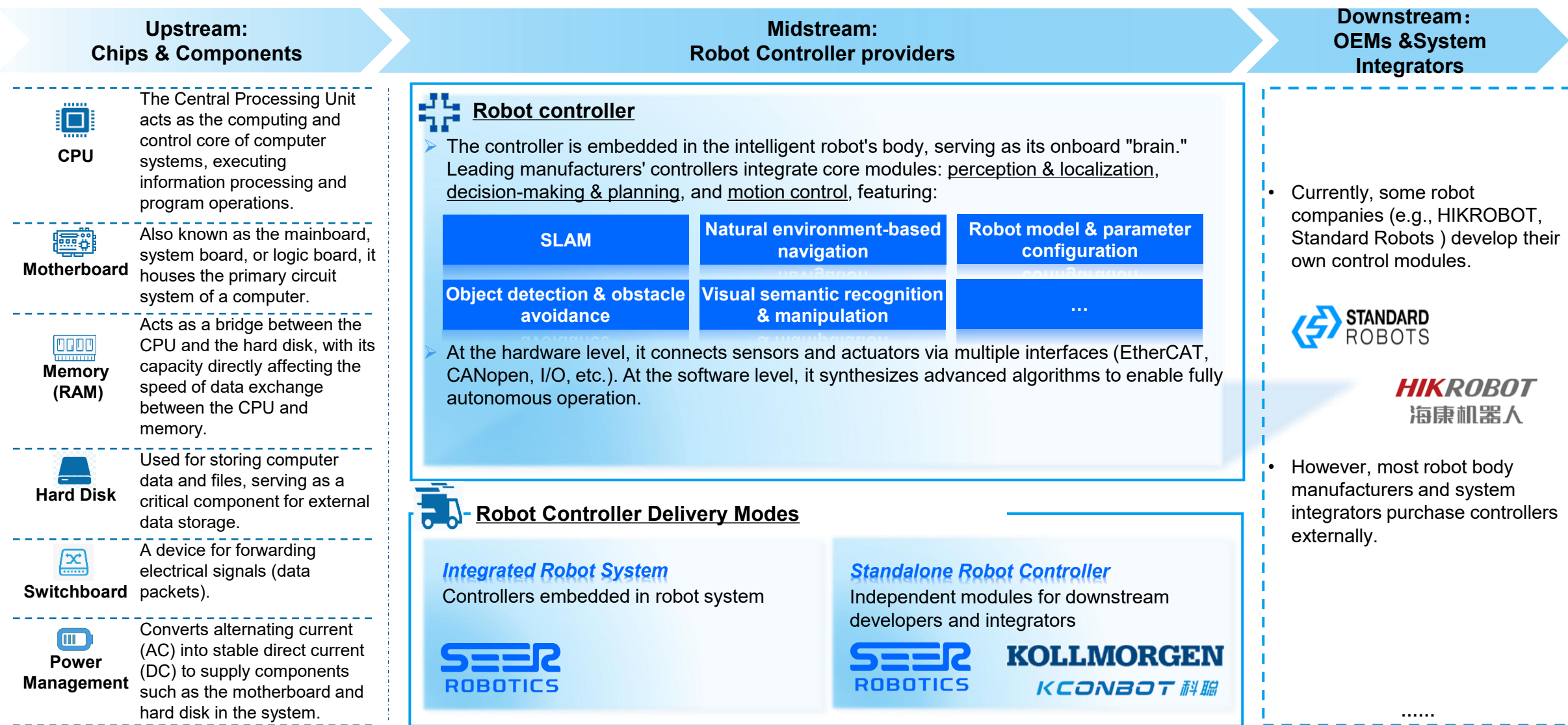
- **Operation control drive system is the muscular skeleton of intelligent robot**, which consists of servo motor, reducer and force control module, integrates motion control and dynamic response algorithm, and undertakes the core functions of power output, precision operation and safety protection.

4

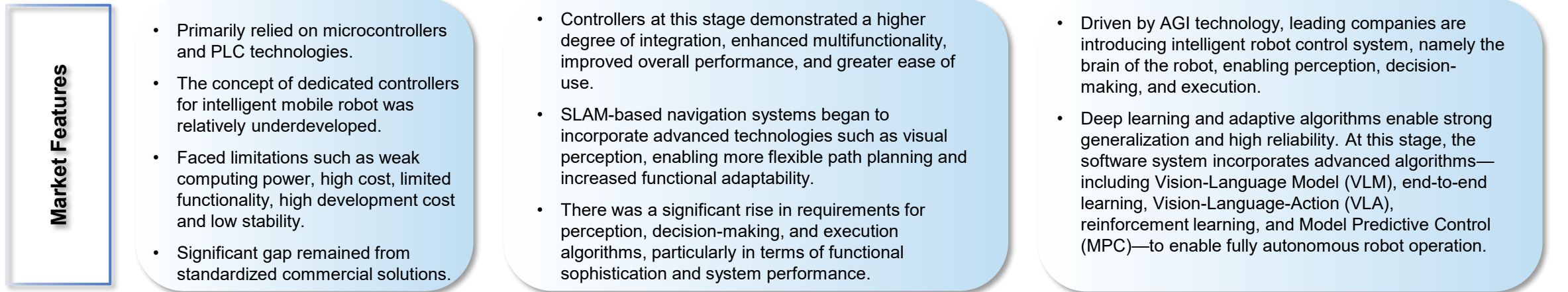
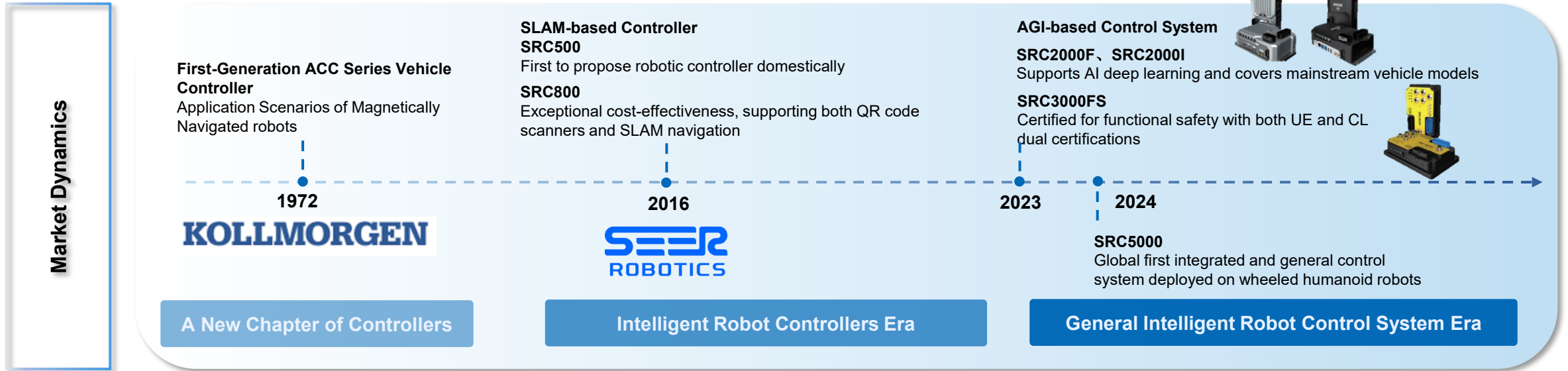
Energy modular

