2024 MANUFACTURING ROBOTICS

UNITED STATES AND GLOBAL PERSPECTIVE

Industry Report | June 2024

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ACCELERATED MFG. BROKERS
THE MANUFACTURING M&A EXPERTS

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1. EXECUTIVE SUMMARY

The global industrial robotics market revenue is projected to grow at a CAGR of 3.23% from 2023 to 2028, reaching US$10.41 billion by 2028. Meanwhile, the US industrial robotics market, valued at USD 630 million in 2023, is forecasted to expand at a compound annual growth rate (CAGR) of 2.71% from 2023 to 2028.

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The surge in market value is attributed to the rapid adoption of advanced robotics across various sectors, including automotive, electronics, and metal & machinery. This growth trajectory underscores the increasing reliance on robotic solutions to meet the evolving demands of modern manufacturing. This report delves into the current market landscape, highlighting key trends, strengths, opportunities, and future projections, providing a comprehensive overview of the industry's dynamics.

The manufacturing robotics market in the USA is driven by several key trends, including the integration of artificial intelligence and machine learning for improved accuracy and adaptability, advancements in human-robot interaction through better sensors and user-friendly interfaces, and the rise of humanoid robots symbolizing technological prowess. The demand for customization and flexibility in manufacturing is growing, with robotics systems designed for easy reprogramming and diverse tasks. Sustainability and energy efficiency are prioritized, with robots aiding in green manufacturing practices. Mobile manipulators are expanding collaborative robot applications, while cybersecurity measures are being strengthened to protect connected systems. Virtual and augmented reality technologies enhance training and

remote assistance, reducing downtime and increasing productivity. The market is also seeing growth in emerging markets, driven by industrialization and rising demand, with virtual simulation and digital twin technologies optimizing performance and cost efficiency.

The US market exhibits significant strengths, including leadership in AI research, a robust industrial base, and supportive government initiatives. However, it faces challenges like high capital expenditure and integration complexities. Opportunities abound with the adoption of Industry 4.0 technologies, sustainable manufacturing, and rising demand for collaborative robots, particularly amid labor shortages and re-shoring trends. Threats include cybersecurity risks, regulatory challenges, economic vulnerabilities, and intense market competition. Despite these challenges, the sector is poised for substantial growth and innovation.

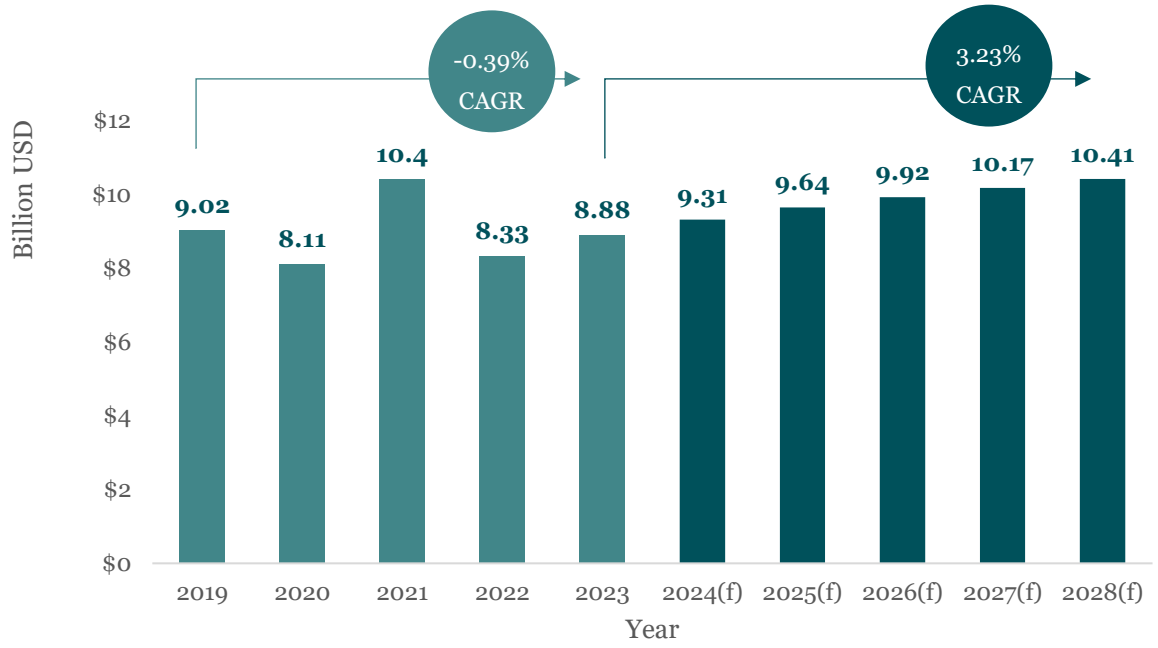
Recent mergers and acquisitions (M&A) in the manufacturing robotics industry include significant transactions that underscore the sector's dynamic growth. Applied Intuition's acquisition of Embark Trucks for $73.5 million, SoftBank's acquisition of a 41.8% stake in Balyo for $13 million, DuPont's acquisition of Spectrum Plastics Group for $1.75 billion, and, Ocado Group's acquisition of 6 River Systems from Shopify for $12.7. These transactions reflect ongoing strategic consolidation and innovation within the manufacturing robotics industry.

2. MARKET OVERVIEW

2.1 Global Industrial Robotics Market

Despite the frightening, almost Terminator-esque, way the phrase "there are robots everywhere" might sound, the increased use of robotics has been a boon to both consumers and enterprises worldwide. The industrial robot market has seen steady growth across the globe and is expected to continue growing as automation becomes ever more vital to businesses. This stems largely from mechanical automation, reducing production costs and improving efficiency. This increased demand due to greater automation, especially in the United States and Europe is likely to mean that the price increase per robot unit will remain modest.

Figure 1: Global Industrial Robotics Market Size



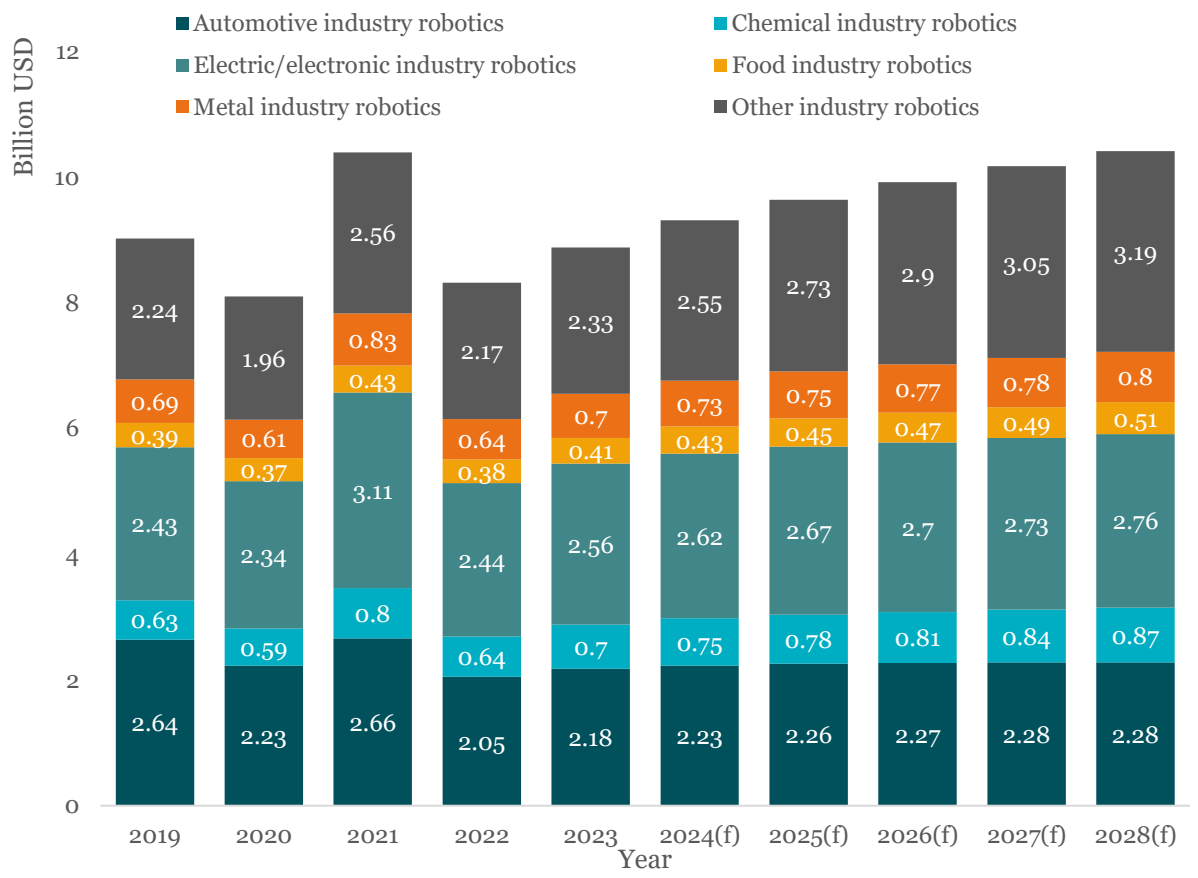
Source: *Statista Market Insights*[1]

In terms of the current revenue distribution within the Industrial Robotics segment, the two largest subsegments, Automotive Industry Robotics and Electric/Electronic Industry Robotics, account for more than 50% of the segment. However, Other Industry Robotics is expected to become the second-largest subsegment by 2026 and the largest by 2027. This demonstrates the enormous potential for new use cases of automation in industries that are not yet using robots.

The most commonly deployed types of robots in manufacturing include gantry robots, systems that move along a single axis, and SCARA robots, machines that are capable of moving along three axes. Among the newest robots, both autonomous mobile robots and collaborative robots are designed to work close to humans. While autonomous mobile robots often require demarcated avenues of mobility, collaborative robots

share a workspace with human workers and help them with tasks that are better suited for robots, such as assembly or quality inspection.

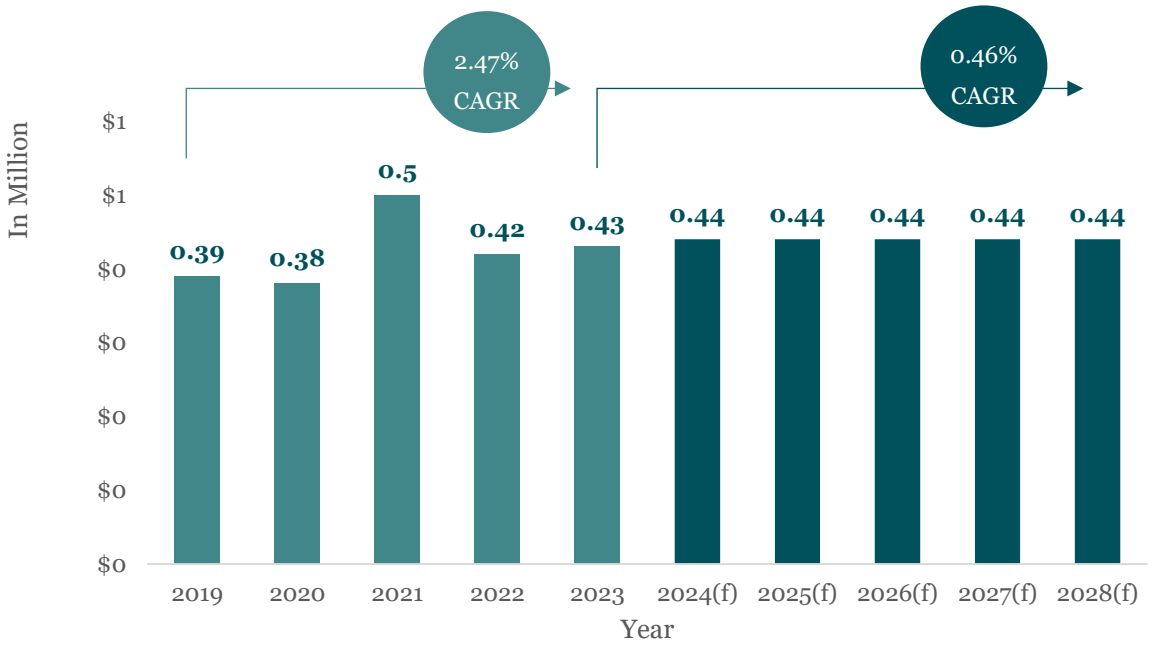
Figure 2: Global Industrial Robotics Market Size by Segment



Source: *Statista Market Insights*

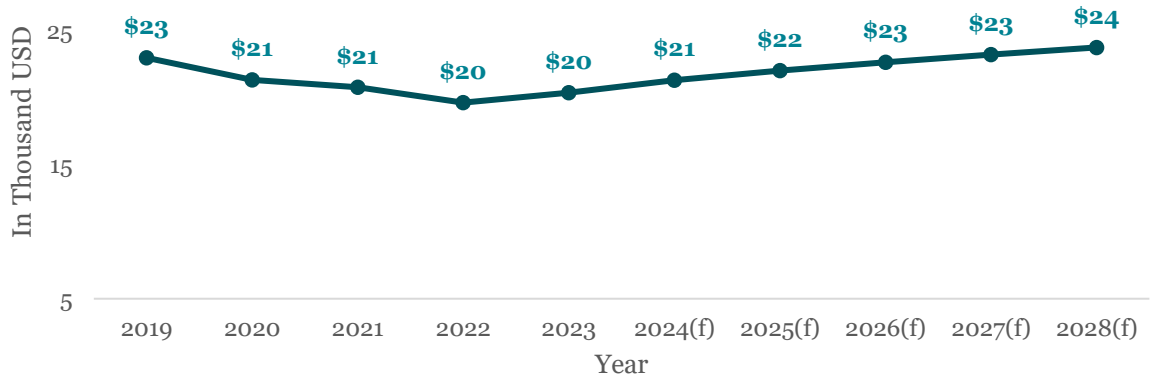
For the most part, with the significant developments in the field, robots appear to be here to stay. At nearly all levels of society, enterprises are investigating how they might utilize this technology to improve their business. Industrial sectors are looking to robots to replace workers, while in healthcare, specialist care robots are being explored for the same reason. In general, filling positions of specialist skills, accounting for labor shortages, and improving efficiency will demand robotic solutions for various problems.