- **Energy modular is the power heart of intelligent robot**, which is composed of battery pack, energy management module and charging system, integrating intelligent charge/discharge control and multi-energy synergistic technology, and assuming the core functions of energy supply, efficient management and sustainable operation.

Robot controller providers integrate hardware and software capabilities and employ two controller delivery modes.



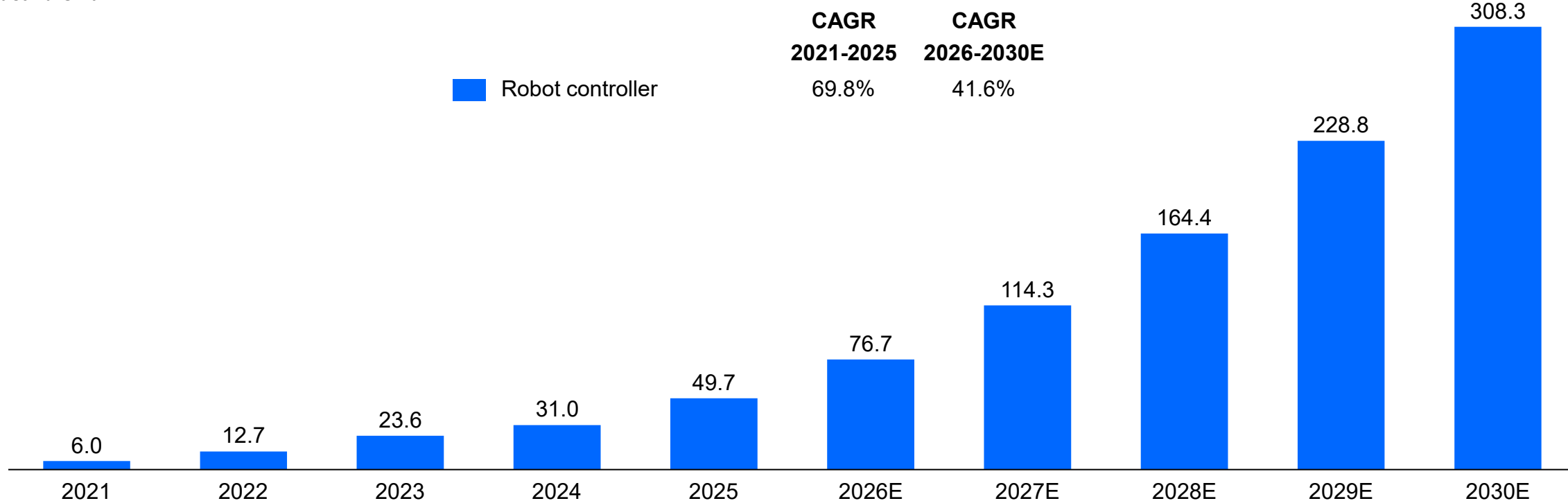
With the application of robots in more and more different industries and non-standard scenarios, the actual scenario puts more, higher and updated requirements on robot controllers in many aspects.



Advancing AGI and maturing robot supply chain are driving strong demand for professional robot controllers, boosting sustained growth in the globe to adopt robot controllers.