Figure 3: Global Industrial Robotics Volume



Source: *Statista Market Insights*

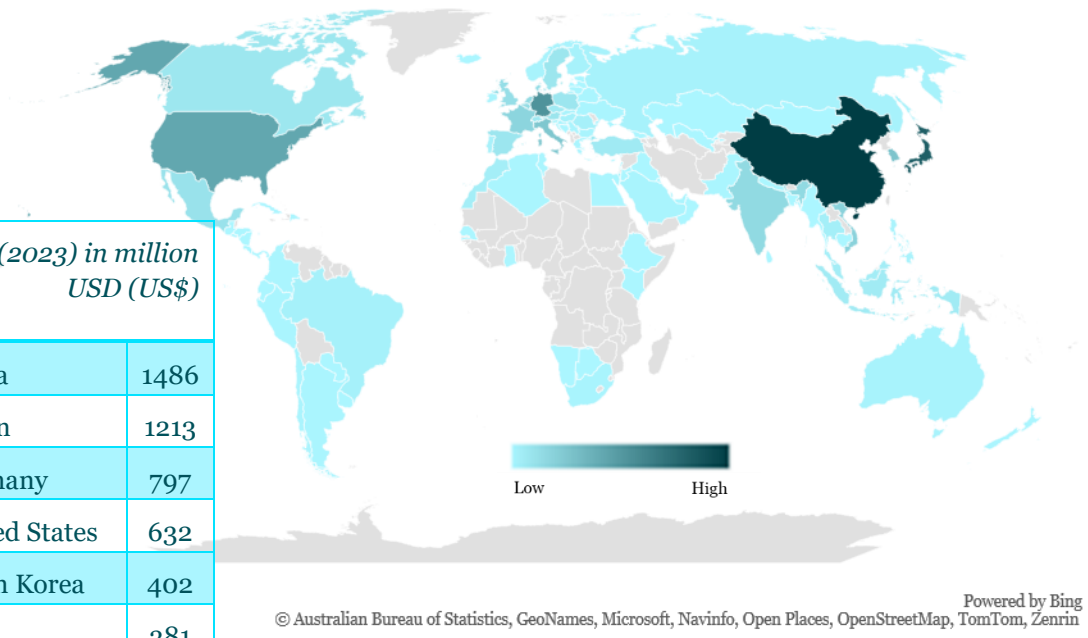
Figure 4: Price Per New Installed Industry Robot



Source: *Statista Market Insights*

Notes: Data shown is using current exchange rates and reflects market impacts of the Russia-Ukraine war.

Figure 5: Revenue Comparison Industrial Robot by Geography, 2024

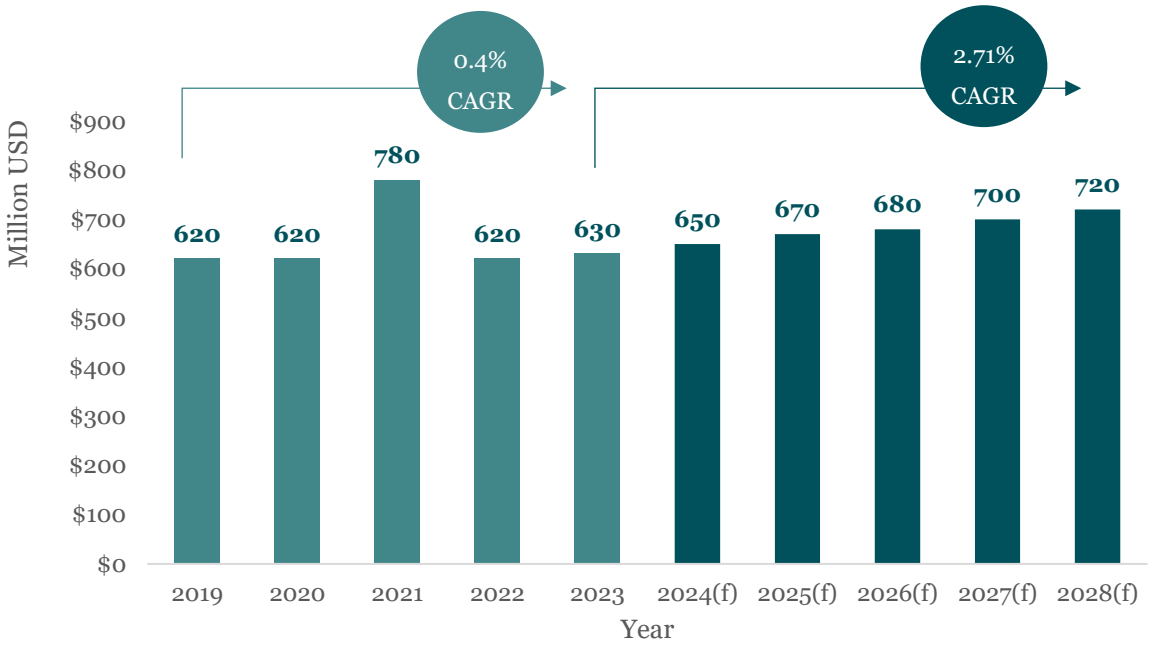


	Top 5 (2023) in million USD (US$)	
1	China	1486
2	Japan	1213
3	Germany	797
4	United States	632
5	South Korea	402
6	Italy	381
7	Vietnam	288
8	France	266
9	India	228
10	Netherlands	227

Source*: Statista Market Insights*

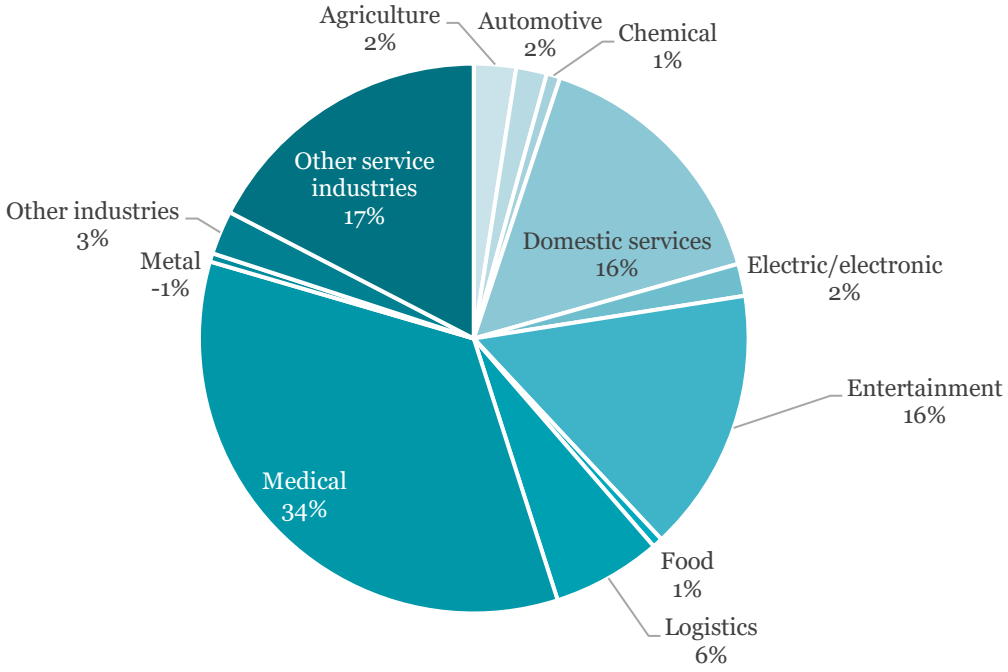
2.2 United States Industrial Robotics Market

Figure 6: United States Industrial Robotics Market Size



Source: *Statista Market Insights*[2]

Figure 7: United States Industrial Robotics Revenue Share (in %) by Segment, 2023



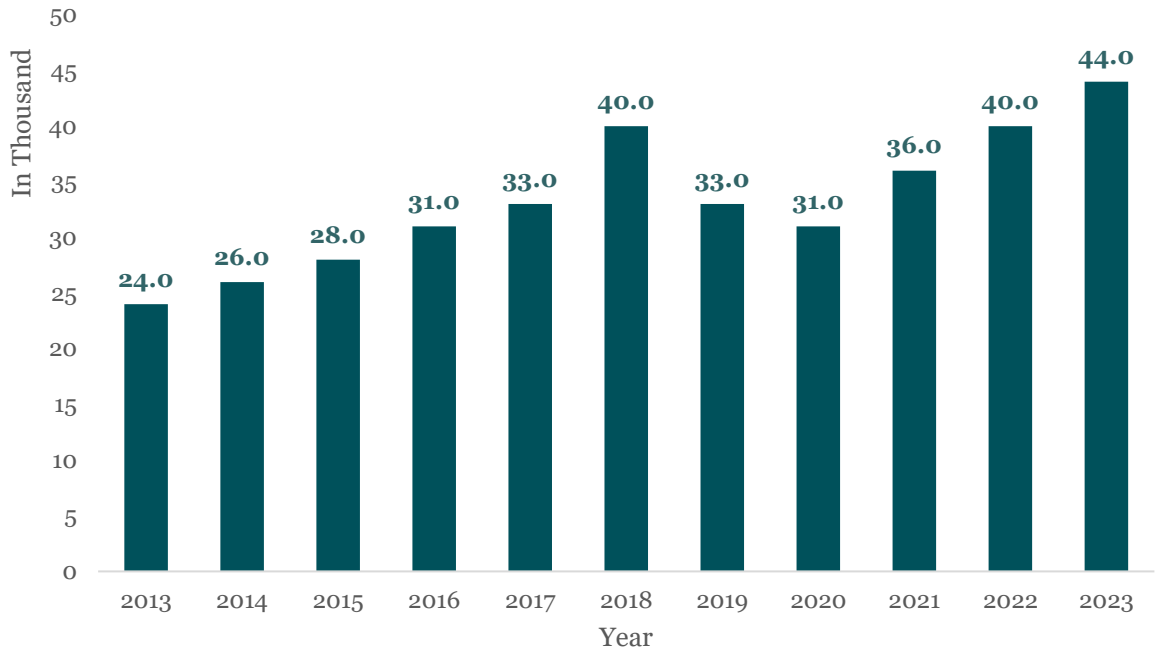
Source: *Statista Market Insights*

Table 1: United States Industrial Robotics Revenue Share (in %) by Segment, 2019 - 2028

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Agriculture	3%	2%	2%	2%	2%	3%	3%	3%	3%	3%
Automotive	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Chemical	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Domestic services	14%	15%	15%	16%	16%	15%	15%	15%	15%	14%
Electric/electronic	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Entertainment	25%	24%	18%	17%	16%	15%	14%	14%	13%	13%
Food	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Logistics	7%	6%	7%	6%	6%	7%	7%	7%	7%	7%
Medical	28%	30%	31%	34%	34%	33%	32%	32%	32%	32%
Metal	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%
Other industries	4%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Other service industries	9%	11%	14%	16%	17%	20%	21%	22%	23%	24%