Global robot controller¹ market size, in terms of sales volume, 2021-2030E

Thousand Unit

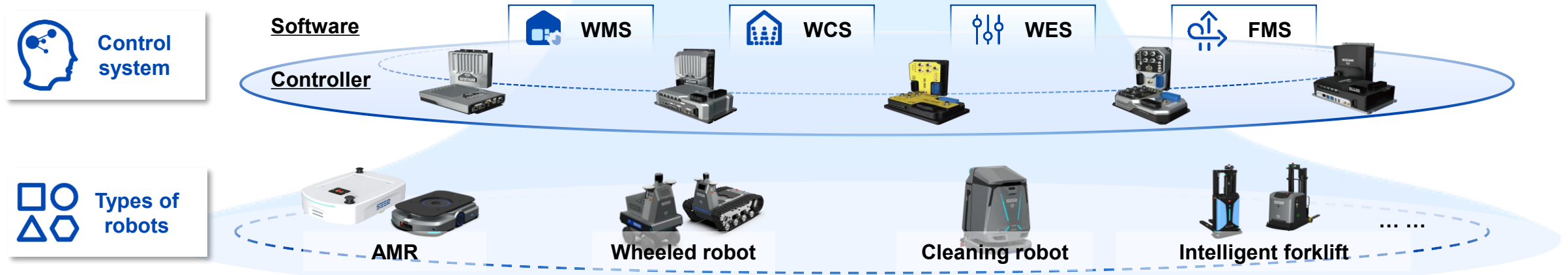
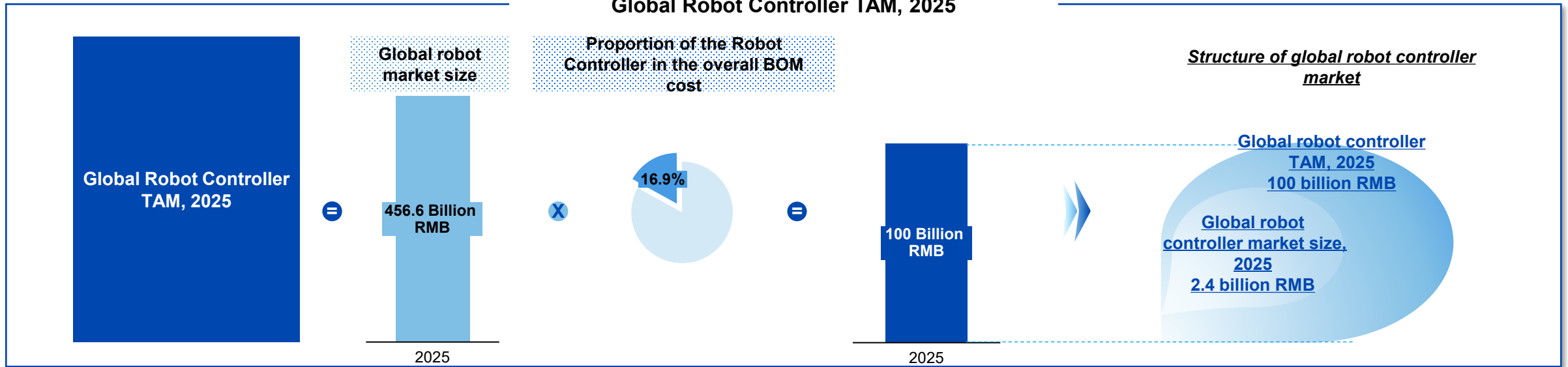


Penetration rate of global robot controller²:



Note: 1. The Robot controller market size calculation includes only commercially shipped units sold by third-party providers, excluding controllers for internal use by robot manufacturers. 2. The penetration rate of global robot controller is defined as the shipment volume of the global robot controller as a percentage of global robot controller shipments.

The global Robot Controller market holds tremendous potential, with TAM exceeding RMB 100 billion in 2025.



Note: Global robot market here does not include robots to consumer for personal or family use.

Drivers and trends of global robot controller industry

Drivers and trends of global robot controller industry

1

Recognition of Value Creation from Control Systems



- The value created by Robot Controller for intelligent robots is increasingly acknowledged, significantly lowering the technical application barriers and driving higher market penetration.

2

Breakthroughs by Chinese Manufacturers in Core Technologies



- Chinese manufacturers are capitalizing on global opportunities in intelligent robots, achieving breakthroughs in AI algorithms, motion control, and other core technologies. This progress accelerates the rapid development of robot controller and Intelligent Robot Control Systems, securing their leading position in the global market.