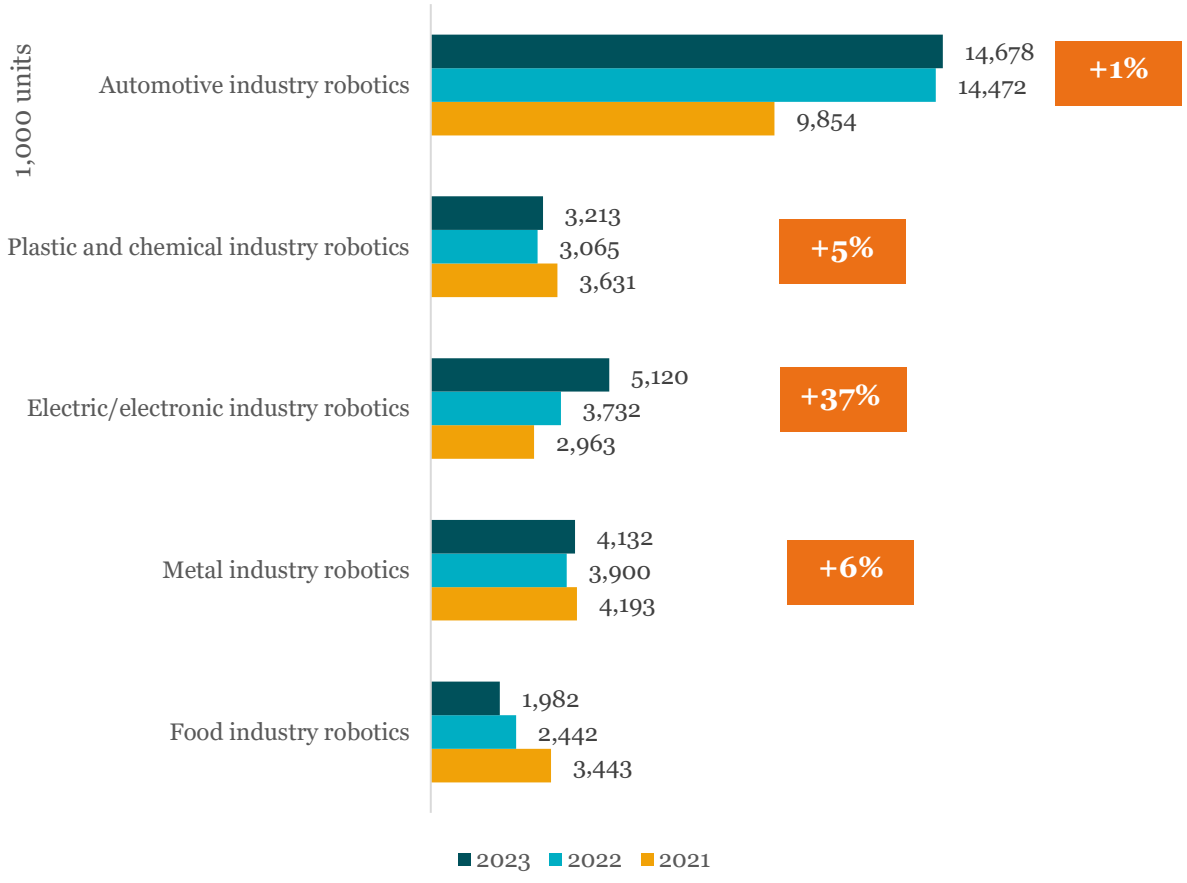
Source: *Statista Market Insights*

Figure 8: United States Annual Installations of Industrial Robots



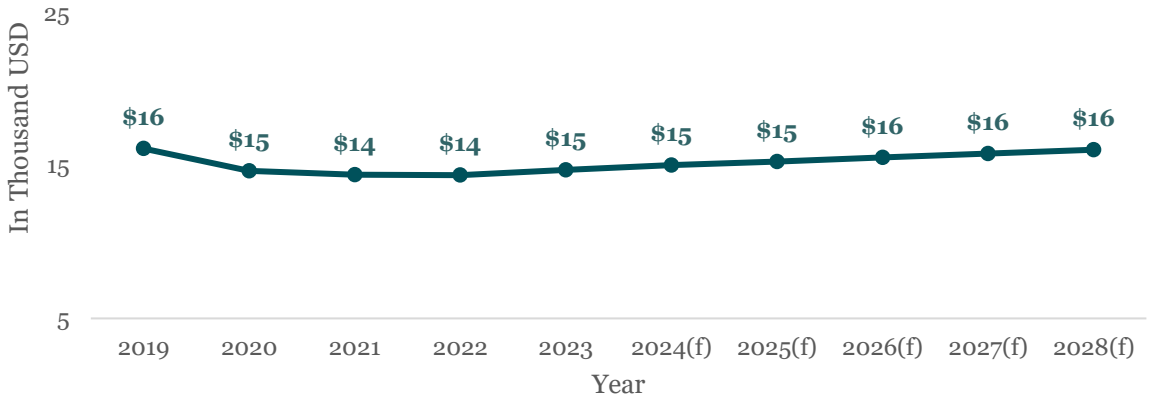
Source: *International Federation of Robotics - preliminary results 2023*[3]

Figure 9: United States Annual Installations of Industrial Robots by Industry



Source: *International Federation of Robotics - preliminary results 2023*[4]

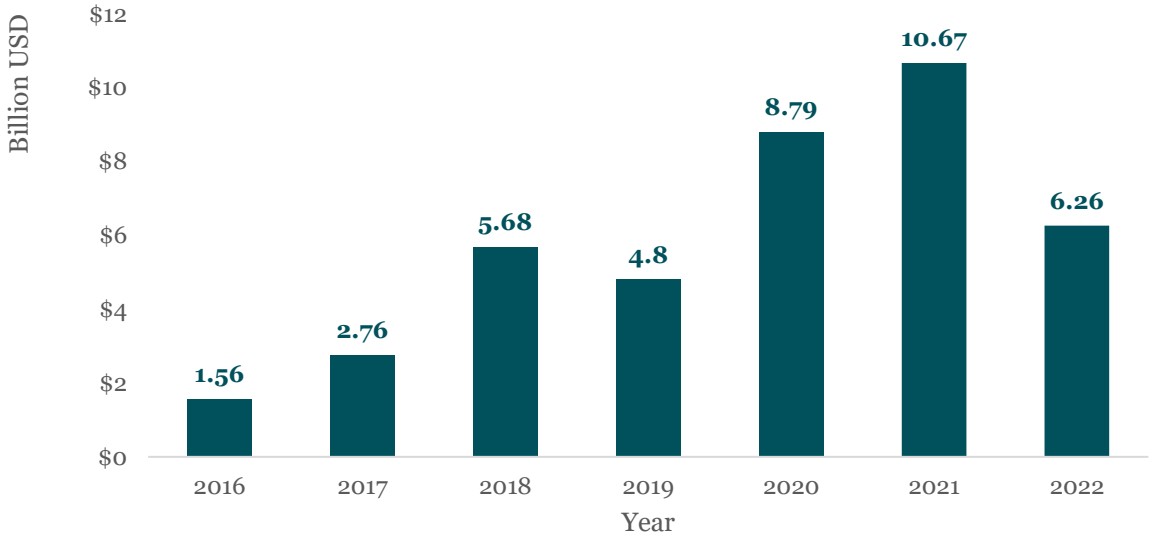
Figure 10: United States Price Per New Installed Industry Robot



Source: *Statista Market Insights*

Notes: Data shown is using current exchange rates and reflects market impacts of the Russia-Ukraine war.

Figure 11: United States Industrial Robotics Investment



Source: *Statista Market Insights*

3. MARKET TRENDS

- Artificial Intelligence and Machine Learning

Robots are increasingly being equipped with AI and machine learning capabilities, enabling them to perform complex tasks with higher accuracy and efficiency. AI algorithms process data from a range of inputs to understand the current state of the environment, predict future events, and make decisions about how to achieve the robot's goals. Machine learning algorithms enable robots to learn from data and adapt to dynamic environments. These advancements allow robots to learn from data, improve performance over time, and adapt to new tasks without extensive reprogramming.[5]

- Enhanced Human-Robot Interaction

Advances in sensors, vision systems, and control technologies are improving human-robot interaction, making it easier for workers to program and operate robots. User-friendly interfaces and intuitive controls are reducing the complexity of deploying and managing robotic systems. Nowadays, with more sophisticated and intelligent sensors, speech, gestures, images, and videos, as well as physiological signals like electroencephalography (EEG) and electrocardiogram (ECG), can be input into robots and recognized by them.[6]

- Humanoid Robots

The emergence of humanoid robots is becoming a significant trend, symbolizing power and technological capability. China and the US are leading this race to mass-produce humanoid robots, likened to a 21st-century space race. Other countries, such as Saudi Arabia and Italy, are also actively pursuing advancements in this field.[7] The world's first humanoid robot factory to open in the US is named Agility Robotics, it claims to be the first ever humanoid robot manufacturing facility in Salem, Oregon with the capability to produce more than 10,000 robots per year with customer deliveries expected to begin in 2024.[8]

- Customization and Flexibility in Manufacturing

Manufacturers are increasingly demanding flexible robotic solutions that can handle small-batch and customized production runs. Robotics systems are being designed to be easily reprogrammable and adaptable to different tasks, supporting trends towards personalization and on-demand manufacturing.[9]

- Sustainability and Energy Efficiency

There is a growing emphasis on developing energy-efficient and sustainable robotic systems. The International Federation of Robotics identified 13 SDGs, where robots help to create a better planet.[10] Manufacturers are focusing on

reducing the environmental impact of their operations by using robots that consume less power and support green manufacturing practices.[11] Glacier, a San Francisco–based company, says its robots can sift through 45 items per minute, including more than 30 different materials, to find items that are recyclable and might otherwise be missed by human detectors.[12]

- Mobile Manipulator

By integrating the mobility of autonomous robotic platforms (AMRs) with the dexterity of manipulator arms, mobile manipulators (or mobile cobots) are unlocking new use cases. This innovation is poised to significantly expand the demand for collaborative robots, opening up a wide range of applications across various industries.[13]

- Focus on Cybersecurity

With the increasing connectivity of robotic systems, there is a heightened focus on cybersecurity. Manufacturers are investing in robust security measures to protect their robotic systems from cyber threats and ensure the integrity of their operations.[14] The technical team of a Spanish cybersecurity company, Alias Robotics, detected more than 100 vulnerabilities in different robots. To this end, they collaborated with robot manufacturers and end users and provided them with Robot Immune System (RIS), an intelligent antivirus that protects robots from cybercriminals from the inside out.[15]

- VR and AR for Training and Remote Assistance

Virtual Reality and Augmented Reality technologies are being employed to train and assist workers on how to use and maintain robotic systems. These immersive training methods enhance understanding, reduce training time, and improve operational safety and efficiency. According to PwC, AR/VR-based maintenance solutions can reduce machinery downtime by up to 50% and increase productivity by 25%.[16]

- Expansion into Emerging Markets

As emerging markets continue to industrialize, there is a rising demand for manufacturing robotics. Industrialization in various developing countries, including India, China, Africa, and others, is anticipated to drive the growth of the industrial robotics market.[17] Additionally, Canada has set a new record of installations of 43% due to a strong demand from the automotive industry.[18]

- Virtual Simulation and Digital Twin

Virtual simulation and digital twin technology are transforming how performance is evaluated before physical implementation. Digital twins utilize real-world operational

data to run simulations and predict outcomes. As a purely computer-based model, the digital twin can be stress-tested and modified without safety concerns, offering significant cost savings and efficiency improvements.[19]

4. SWOT ANALYSIS

4.1 Strengths

- The United States remains a global leader in AI research and development, cultivating a dynamic ecosystem ideal for tech professionals, entrepreneurs, and researchers. The nation's innovative spirit is showcased by numerous startups and tech giants, all advancing the frontiers of artificial intelligence, robotics, and digital transformation.[20]

- Total installations of industrial robots rose by 12% and reached 44,303 units in 2023, as U.S. manufacturers invested heavily in more automation. The USA has a robust industrial base with diverse sectors such as automotive, aerospace, and

Photo by Lenny Kuhne on Unsplash

electronics, which are key users of robotics.[21] This diverse demand drives the adoption and development of manufacturing robotics.

- Government initiatives, e.g., the National Robotics Initiative (NRI) and Robotics grants by the National Science Foundation, for advanced manufacturing technologies, including robotics, provide a supportive environment for growth. Programs like the Manufacturing USA institutes help foster innovation and collaboration in the industry.

- With numerous manufacturing facilities equipped with legacy production machinery and facing high labor costs, the U.S. demonstrates strong potential for automation. Embracing manufacturing robotics can significantly reduce operational costs and enhance efficiency in these environments.

- The scalability of robots in the US market is a significant strength, driven by advanced manufacturing infrastructure and robust technological expertise. The flexibility and adaptability of robotic systems allow for seamless integration across various industries, from small enterprises to large-scale production facilities. This scalability ensures that businesses can efficiently expand their automation capabilities, enhance productivity, and stay competitive in a rapidly evolving market.

4.2 Weaknesses

- The significant capital expenditure required for purchasing and installing robotic systems can be a barrier. Training employees to operate and maintain these systems adds to the costs. This high initial investment can be a deterrent for smaller manufacturers.

- Integrating robotics with existing manufacturing processes and systems can be challenging. Specialized technical knowledge is required for installation and troubleshooting. These complexities can delay deployment and increase operational costs.

- Unexpected downtime due to mechanical or software issues can disrupt operations. Regular maintenance is essential to ensure smooth functioning, adding to operational costs. Downtime and maintenance requirements can affect overall productivity.

- Automation can lead to job losses in roles that become redundant, causing workforce resistance. The social implications of job displacement need to be managed carefully. This can result in negative perceptions and resistance to robotic adoption.

4.3 Opportunities

- The adoption of Industry 4.0 technologies offers opportunities for more advanced robotic systems. Integration with cloud computing and big data

analytics enhances manufacturing capabilities. Smart manufacturing creates new possibilities for efficiency and innovation.[22]

- Developing energy-efficient robots and sustainable manufacturing processes is a growing focus. Robotics can support recycling and waste management, promoting a circular economy. This aligns with the increasing emphasis on sustainability in manufacturing.[23]

- The Congressional Budget Office recently projected that the U.S. labor force will grow at a modest annual rate of 0.2% from 2024 to 2031. By 2030, it is anticipated that over 2.1 million manufacturing jobs in the U.S. will remain unfilled, driving up the demand for manufacturing robotics. The demand for robots will be especially strong in countries where companies plan to re-shore or near-shore operations to enhance supply chain stability amidst global uncertainties. According to a 2022 survey by ABB Robotics involving 1,610 companies, 70% of U.S. businesses intend to re-shore or near-shore their operations, and 62% plan to invest in robotic automation within the next three years.[24]

- The US collaborative robot market has experienced remarkable expansion in recent years US Collaborative Robot Market Size was valued at USD 300.2 Billion in 2022. The collaborative robot market industry is projected to grow from USD 402.27 Billion in 2023 to USD 4181.71 Billion by 2032, exhibiting a compound annual growth rate (CAGR) of 34% during the forecast period (2024 - 2032). Cobots are easier to deploy, program, and integrate into existing workflows. They offer a practical solution for enhancing human-robot collaboration in manufacturing.[25]

- With a market size of approximately 762 million U.S. dollars in 2021, the North American market for autonomous mobile robots (AMR) is projected to expand at a compound annual growth rate (CAGR) of around 23%. By 2028, it is expected to exceed 3.2 billion U.S. dollars.[26]Autonomous mobile robots are being widely adopted for tasks such as material handling and logistics within manufacturing facilities. AMRs can navigate dynamic environments, optimize workflows, and improve overall operational efficiency.[27]

- The US robotics market has witnessed remarkable growth in the medical robotics sector. Robotic surgery systems, rehabilitation robots, and telepresence robots are revolutionizing healthcare practices.[28]

- The electronics manufacturing robotics sector has shown remarkable adaptability, achieving a 35% year-over-year growth in 2023. With the electric and electronic industry robotics market projected to reach a volume of US$2.62 billion in 2024, there is a significant opportunity for continued innovation and expansion in this high-growth area.[29]

- The Robot as a Service (RaaS) business model is gaining traction, allowing companies, especially SMEs, to lease or subscribe to robotic solutions instead of making large capital investments. The global Robot as a Service (RaaS) market had a market size value of $1.8 billion in 2023 and is poised to reach $4 billion by 2028, reflecting a remarkable CAGR of 17.4%. While logistics and handling applications have a lead role in driving the market growth. These numbers underscore the widespread adoption of RaaS across diverse industries, highlighting its pivotal role in the future of automation.[30]

- The sanctions on Chinese companies, including SoftBank-backed CloudMinds, present a significant opportunity for the US robotics market. With CloudMinds known for its cloud-based AI service powering the humanoid robot Pepper, US robotics manufacturers can capitalize on this situation by innovating, developing, and strengthening their robotics capabilities domestically.[31]

4.4 Threats

- Cybersecurity incidents in the robotics industry are expected to increase as the number of connected robots rises, with 45% of organizations reporting at least one security incident in the past year. Increased connectivity exposes robotics systems to cybersecurity threats which can disrupt manufacturing processes, leading to significant losses.[32]

- Studies indicating robots' dramatic job displacement potential generally emphasize the technical feasibility of workplace automation. This focus makes them overestimate the potential adverse effects of robots, especially for developing countries, as it neglects to take into account that what is technically feasible is not always also economically profitable.[33]

- Navigating the complex regulatory environment in the USA can be challenging. Compliance with safety standards, labor laws, and other regulations requires careful management and can add to operational costs.

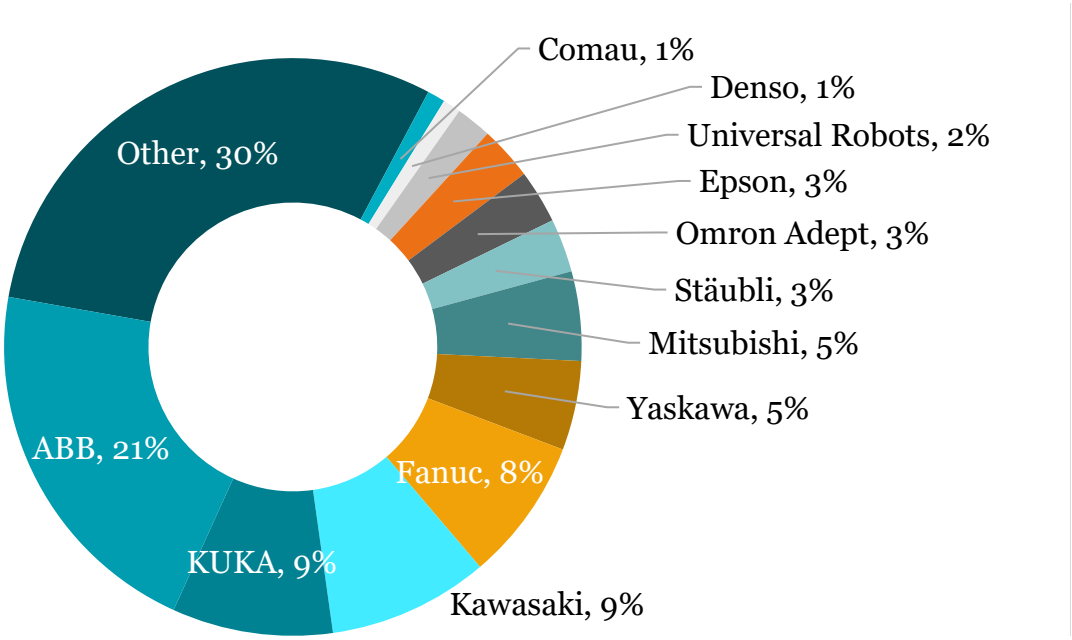
- Economic events can reduce investment in capital-intensive robotic systems such as the COVID-19 pandemic and the Russia-Ukraine war which slowed down the growth of the Industrial Robotics segment because of disrupted supply chains and the semiconductor shortage.[34] This makes the market vulnerable to broader economic conditions.

- Intense competition from established players and new entrants creates market pressure. Companies need to innovate continuously and reduce costs to maintain their position in such a fast pace of technological advancements. This competitive environment demands strategic agility, R&D, and huge investment.

5. COMPETITION OVERVIEW

5.1 Industrial Robots Competitive Landscape

Figure 12: The Giants of Industrial Robotics



Source: *Statista Market Insights*[35]

Table: Top Players Financial Overview

		Revenue (US $ millions)			Operating Profit (US $ millions)		
#	**Company**	**2023**	**2022**	**Change**	**2023**	**2022**	**Change**
1	ABB	32,235	29,446	9%	4,871	3,337	46%
2	Kawasaki	12,770	12,261	4%	603	374	61%
3	KUKA	4354.6	4186.24	4%	18.91	18.8	1%
4	Fanuc	6,304	6,524	-3%	1,416	1,631	-13%
5	Mitsubishi Electric	159,633	153,657	4%	7,048	6,397	10%

Source: *Annual Reports*

5.2 Company Profile

5.2.1 ABB

ABB - Company Overview

#	Item	Contents
1	Legal Name	ABB
2	Website	www.global.abb/group/en
3	LOGO	
4	Company Description	ABB is a leading supplier of industrial robots and robot software, equipment, and complete application solutions. They are operating in 53 countries and have installed more than 500,000 robots. It is a technology leader in electrification and automation, enabling a more sustainable and resource-efficient future.
5	Founded	1988
6	Headquarters	Zurich, Switzerland
7	Sales by type	84% Products and solutions 16% Services
8	Revenue (2023)	$32 billion
9	Employees as of (2023)	>105,000
10	Core Business Segments	Electrification Motion Process Automation Robotics & Discrete Automation Corporate and Other

ABB - Company Financials

Figure 13: ABB Net Income in USD Million (2018-2023)

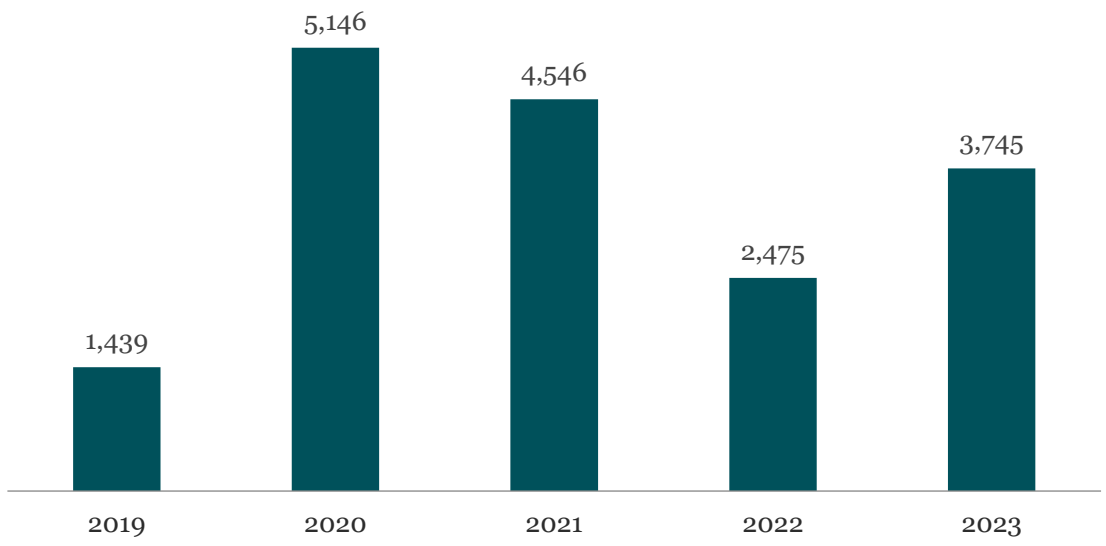


Figure 14: ABB Gross Profit in USD Million (2019-2023)

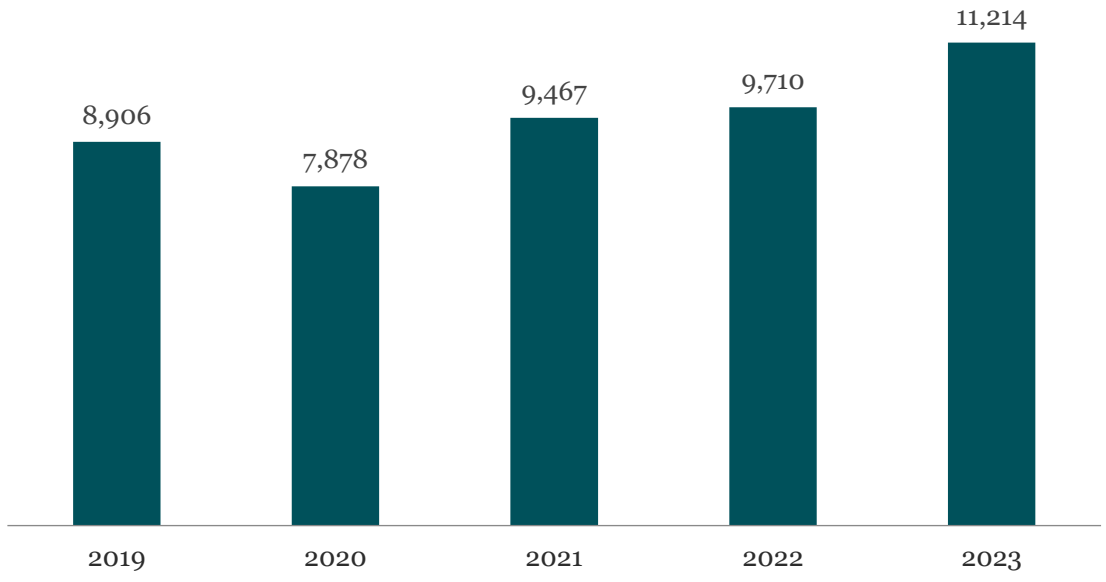


Figure 15: ABB Revenue Share (%), by Geography (2023)

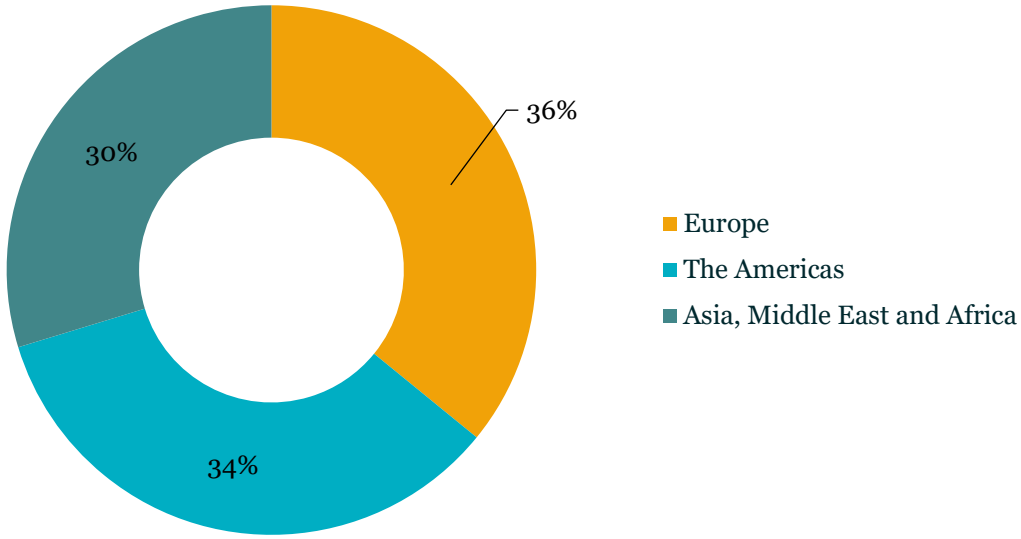


Figure 16: ABB Revenue Share (%), by Operating Segments (2023)

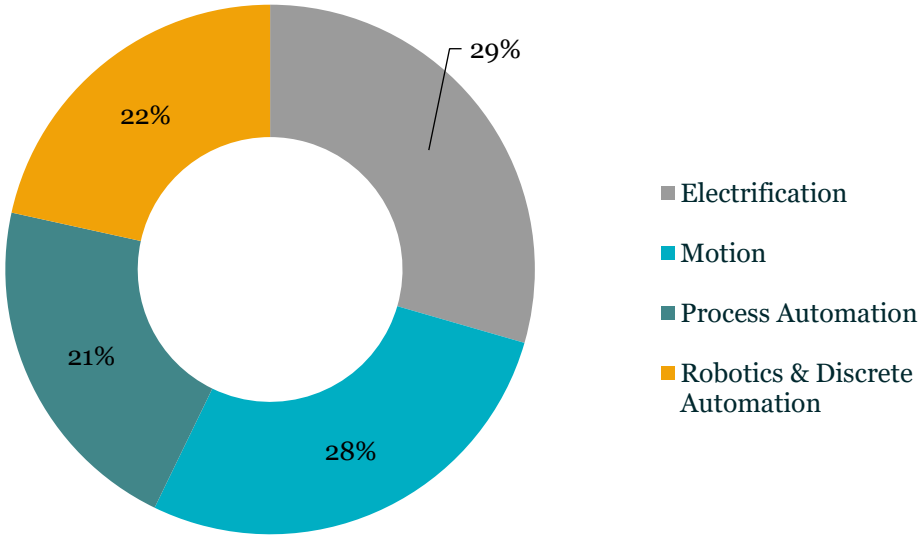


ABB - Market Overview

Core Solutions and Product Offerings	Electrification and Automation, Industrial robots, and Robot software. The company's solutions connect engineering know-how and software to optimize how things are manufactured, moved, powered, and operated.
Market Segment	Electrification Motion Process Automation Robotics & Discrete Automation Corporate and Other
Company Vertical	Automotive, Construction, Education, Food & Beverage, Electronics, Logistics, Life sciences & Healthcare, Metal fabrication, and Foundry & forging.
Company Highlights	• $280 million investment announced in European robotics hub in Sweden, expanding production capacity by 50%. • $170 million investment was announced in various sites in the US to meet increasing demands for electrification and automation solutions, creating approximately 400 new jobs. • They already have more than 100 AI-focused projects across the ABB Group. • Expanded partnership with battery developer Northvolt to provide electrification and automation technologies for the world's largest battery recycling facility, Revolt Ett. • In 2023, nine venture capital investments were undertaken by ABB, including an investment in US-based WindESCo, an analytics software provider for wind turbines, enabling ABB to offer customers a package that combines converters with performance monitoring.