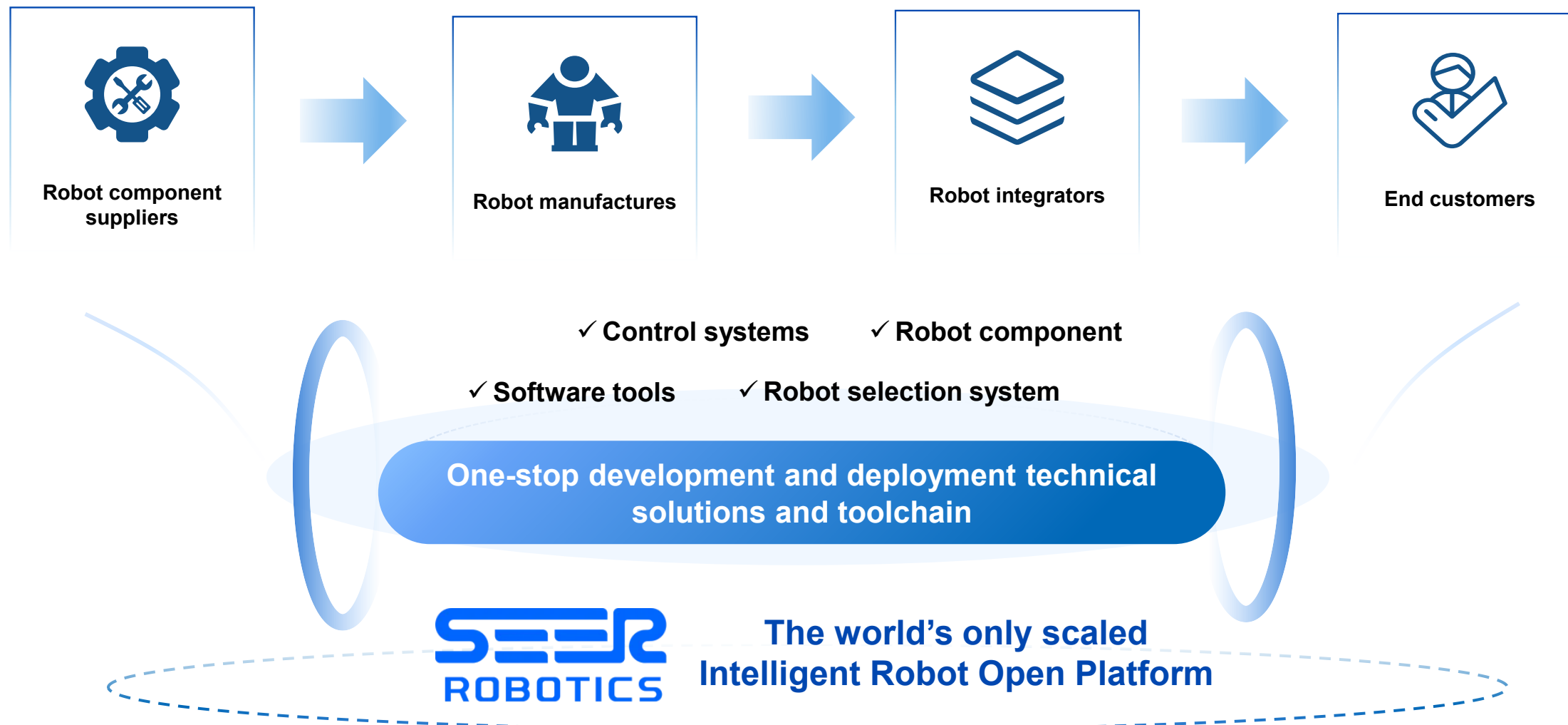
3

Advancements in Autonomous Capabilities via AI and Sensor Fusion



- Reinforcement learning and deep learning are optimizing control algorithms, while multi-modal sensor data fusion enhances system intelligence. As the "brain" of intelligent robots, control systems are further improving autonomous mobility and decision-making capabilities.

Seer Robotics has built the world's only scaled Intelligent Robot Open Platform, integrating global supply chain resources to provide a one-stop solution for robot development, access, and use.



In the global industrial intelligent robot market, the representative players are Hikrobot, Seer Robotics, Universal Robots, Junion, and FAIRINO.

Global leading industrial intelligent robot companies, 2025

Company	Founding Year	Headquarter	Business overview
Company B	2016	China	<ul style="list-style-type: none"> Company B is a global leader in machine vision and mobile robot products and solutions, primarily serving industrial transport applications. It is a subsidiary of a company(Hikvision) listed on the Shenzhen Stock Exchange.
The Company	2020	China	<ul style="list-style-type: none"> The Company is a global leader in intelligent robots, providing one-stop solutions for robot development, accessibility, and utilization.
Company A	2005	Denmark	<ul style="list-style-type: none"> Company A is a global leader in collaborative robots, used across a wide range of industries. It is a subsidiary of a company(Teradyne) listed on the New York Stock Exchange.
Company F	2019	China	<ul style="list-style-type: none"> Company F is a collaborative robot company that independently researches, develops and manufactures all core components, taking the lead in global supply chain innovation.
Company C	2017	China	<ul style="list-style-type: none"> Company C founded in 2017 and headquartered in China, a privately owned company, is a global leader in autonomous mobile robotic solutions, primarily serving photovoltaic sector.

In terms of the installed volume of robot controllers on industrial intelligent robots, Seer Robotics ranked the Second place of top 5 global leading industrial intelligent robot companies in 2025.

Top 5 global leading industrial intelligent robot companies, 2025

Company	The installed volume of robot controllers on industrial intelligent robots, Thousand, 2025	Market share, %, 2025	Industrial chain resource integration model
Company B	15.0	9.3%	Vertically integrated robot company
The Company	12.3	7.7%	Intelligent Robot Open Platform
Company A	8.7	5.4%	Robotic product company
Company F	8.5	5.3%	Robotic product company
Company C	7.4	4.6%	Robotic product company





















In the global robot controller market, the representative players are Seer Robotics, KC, Kollmorgen, BlueBotics and Balyo.

Global leading players in the global robot controller market, 2025

Company	Founding Year	Headquarter	Business overview
The Company	2020	China	<ul style="list-style-type: none"> The Company is a global leader in intelligent robots, providing one-stop solutions for robot development, accessibility, and utilization.
Company H	1916	United States	<ul style="list-style-type: none"> Company H is a global leader in motion control systems and components, providing robot controllers for mobile robots. It is a subsidiary of a company (Regal Rexnord) listed on the New York Stock Exchange.
Company I	2020	China	<ul style="list-style-type: none"> Company I is a global leader in robot controllers and integrated solution. KC is a privately owned company.
Company J	2001	Switzerland	<ul style="list-style-type: none"> Company J is a global leader in robot controllers, specializing in the development of natural feature navigation technology for mobile robots. It is a subsidiary of the privately owned company (Zapi Group).
Company K	2005	France	<ul style="list-style-type: none"> Company K is a global leader in intelligent robots, specializing in logistics and warehouse automation solutions. Balyo is listed on the Paris stock exchange.

In terms of the shipment volume of robot controllers, Seer Robotics has ranked first place globally for three consecutive years in 2023-2025.

Top 5 players in the global robot controller market, 2025

Company	The shipment volume ¹ of robot controller, Thousand, 2023	The shipment volume ¹ of robot controller, Thousand, 2024	The shipment volume ¹ of robot controller, Thousand, 2025	Market share, %, 2025
The Company	 4.1	 7.3	 12.3	 24.8
Company H	 ~3.6	 4.0	 9.2	 18.5
Company I	 <1.0	 3.4	 4.5	 9.1
Company J	 <1.0	 1.5	 1.5	 3
Company K	 <1.0	 1.5	 1.0	 2

Note: 1. The shipment volume of robot controllers includes two types of shipments: one is controllers embedded in robot system and the other is standalone robot controller.

Among the world's leading players in the global robot controller market, Seer Robotics's robot controllers hold a leading position from various aspects.

Top 5 players in the global robot controller market, 2025

Company	Controller comparison ¹					
	Positioning accuracy (mm)	Angle positioning accuracy (°)	Maximum speed (m/s)	SLAM map size (m ²)	CAN ² interface	RS 485 interface
The Company	±2~±10	±1	2	≤ 40,000	2	3
Company I	±5~±10	±0.5	N.A.	≤ 40,000	2	3
Company H	±2~±10	N.A.	N.A.	N.A.	3	1
Company J	±10	±1	3.5	N.A.	N.A.	N.A.

Note: 1. The controller comparison primarily involves Seer Robotics's SRC-2000 series and SRC-5000 series, Kecong's MRC-5000 series, Kollmorgen's CVC700, and Bluebotics' ANT lite+. 2. CAN(Controller Area Network) is a serial communication protocol used for communication between multiple devices.

Source: Company official websites, annual reports, CIC

Seer Robotics offers the most comprehensive intelligent robotic positioning and navigation technology solutions globally.

Top 5 players in the global robot controller market, 2025

Company	Positioning and navigation technology coverage					
	QR code navigation	Laser navigation			Visual navigation	Hybrid navigation ¹
		Laser reflector navigation	Natural feature navigation		Visual SLAM	
			SLAM	Feature location		
The Company	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Company I	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Company H	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Company J	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: 1. Hybrid navigation refers to the capability of combining two or more positioning and navigation technologies to provide intelligent robots with enhanced localization and navigation capabilities.

Source: Company official websites, annual reports, CIC

Key successful factors for global intelligent robot companies (1/2)

Key successful factors for global intelligent robot companies (1/2)

1

Efficient Integration of Hardware and Software Technologies & Standardized and Modular Development Capabilities



- Intelligent robots require the efficient integration of various technologies, including perception, decision-making, and control, while catering to diverse application scenarios. By leveraging standardized interfaces and modular design, development complexity is reduced, enhancing product scalability and compatibility.

2

Continuous Technological Innovation & Strong Technical Accumulation



- The intelligent robot industry evolves rapidly, with core technologies such as AI algorithm scheduling, SLAM, and motion control being key competitive factors. Sustained technological innovation and deep technical accumulation are essential for maintaining industry leadership.

Key successful factors for global intelligent robot companies (2/2)

Key successful factors for global intelligent robot companies (2/2)

3

Industry Chain Integration and Cost Control Capabilities with Extensive Ecosystem Resources and Brand Advantages



- Intelligent robot companies must establish close collaborations with core component suppliers, system integrators, and end customers to build a comprehensive industry ecosystem and strengthen brand advantages. By vertically integrating industry chain resources and leveraging large-scale production, companies can significantly reduce costs.

4

Extensive Industry Experience & Keen Market Insight

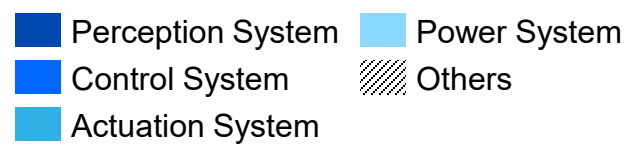
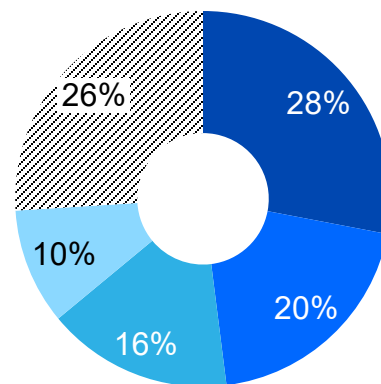


- Intelligent robot companies accumulate experience and technical capabilities in cross-scenario solutions, leveraging data analysis and user feedback to accurately grasp market demands. They establish an agile development system to quickly respond to market changes.

Verifications

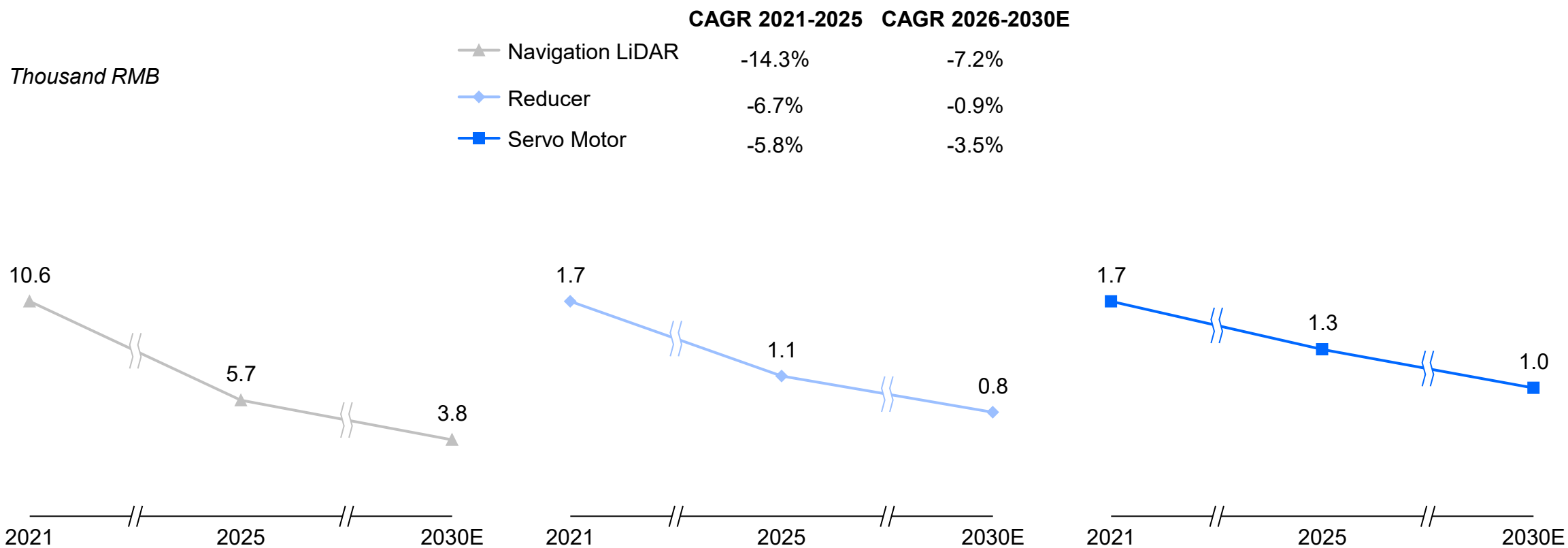
Cost Structure of AMR's Core Components, 2025