ABB Industrial Robotics – Products and Strategies

Products*	Strategies
– SCARA Robot IRB 930 – SWIFTI™ CRB 1300 – GoFa™ CRB 15000 – Articulated Robot IRB 1300 – Dual-arm YuMi IRB 14000 – Single-arm YuMi IRB 14050 – IRB 6740 – IRB 6730 – Articulated Robot IRB 1010 Mini robot – Delta Robot IRB 365 FlexPicker – Paint Robot IRB 5510 – SWIFTI™ CRB 1100 – SCARA Robot IRB 910INV	• Highlighting ABB's commitment to sustainability in all marketing communications, focusing on how ABB's robotics solutions contribute to more sustainable manufacturing processes. • Regularly updating the ABB blog with insightful articles, interviews, and updates related to industrial robotics. • Using virtual tours, videos, and interactive content to showcase ABB's cutting-edge research and development. • Working closely with key customers to develop customized solutions and case studies that can be shared as success stories. • Organizing live demonstrations and interactive sessions to showcase the capabilities and benefits of ABB's robots. • Using platforms like LinkedIn, Twitter, Facebook, and YouTube to share industry news, product updates, and behind-the-scenes looks at ABB's innovation. • Developing segmented email campaigns to keep potential and existing customers informed about new products, features, and industry trends. • Forming partnerships with other technology leaders and research institutions to co-develop innovative solutions. • Promoting any awards and recognitions ABB receives for its industrial robotics solutions.

*Note: The product list is not exhaustive.

5.2.2 Kawasaki

Kawasaki - Company Overview

#	Item	Contents
1	Legal Name	Kawasaki Heavy Industries
2	Website	www.global.kawasaki.com
3	LOGO	Kawasaki Powering your potential
4	Company Description	With about 100 group companies in Japan and overseas, Kawasaki Heavy Industries oversees the formation of a technology corporate group. Their technological capabilities, polished over a century, send diverse products forth into wide-ranging fields that go beyond land, sea, and air, extending from the ocean depths to space.
5	Founded	1896
6	Headquarters	Tokyo, Japan
7	Sales by type	Products and Solutions
8	Revenue (2023)	$12,770 Million
9	Employees as of (2022)	38,254
10	Core Business Segments	Aerospace Systems Rolling Stock Energy Solution & Marine Engineering Precision Machinery & Robot Powersports & Engine Other

Kawasaki - Company Financials

Figure 17: Kawasaki Net Income in USD Million (2019-2023)

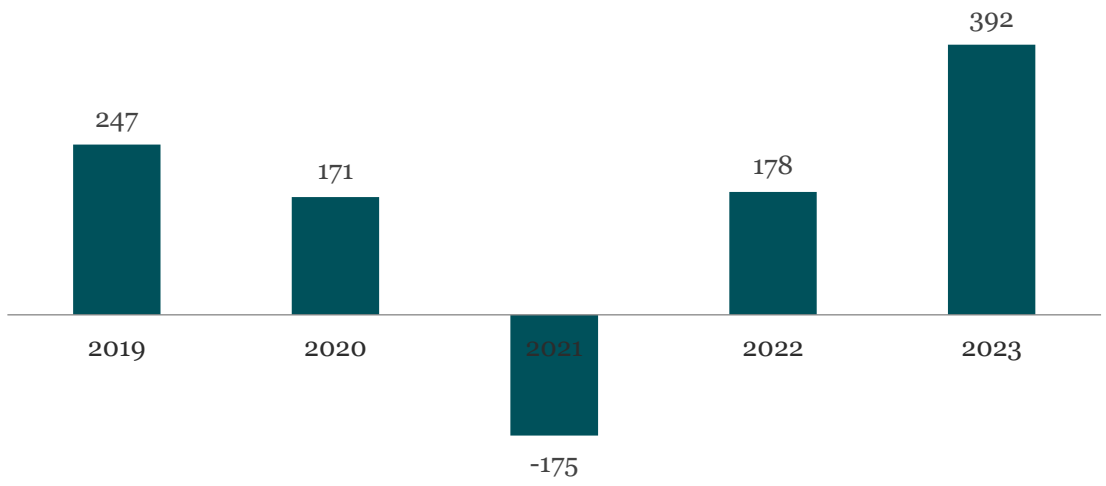


Figure 18: Kawasaki Gross Profit in USD Million (2019-2023)

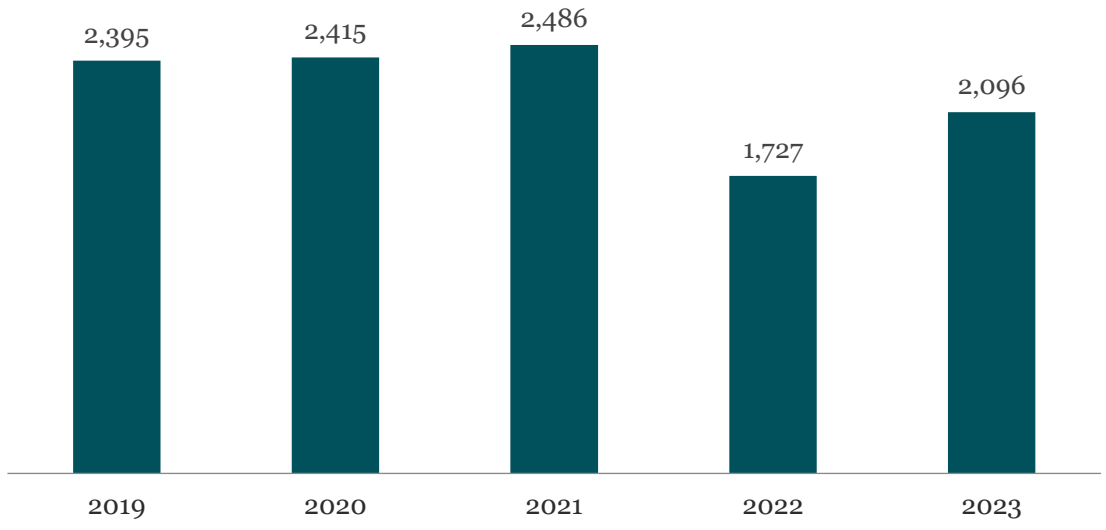


Figure 19: Kawasaki Revenue Share (%), by Geography (2022)

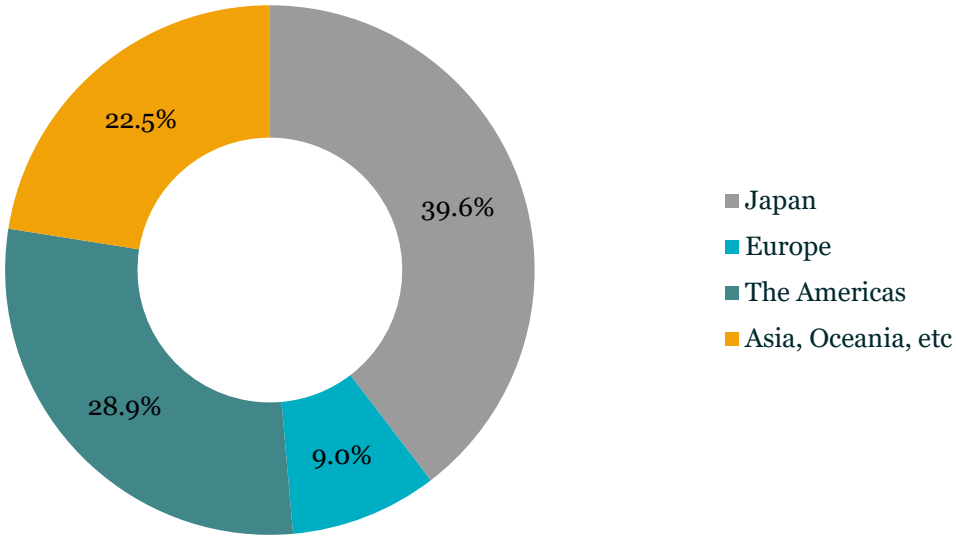
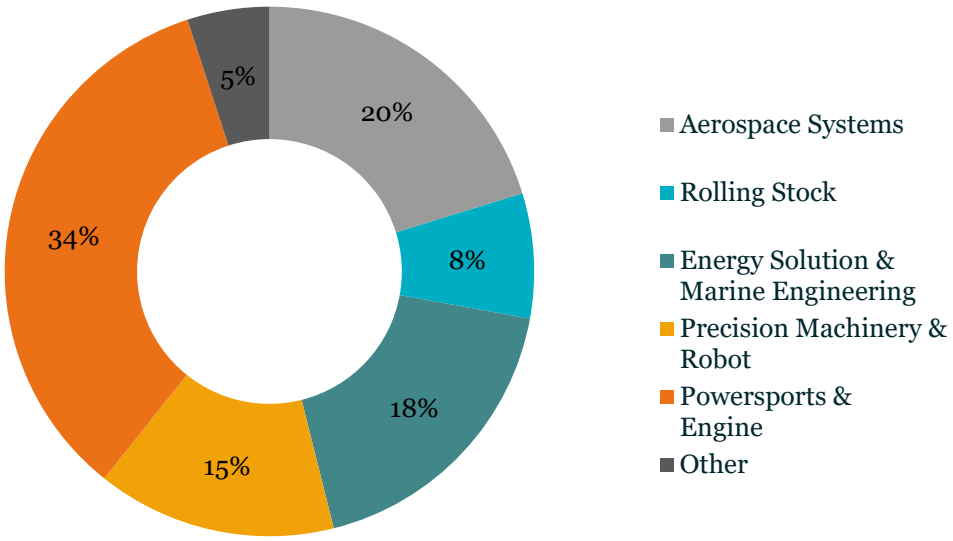


Figure 20: Kawasaki Revenue Share (%), by Operating Segments (2022)



Kawasaki - Market Overview

Core Solutions and Product Offerings	Their aerospace division is active in products ranging from aircraft to satellites. The products that their rolling stock division delivers include Shinkansen and New York subway cars, while their ship and offshore structure division's products range from gas carriers and large tankers to submarines. Their energy solutions division covers the spectrum from the development and manufacture of energy equipment to management systems. They are also active in wide-ranging businesses driven by diverse and high-level engineering technologies, including environmental and recycling plants, industrial plants, precision machinery, industrial robots, and infrastructure equipment.
Market Segment	Aerospace Systems Rolling Stock Energy Solution & Marine Engineering Precision Machinery & Robot Powersports & Engine Other
Company Vertical	Aerospace, Automotive, Defense, and Industrial manufacturing
Company Highlights	• Over 90% of long-term financing in fiscal 2022 was sustainable finance. • In fiscal 2022, on the one hand, they achieved their highest ever revenue for robots for semiconductor manufacturing equipment, but on the other, they struggled due to the tight lockdown policy and stagnation of the construction machinery market in China. • In the field of robotics, they aim to improve their profitability through open innovation. They plan to tap new fields with high levels of growth potential, such as medical care and logistics. • Kawasaki also presented other robots, such as Nyokkey, a social robot, relating to a safe and secure remotely connected society and near-future mobility.

Kawasaki Industrial Robotics – Products and Strategies

Products*	Strategies
– RS080N – BX130X – BX200L – DuAro1 – DuAro2 – MX350L – MG15HL – MT400N – CP180L – RD080N – YF002N – MC004N – MS005N – BA006N – RS015X – KF121	• Highlighting Kawasaki's century-long heritage of technological innovation and excellence in industrial robotics. • Emphasizing the reliability, precision, and advanced capabilities of Kawasaki's robotic solutions, showcasing their suitability for diverse industrial applications. • Using messaging that conveys Kawasaki's role as a trusted partner in automation, capable of delivering solutions tailored to local and global markets. • Offering co-branded marketing opportunities to showcase successful implementations and customer satisfaction. • Participating in major industry trade shows and exhibitions to showcase Kawasaki's latest robotic innovations. • Ensuring the Kawasaki website is optimized for ease of navigation and rich in information on industrial robotics, including detailed product specs, application videos, and customer testimonials. • Using industry-specific messaging and visuals to connect with target audiences and address their unique needs. • Highlighting Kawasaki's commitment to sustainability and how its robotic solutions contribute to greener manufacturing processes.

*Note: The product list is not exhaustive.

5.2.3 KUKA

KUKA - Company Overview

#	Item	Contents
1	Legal Name	KUKA
2	Website	www.kuka.com
3	LOGO	KUKA
4	Company Description	KUKA is a global automation corporation with sales of around 4 billion euros and around 15,000 employees. As one of the world's leading suppliers of intelligent automation solutions, KUKA offers customers everything they need from a single Source.
5	Founded	1898
6	Headquarters	Augsburg, Germany
7	Sales by type	Products and Services Solutions
8	Revenue (2023)	$4354.6 million
9	Employees as of (2023)	14,726
10	Core Business Segments	Robot systems Product machines Autonomous mobile robots Process technologies

KUKA - Company Financials

Figure 21: KUKA Net Income in USD Million (2019-2023)

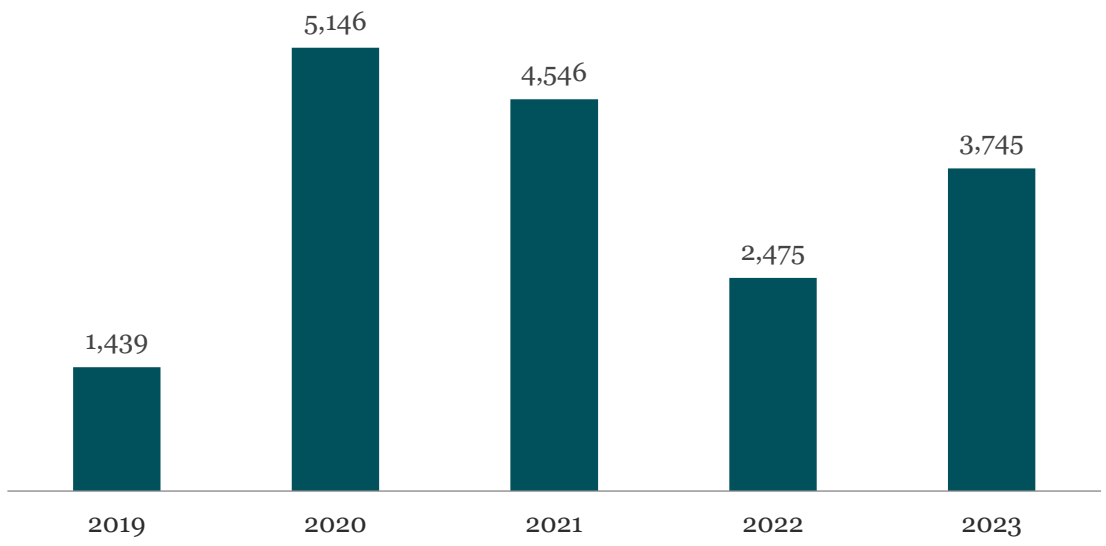


Figure 22: KUKA Gross Profit in USD Million (2019-2023)