%

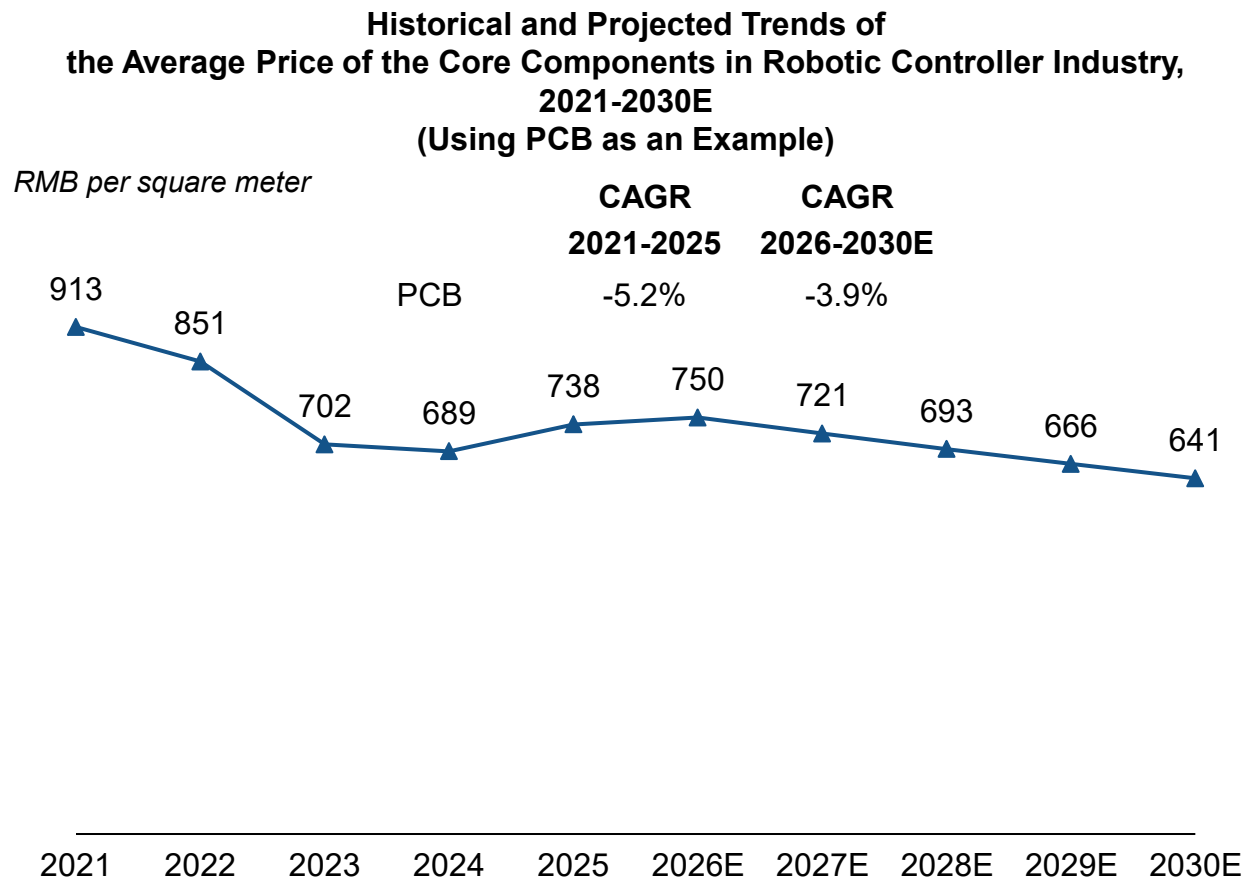


Note: Others include structural components, communication modules, and other parts.