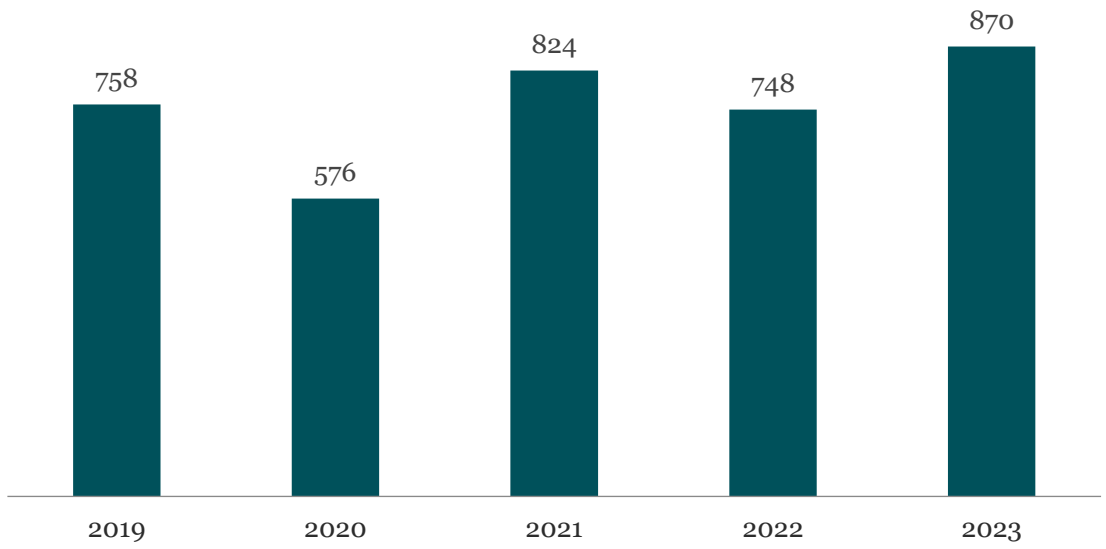


Figure 23: KUKA Revenue Share (%), by Geography (2023)

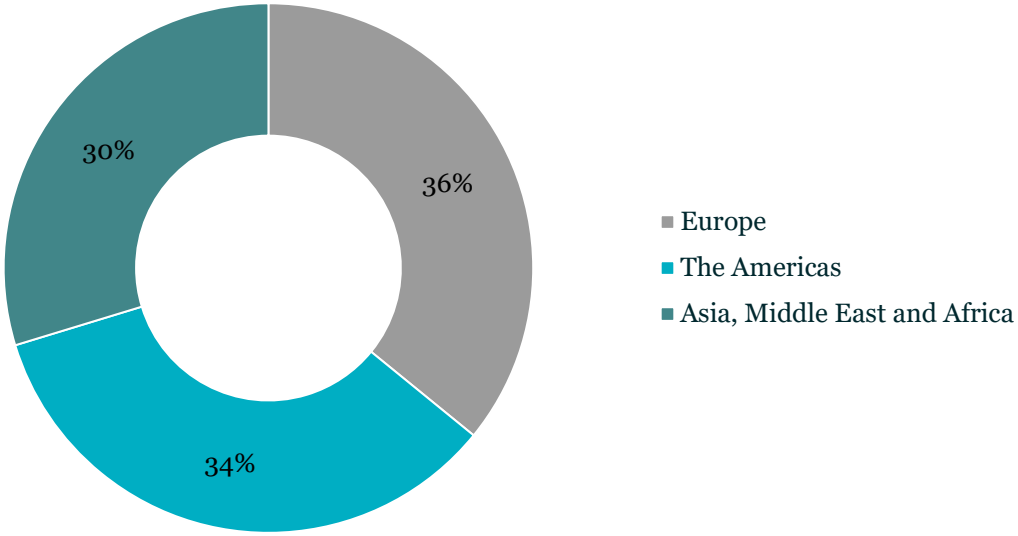
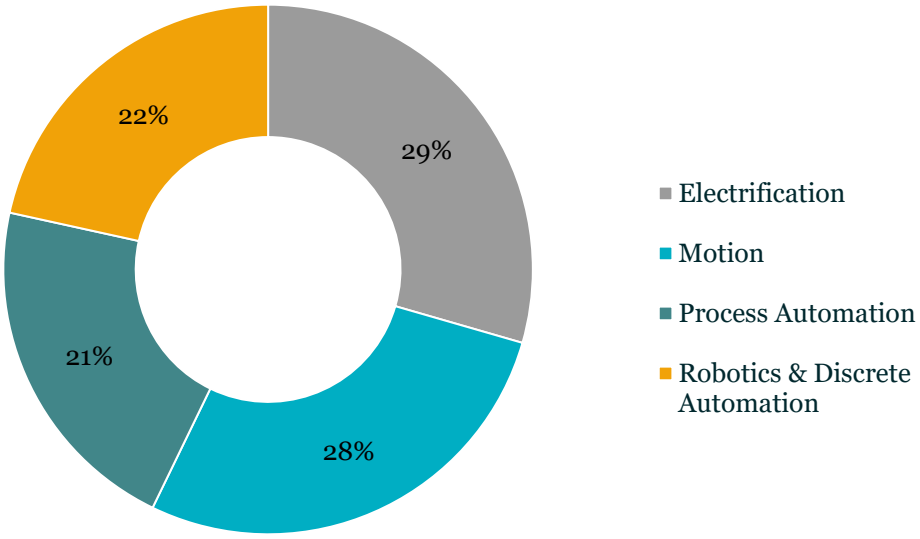


Figure 24: KUKA Revenue Share (%), by Operating Segments (2023)



KUKA - Market Overview

Core Solutions and Product Offerings	From robots and cells to fully automated systems and their connectivity in markets such as automotive with a focus on e-mobility & battery, electronics, metal & plastic, consumer goods, e-commerce, retail, and healthcare.
Market Segment	Robot systems Product machines Autonomous mobile robots Process technologies
Company Vertical	Automotive, Electronics, Metal & plastics, E-commerce & retail, Consumer goods, and Healthcare
Company Highlights	• Industries 4.0 – the next stage of the Industrial Revolution – is bringing digital, networked production, flexible manufacturing concepts, and logistics solutions, as well as new business models to the fore. With its decades of experience in automation, in-depth process know-how, and cloud-based solutions, KUKA ensures its customers have an edge over the competition • KUKA Robotics is continuously expanding its range of products and services to be able to offer customers suitable solutions from a wide variety of industries – particularly in markets such as automotive with a focus on e-mobility & battery, electronics, metal & plastic, consumer goods, e-commerce, retail, and healthcare. • KUKA also offers small and medium-sized companies simple and economical entry into automation.

KUKA Industrial Robotics – Products and Strategies

Products*	Strategies
– KR DELTA – KR SCARA – KR AGILUS – LBR iisy Cobot – KR CYBERTECH Nano – LBR iiwa – KR IONTEC – KR 40 PA – KR QUANTEC – KR 300-2 PA – KR FORTEC – KR 470-2 PA – KR 1000 Titan – KR 700 PA – KR FORTEC ULTRA – KR CYBERTECH Arc	• Emphasizing KUKA's capability to provide complete, intelligent automation solutions from a single Source, ensuring seamless integration and efficiency. • Highlighting the breadth and depth of KUKA's product offerings in industrial robotics, from simple robotic arms to complex automated systems. • Showcasing KUKA's position as a leading innovator in the industrial robotics market, leveraging advanced technologies like AI, machine learning, and IoT. • Highlighting successful implementations in key sectors such as automotive, electronics, and logistics to demonstrate tangible benefits and ROI. • Ensuring the KUKA website provides comprehensive information on industrial robotics, including detailed product specifications, application examples, and customer success stories. • Organizing live demonstrations and interactive sessions to allow attendees to experience the capabilities of KUKA's robots firsthand. • Working closely with key customers to develop customized solutions and case studies that demonstrate the value of KUKA's robotics.

*Note: The product list is not exhaustive

5.2.4 Fanuc

Fanuc - Company Overview

#	Item	Contents
1	Legal Name	FANUC CORPORATION
2	Website	www.fanuc.com
3	LOGO	FANUC
4	Company Description	FANUC is active in the fields of FA, which encompasses basic technologies, consisting of NCs (numerical controls), servos and lasers, and Robots to which such basic technologies are applied, as well as Robomachines. Its industrial robots are general-purpose robots and are used in many industry sectors.
5	Founded	1972
6	Headquarters	Japan
7	Sales by type	Products and Solutions Services
8	Net Sales (2023)	$6,304 Million
9	Employees as of (2023)	9,432
10	Core Business Segments	FA Robots Robomachine Services

Fanuc - Company Financials

Figure 25: Fanuc Net Income in USD Million (2019-2023)

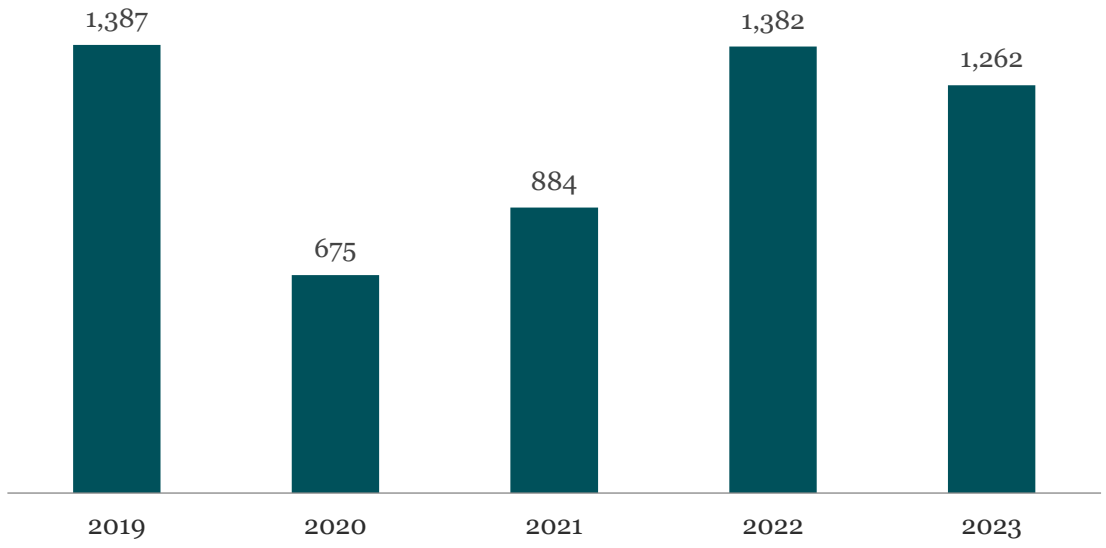


Figure 26: Fanuc Gross Profit in USD Million (2019-2023)

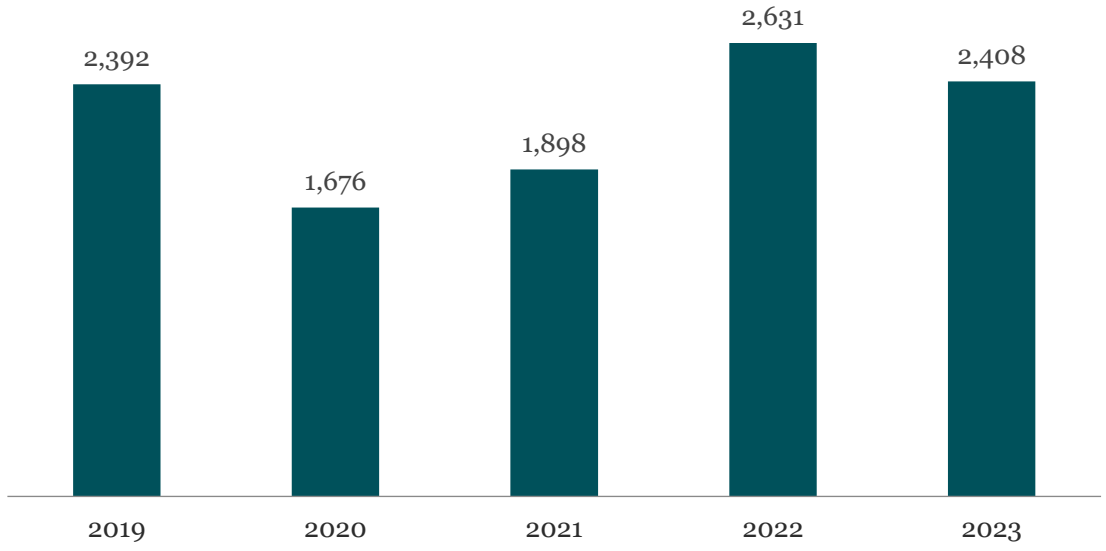


Figure 27: Fanuc Revenue Share (%), by Geography (2023)