Verifications



Verifications



Verifications

Rank	Company	Business Overview	Revenue from sales of industrial intelligent robots in 2025, Global (Hundred million RMB)	Market share, %
1	Company A	Founded in 2005 and headquartered in Denmark, a subsidiary of a company listed on the New York Stock Exchange, is a global leader in collaborative robots, used across a wide range of industries.	13.0	4.6%
2	Company B	Founded in 2016 and headquartered in China, a subsidiary of a company listed on the Shenzhen Stock Exchange, is a global leader in machine vision and mobile robot products and solutions, primarily serving industrial applications.	11.8	4.1%
3	Company C	Founded in 2017 and headquartered in China, a privately owned company, is a global leader in autonomous mobile robotic solutions, primarily serving photovoltaic sector.	4.0	1.4%
4	Company D	Founded in 2015 and headquartered in Taiwan, a subsidiary of a company listed on the Emerging Stock Market in Taiwan, is a global leader in cobots with embedded visual systems, software and application-based solutions to the market.	3.7	1.3%
5	Company E	Founded in 2015 and headquartered in China, a privately owned company, is a global leader in collaborative robots, used across a wide range of industries.	3.4	1.2%
			Subtotal	12.6%
7	The Company		3.0	1.1%

Verifications

Rank	Company	Business Overview	Revenue from sales of industrial intelligent robots in 2025, China (Hundred million RMB)	Market share, %
1	Company B	Founded in 2016 and headquartered in China, a subsidiary of a company listed on the Shenzhen Stock Exchange, is a global leader in machine vision and mobile robot products and solutions, primarily serving industrial applications.	7.8	8.0%
2	Company C	Founded in 2017 and headquartered in China, a privately owned company, is a global leader in autonomous mobile robotic solutions, primarily serving photovoltaic sector.	3.8	3.9%
3	The Company		2.5	2.5%
4	Company E	Founded in 2015 and headquartered in China, a privately owned company, is a global leader in collaborative robots, used across a wide range of industries.	2.4	2.4%
5	Company G	Founded in 2014 and headquartered in China, a privately owned company, is a global leader in collaborative robots, used across a wide range of industries.	2.2	2.3%

Verifications

Rank	Company	Business Overview	Number of industrial intelligent robots in 2025, China ⁽¹⁾ (units in thousands)	Market share ⁽²⁾ , %
1	Company B	Founded in 2016 and headquartered in China, a subsidiary of a company listed on the Shenzhen Stock Exchange, is a global leader in machine vision and mobile robot products and solutions, primarily serving industrial applications.	13.5	16.9%
2	The Company		11.6	14.6%
3	Company F	Founded in 2019 and headquartered in China, a privately owned company, is a global leader in collaborative robots, primarily serving industrial applications.	7.4	9.2%
4	Company C	Founded in 2017 and headquartered in China, a privately owned company, is a global leader in autonomous mobile robotic solutions, primarily serving photovoltaic sector.	7.2	9.0%
5	Company E	Founded in 2015 and headquartered in China, a privately owned company, is a global leader in collaborative robots, used across a wide range of industries.	4.8	6.0%

Verifications

- Our portfolio focuses on AMRs (including mobile manipulators) and humanoid robots for industrial deployment, which are distinct from commercial service robots and other robots deployed in non-industrial application scenarios, given their stringent precision requirements, expanded functional scope and challenging operating environments of industrial applications, according to CIC.
- According to CIC, the decrease in the gross profit margin of accessories during the Track Record Period was generally in line with the industry trend.
- According to CIC, the average price of sensors, a key component of our robots, declined at a CAGR of more than 10% in the past three years due to intensified market competition.
- According to CIC, the general decrease in the average unit price of our robotic controllers and robots during the Track Record Period is consistent with the industry trend.
- According to CIC, the general decrease in the average unit price of accessories during the Track Record Period is consistent with the industry trend.
- Among the industrial intelligent robotic enterprises, we ranked seventh globally and third in China in the industrial intelligent robot market by revenue in 2025, with market shares of 1.1% and 2.5%, respectively, according to CIC.
- In 2025, we ranked second globally and second in China in terms of the number of industrial intelligent robots equipped with the controllers supplied by the relevant robotics companies, with market shares of 7.7% and 14.6% respectively, according to CIC.
- We ranked first globally and in China by robotic controller sales volume in 2025 with market shares of 24.8% and 45.2%, respectively.
- According to CIC, it is not uncommon for players in the intelligent robot industry to outsource their manufacturing process.
- According to CIC, the size of the global intelligent robot market increased from RMB130.2 billion in 2021 to RMB307.4 billion in 2025, representing a CAGR of 24.0% from 2021 to 2025, and is projected to reach RMB850.0 billion by 2030, representing a CAGR of 24.6% from 2026 to 2030.
- According to CIC, there are more than 3,000 robotics enterprises in the industrial intelligent robot industry, whose market size amounted to RMB307.4 billion in 2025 in terms of revenue.
- We ranked first globally in terms of robotic controller sales volume for three consecutive years, according to CIC.
- According to CIC, in terms of gross merchandise volume from home service robots sales in the PRC, Ecovacs ranked first in the first half of 2020 and in 2024, and was a key participant in the downstream service robot industry of the Company as of June 30, 2020 and December 31, 2024, respectively, with the top three players collectively accounting for approximately 70.0% market share in 2024 and market size reaching approximately RMB19 billion.
- In terms of revenue from sales of industrial intelligent robots in 2025, the Company ranked seventh in 2025, according to CIC.
- In terms of the number of industrial intelligent robots equipped with their controllers in 2025, the Company ranked second globally among the industrial intelligent robotic enterprises, according to CIC.
- In the robotic controller industry, the Company ranked first globally in terms of robotic controller sales volume in 2025, according to CIC.