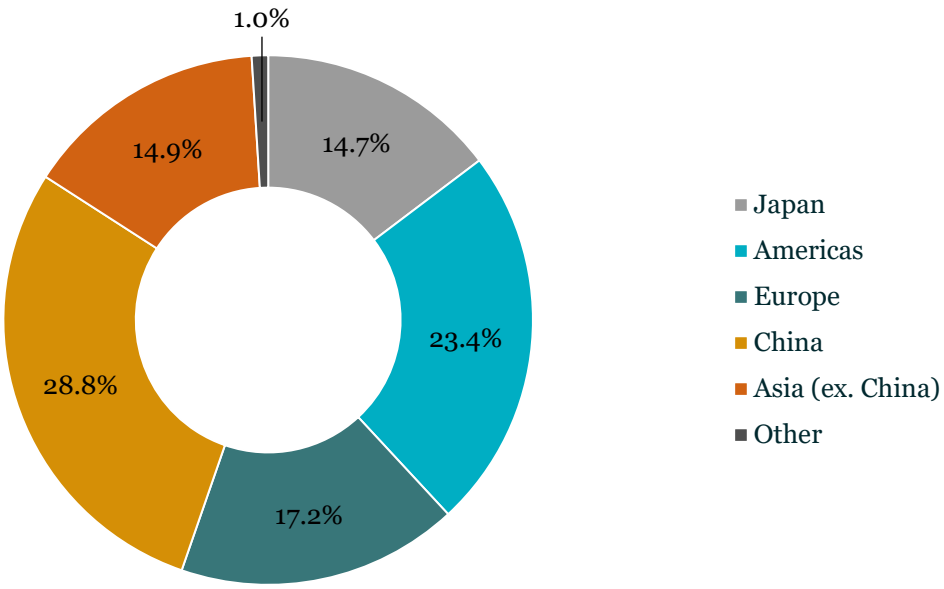
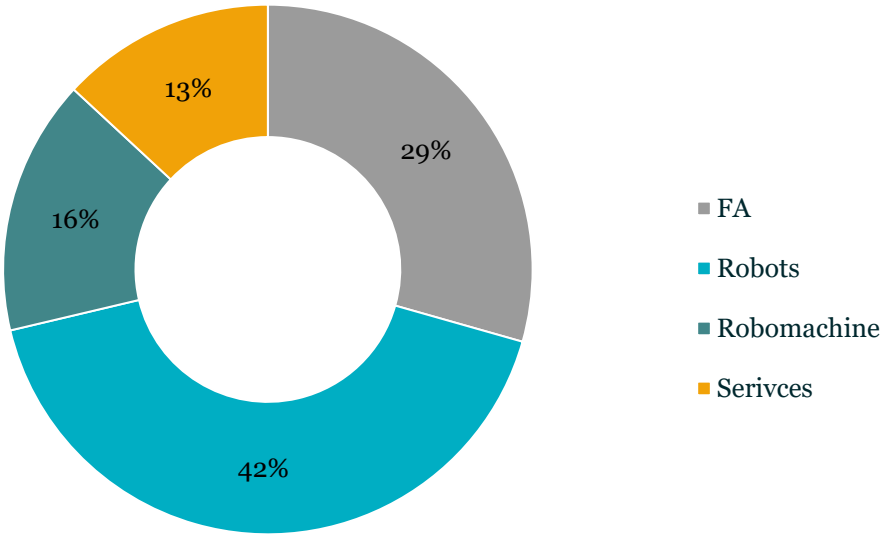


Figure 28: Fanuc Revenue Share (%), by Operating Segments (2023)



Fanuc - Market Overview

Core Solutions and Product Offerings	Their industrial robots, which include types for welding, material handling (transportation of articles), assembly, and painting, according to application, are used in wide-ranging industries, including automotive, electronic parts, logistics, food, pharmaceuticals, and cosmetics.
Market Segment	FA Robots Robomachine Services
Company Vertical	Manufacturing industries, CNC systems, and factory automation
Company Highlights	• FANUC has set a mid-term goal (certified by the SBT Initiative) to reduce its Scope 1,2 emissions by 42% from the FY2020 level by 2030 and is promoting efforts to achieve this goal. • It is committed to promoting the training of the younger generation and preparing them for careers in robotics. This commitment reflects our contribution to global social and industrial development. • The company has completed the buyback of approximately 25 billion yen of its common shares but has not reached the limit of 50 billion yen. • Capital investments in the automotive and other manufacturing sectors across the board were brisk during the year ended March 31, 2023. Meanwhile, the future outlook remained uncertain due to several issues, such as the impact of the shortage of semiconductors and other components on production activities, surging prices of raw materials, and the drastic exchange rate fluctuations.

Fanuc Industrial Robotics – Products and Strategies

Products*	Strategies
– Robot CR – 10iA – Robot CR – 4iA – Robot CR – 7iA – Robot CR – 35iA – Robot CR – 15iA – Robot SR – 3iA – Robot LR Mate 200iD – Robot ARC Mate 100iD – Robot M-710iC – Robot R–2000iC – Robot M-900iB – Robot P-250iB – Robot DR-3iB	• Collaborating with universities and technical schools to promote robotics education and training. • Sponsoring robotics competitions and workshops to engage the next generation of engineers and technicians. • Positioning FANUC as a provider of complete automation solutions that address the entire production process. • Communicating the benefits of FANUC's robots as adaptable and scalable solutions for various industrial applications • Developing educational content such as how-to videos, webinars, and online demonstrations to showcase the features and benefits of FANUC's robotic solutions. • Developing segmented email campaigns to keep potential and existing customers informed about new products, updates, and industry insights. • Participating in major industry trade shows and exhibitions to showcase FANUC's latest robotic innovations.

*Note: The product list is not exhaustive.

5.2.5 Mitsubishi Electric

Mitsubishi Electric - Company Overview

#	Item	Contents
1	Legal Name	Mitsubishi Electric
2	Website	www.mitsubishielectric.com
3	LOGO	MITSUBISHI ELECTRIC Changes for the Better
4	Company Description	The Mitsubishi Electric Group is committed to providing products, systems, and solutions in its wide-ranging business fields (business areas and segments. It aims to continually improve its technologies and services by applying creativity to all aspects of its business.
5	Founded	1921
6	Headquarters	Tokyo, Japan
7	Sales by type	Products and Solutions
8	Revenue (2023)	$159,633 Million
9	Employees as of (2023)	149,134
10	Core Business Segments	Infrastructure Industry & Mobility Life Business Platform Semiconductor & Device Others

Mitsubishi Electric - Company Financials

Figure 29: Mitsubishi Electric Net Sales in USD Billion (2019-2023)

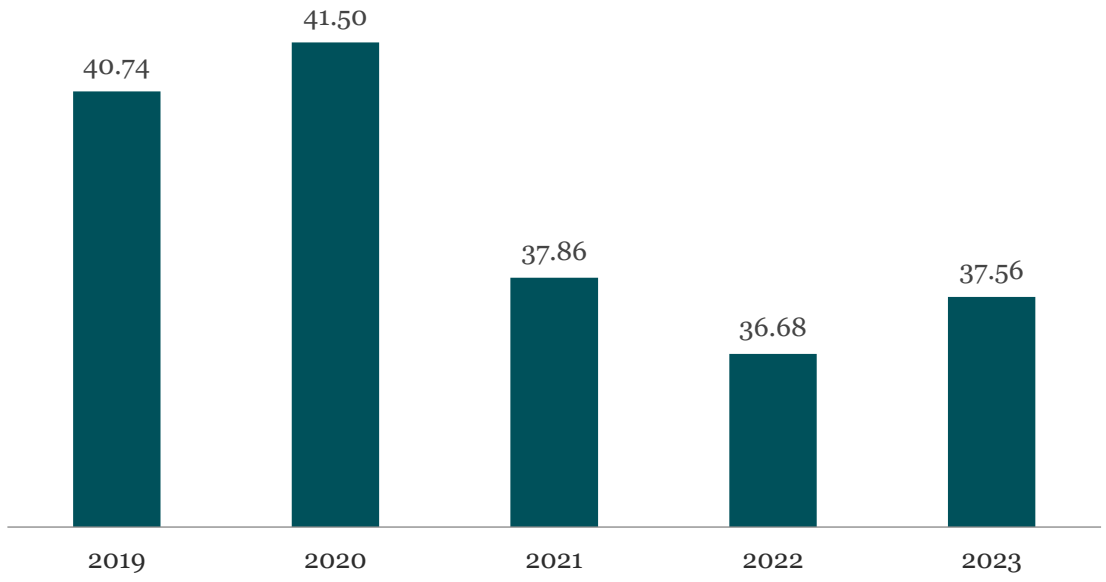


Figure 30: Mitsubishi Electric Gross Profit in USD Million (2019-2023)

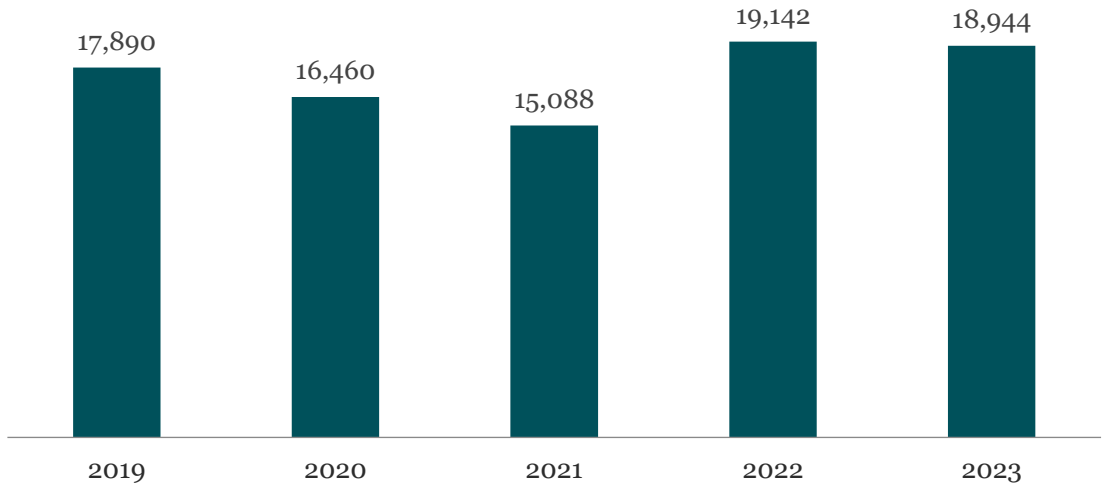


Figure 31: Mitsubishi Electric Revenue Share (%), by Geography (2023)

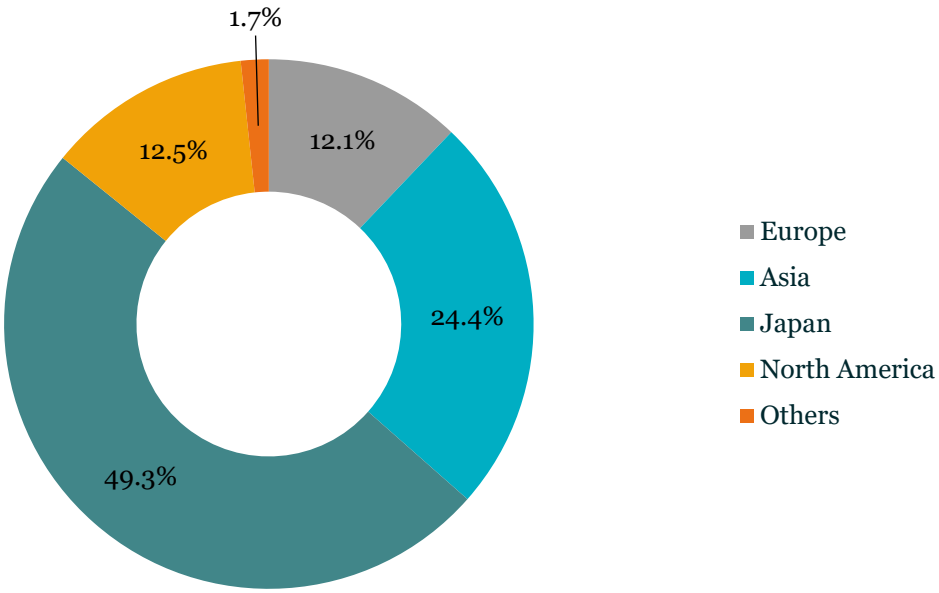
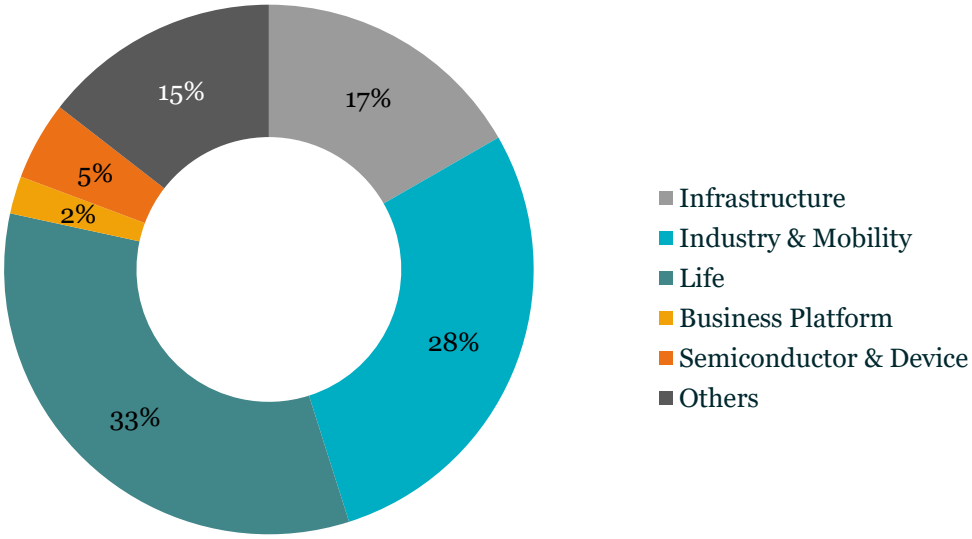


Figure 32: Mitsubishi Electric Revenue Share (%), by Operating Segments (2023)



Mitsubishi Electric - Market Overview

Core Solutions and Product Offerings	Electric and electronic equipment used in Energy and Electric Systems, Industrial Automation, Information and Communication Systems, Electronic Devices, and Home Appliances.
Market Segment	Infrastructure Industry & Mobility Life Business Platform Semiconductor & Device Others
Company Vertical	Industrial and manufacturing, automotive, defense and commercial space products, transportation, home, and more.
Company Highlights	• The Mitsubishi Electric Group is working towards the realization of a vibrant and sustainable society through continuous technological innovation and ceaseless creativity. • The Mitsubishi Electric Group aims to become a “Circular Digital-Engineering Company” that creates new value and contributes to solving social challenges through strong intra-group connections and knowledge sharing. • In fiscal 2023, they achieved ahead of schedule the revenue target of 5 trillion yen set as the financial target for fiscal 2026 in the Medium-term Management Plan. • Mitsubishi Electric's strengths are its customer base from years of business experience, wide-ranging public utility systems, and facilities and equipment with highly reliable operations such as building systems and FA systems.