Verifications

- according to CIC. The number of industrial intelligent robots equipped with controllers supplied by these five enterprises accounted for approximately 32.3% of all industrial intelligent robots in 2025.
- According to CIC, in China, the Company ranked third in terms of revenue from sales of industrial intelligent robots in 2025, and second in terms of the number of industrial intelligent robots equipped with controllers supplied by the respective enterprises in 2025.
- In terms of sales volume of controllers for industrial intelligent robots in 2025, the Company ranked the first both globally and in China, according to CIC.
- Our industrial-grade robotic controllers are technically validated through a series of key international safety and performance standards, including CE-EMC, CE-LVD, CE-MD and UL, which, according to CIC, indicate that our controllers deliver superior usability and operating stability in demanding industrial applications.
- According to CIC, our robotic control system is the first in the industry globally to achieve functional safety certifications, including ISO 13849, IEC 61508 and IEC 62061, which validate its application in safety-critical industrial scenarios.
- According to CIC, we ranked first globally in terms of robotic controller sales volume in 2025, with a market share of 24.8%.
- According to CIC, we are the first in the intelligent robot industry to independently build a full-process development toolchain for intelligent robots, which, together with our Nebula system and data repository, forms the foundation of our open platform.
- Our knowledge base, built from large-scale data collected in varied industrial scenarios, is the first open-access, structured knowledge framework in the intelligent robot industry, according to CIC.
- According to CIC, we introduced the SRC-5000, the first controller integrating embodied AI in the world, which addresses long-standing challenges in synchronizing hand-eye-foot movements and introduces a complete perception, decision-making and execution architecture.
- Adopted by global leaders in sectors including 3C, automotive, automation equipment and new energy, our solutions have reduced material handling labor demand by up to 50% compared to pre-deployment levels, which indicates a productivity gain ranked among the highest in the industry, according to CIC.
- Powered by machine learning-driven optimization, our operations system supports one of the broadest sets of deployment scenarios in the intelligent robot industry, according to CIC.
- In addition, our low-code engine delivers industrial-grade usability through a modern technical stack and interface framework, which enables workflow customization and interface development at more than twice the speed of traditional models, according to CIC.
- Our revenue increased from RMB249.0 million in 2023 to RMB441.9 million in 2025, at a CAGR of 33.2% from 2023 to 2025. Over the same period, our gross profit margin remained above 45.0%, which positioned us among the top players in the intelligent robot industry, according to CIC.
- We have obtained a series of key international certifications, including CE-EMC, CE-LVD, CE-MD and UL, which reinforce product credibility and enable faster global rollouts, positioning us as a leader in the global adoption of China-made intelligent robots, according to CIC.
- According to CIC, it is not uncommon that enterprises in the intelligent robot industry engage in third-party payment arrangements.

Verifications

- According to CIC, the intelligent robot industry comprises multiple specialized segments, including component design and manufacturing, robot design and development, manufacturing, assembly and integration, and algorithm and software development.
- According to CIC, our insurance coverage is in line with the market practice.
- According to CIC, in terms of revenue, the size of the global intelligent robot market increased from RMB130.2 billion in 2021 to RMB307.4 billion in 2025, representing a CAGR of 24.0% from 2021 to 2025, and is projected to reach RMB850.0 billion by 2030, representing a CAGR of 24.6% from 2026 to 2030. The penetration rate of intelligent robots in terms of sales volume has also grown steadily from 43% in 2021 to 64% in 2025, and is expected to reach 81% by 2030.
- According to CIC, functional safety has become not only a compliance requirement, but also a necessary condition for enterprises to participate in global market competition.
- According to CIC, in terms of sales revenue, the size of the global intelligent forklift robot market increased from RMB15.4 billion in 2025 to RMB49.9 billion by 2030, representing a CAGR of 25.6% from 2026 to 2030.
- According to CIC, Japan is the largest single developed market in the Asia-Pacific region with well-established industrial sector and high acceptance of robots.
- According to CIC, China's industrial robot exports exceeded RMB12.0 billion in 2025, representing a year-on-year increase of 48.7%, underscoring the continued expansion of its global market presence.
- In 2023, 2024 and 2025 consecutively, we ranked first in terms of robotic controller sales volume, according to CIC.
- Therefore, a substantial portion of our sales of robots is recognized as our revenue in the second half of each year. According to CIC, such seasonality is common across the industrial robotics industry and is primarily attributable to the procurement and budget cycles of downstream industrial customers and integration lead times commonly observed in industrial automation procurement behavior.
- According to CIC, the level of turnover days of our inventories during the Track Record Period was in line with the industry norm.
- We believe the risk of significant impairment on inventories is low because, according to CIC, the key technology iteration cycle in the intelligent robot industry is relatively long.
- According to CIC, the robotic industry is rapidly expanding and participants in this industry therefore invest more in customer acquisition than receivable collection efforts, leading to an increasing trend of trade receivables turnover days in this industry.
- According to CIC, the above-mentioned situations are frequently observed reasons for delays in the settlement of trade receivables in China's robot industry.
- According to CIC, fewer than 10,000 target component manufacturers which primarily focus on key robotics components, such as sensors, actuators and control systems, and fewer than 5,000 target robot body manufacturers and integrators focusing on the 3C, automotive, or semiconductor industries with sustainable business operations are available in the market, based on the information extracted from company incorporation databases and relevant business descriptions.
- According to CIC, China's industrial robot exports exceeded RMB12.0 billion in 2025, representing a year-on-year increase of 48.7%, reflecting the continued expansion of Chinese industrial intelligent robot companies in overseas markets.

Verifications

- According to CIC, the United States remains a key industrial automation market, with approximately 400 thousand industrial robots operating in factories.
- According to CIC, Germany is a leading robotics market in Europe, with approximately 300 thousand industrial robots currently operating.
- According to CIC, Japan has nearly 450 thousand industrial robots operating in its factories and remains one of the world's most robotized countries.
- According to CIC, Thailand has the largest number of operating industrial robots in Southeast Asia, while less than 20% of its nearly 150 thousand factories are using industrial robots, indicating substantial untapped automation potential.



China Insights Consultancy Industry Report on Global Robot Industry

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