Mitsubishi Electric Industrial Robotics – Products and Strategies

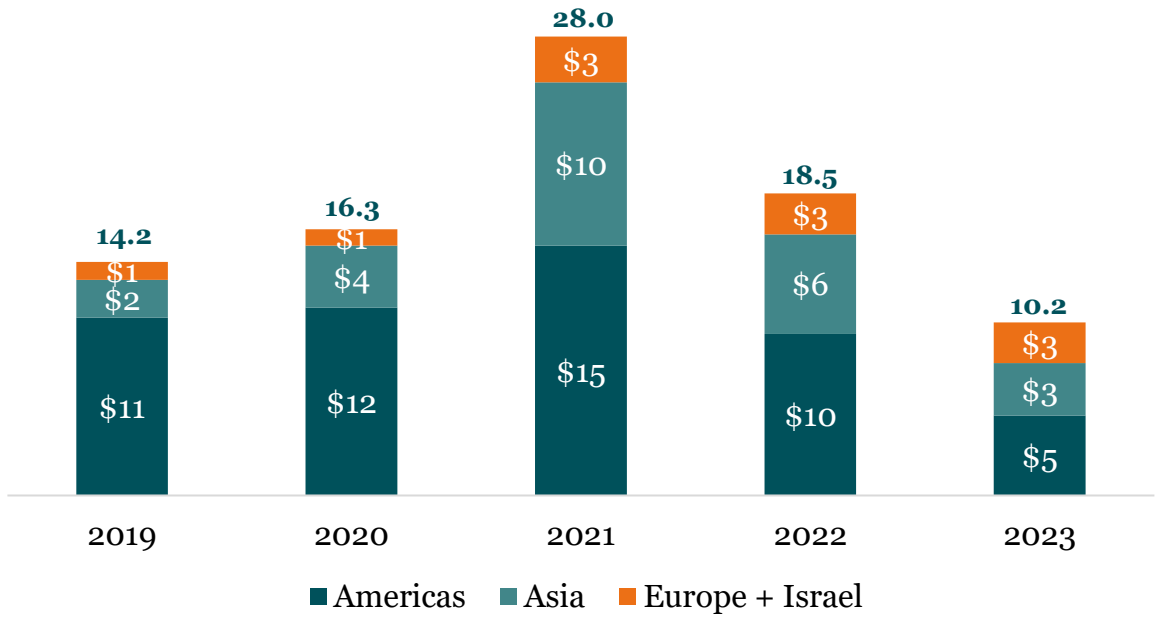
Products*	Strategies
– MELFA Smart Plus – RV-2FR – RV-20FR – RV-80FR – RV-7FRLL – RV-8CRL – RV-12CRL – FR Series Robot Safety solutions – R86TB (High-performance teaching box) – 3D vision sensor	• Emphasizing Mitsubishi Electric's commitment to technological advancement and innovation in industrial robotics. • Highlighting the precision, reliability, and cutting-edge technology of Mitsubishi Electric's robotic solutions, showcasing their application in various industrial sectors. • Positioning Mitsubishi Electric as a provider of comprehensive, integrated automation solutions that enhance operational efficiency and productivity. • Communicating the benefits of Mitsubishi Electric's robots as versatile, scalable solutions for diverse manufacturing needs. • Emphasizing Mitsubishi Electric's commitment to exceptional customer support and service in all communications. • Highlighting Mitsubishi Electric's commitment to sustainability and how its robotic solutions contribute to greener manufacturing processes. • Sharing case studies and data demonstrating the environmental benefits of using Mitsubishi Electric's robots. • Using awards and recognition in marketing materials to enhance Mitsubishi Electric's reputation as a leader in the industry.

*Note: The product list is not exhaustive.

6. ROBOTICS MERGERS AND ACQUISITIONS

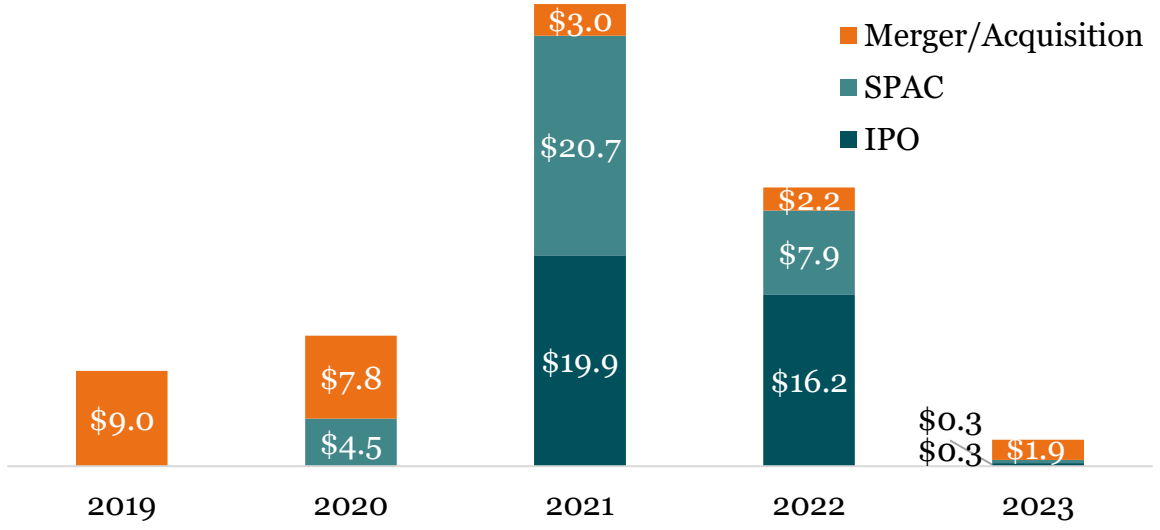
6.1 M&A in Robotics Transaction Trend Overview

Figure 33: Investment in Robotics (Quarterly) By Geography (US$ Billion)



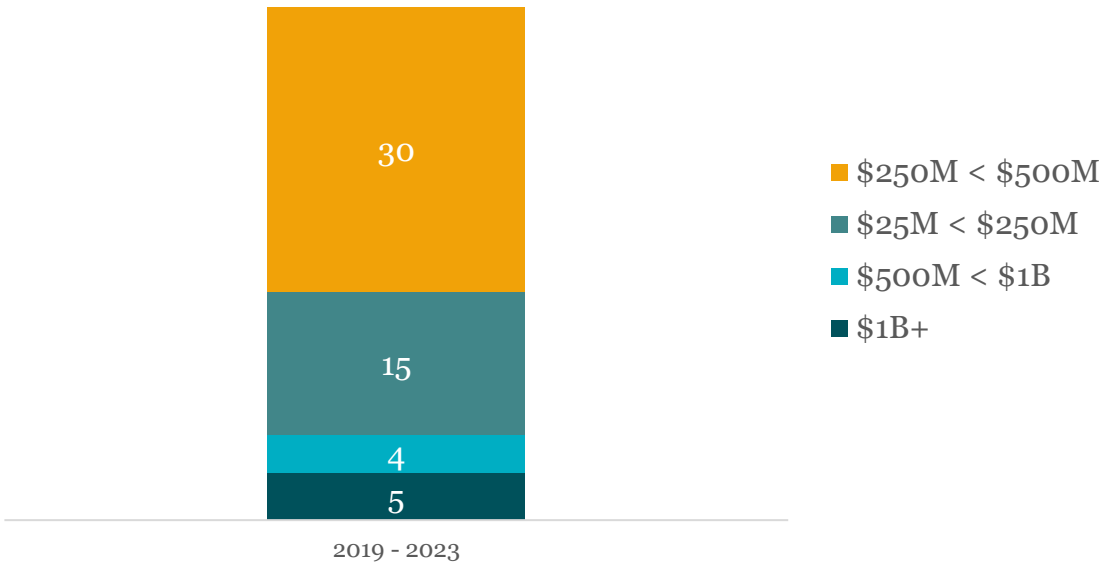
Source: PitchBook, F-Prime team analysis[36]

Figure 34: Exits in Robotics (Annual) by Valuation (US$ Billion)



Source: *PitchBook, F-Prime team analysis*[37]

Figure 35: M&A in Robotics (Annual) by Count



Source: *PitchBook, F-Prime team analysis*[38]

6.2 Merger And Acquisition (2023 – Q2 2024)

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
June 2024	Joby	Xwing	-	Acquisition	Joby Aviation has recently acquired the autonomy division of X-Wing, a division that has an extensive partnership with the U.S. Army and Air Force in service of increasing crewless flight opportunities.
May 2024	Hitachi Ltd.	MA Micro Automation	€71.5m	Acquisition	Hitachi acquires all shares of MA micro automation GmbH, a St. Leon-Rot, Germany-based leader in the field of automation technology and development of special machines. With this acquisition, Hitachi aims to further enhance its ability to provide a "Total Seamless Solution" to connect manufacturers' factory floors digitally with their front office data, allowing them to achieve total optimization and bringing Industry 4.0 to life.
April 2024	Coesia	Automation & Modular Components, LLC	-	Acquisition	Coesia, via its company FlexLink, has acquired 100% of the share capital of Automation & Modular Components. AMC will strengthen Coesia's and FlexLink's presence on the U.S. market, especially in the Battery sector, where a combined assembly or production process needs heavy

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					weight and small weight material handling applications.
April 2024	HowToRobot	Gain & Co.,	-	Merger	HowToRobot.com ApS, a provider of a global automation market platform, and Gain & Co., a robotics and automation advisor, announced a merger. The newly formed company has also received an investment from Sagitta Ventures, which will be taking a seat on its board.
April 2024	Kiwibot	AUTO Mobility Solutions	-	Acquisition	Kiwibot and AUTO Mobility Solutions say that this move will advance data protection and robotic services globally. Kiwibot claimed that it is a market leader in robotic deliveries on U.S. college campuses.
Mar 2024	Titan Medical	Conavi Medical	$69.8 m	Merger	The companies aim to combine in an all-stock transaction, focusing on commercializing Conavi's Novasight Hybrid system. Conavi designed Novasight Hybrid to guide common minimally invasive coronary procedures.
Feb 2024	-	Acieta	-	Acquisition	Acieta has installed more than 5,500 robots since it was founded in 1983. The acquisition of Acieta expands the business' equipment tending,

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					welding, and palletizing capabilities across a broader set of end markets including agriculture, foundry and die, welding and fabrication, and construction and building products.
Jan 2024	Edwin James Group	Automated Control Solutions Holdings Limited	-	Acquisition	Edwin James Group has acquired Burton-based control systems integration services provider Automated Control Solutions Holdings Limited, as well as its subsidiaries Automated Control Solutions Limited and ACS Electrical Engineering Limited. The deal is intended to expand Edwin James Group's digitalization offering and improve its systems integration and operational technology (OT) automation capacity.
Dec 2023	LIG Nex1	Ghost Robotics	$240M	Acquisition	LIG Nex1 and a partner have offered to acquire 60% of industrial and defense supplier Ghost Robotics, which develops quadruped robots for the U.S. military and its allies, as well as industrial customers, and is valued at $400 million
Dec 2023	Renovotec	Skywire	-	Acquisition	Renovotec, which provides end-to-end technology solutions for

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					supply chain and retail, has acquired a majority stake in Skywire Australia and New Zealand (Skywire).
Dec 2023	Bondada Engineering	Atpole Technologies	$0.26m	Acquisition	Consequent to the acquisition, ATPOLE has become a subsidiary company of the Bondada Engineering. ATPOLE is a leading manufacturer of advanced torque motors and controllers for EV two and three-wheelers, drones, defence and industrial application motors, which will help the company in its foray into the renewable energy space.
Nov 2023	DiDi Autonomous Driving	Benewake Beijing	$14m	Acquisition	DiDi Autonomous Driving announced an investment in Benewake (Beijing) to bolster the latter's development and mass application of robust perception LiDAR.
Nov 2023	Jiangsu DINGS Intelligent Control Technology	Suzhou Maita Intelligent Technology	$1m	Acquisition	Jiangsu DINGS Intelligent Control Technology (Dingzhi Technology) to Acquire 10% Stake in Suzhou Maita Intelligent Technology.
Nov 2023	Agile Robots	Franka Emika	$32M	Acquisition	Agile Robots AG, a German robotics developer, is acquiring Franka Emika, which offers an industrial robot arm, a cobot arm, software,

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					an anthropomorphic robotic hand and more.
Oct 2023	Emerson	National Instruments	$8.2bn	Acquisition	Global technology and software company Emerson has announced it has closed its acquisition of National Instruments (NI), a provider of software-connected automated test and measurement systems. The acquisition of NI is expected to advance Emerson's position as a global automation player and expands its opportunity to capitalise on key secular trends such as nearshoring, digital transformation, sustainability and decarbonisation.
Oct 2023	Electric Sheep	Phoenix Landscape	-	Acquisition	Electric Sheep, which provides AI mowing robots, has acquired two landscaping firms as part of its outdoor service expansion strategy.
Sep 2023	Rockwell Automation	Clearpath Robotics	$600M	Acquisition	Rockwell Automation is acquiring Clearpath Robotics, an Ontario, Canada-based developer of autonomous mobile robots (AMRs) for research and development purposes.
Sep 2023	Tquila Automation	Element Blue	$20m	Acquisition	Intelligent automation consultancy Tquila Automation has

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					announced its acquisition of Element Blue, an intelligent automation company in the US healthcare market.
Aug 2023	AeroVironment	Tomahawk Robotics	$120M	Acquisition	AeroVironment, Inc announced to acquire Tomahawk Robotics, a developer of AI-enabled robotic control systems for the military. It will acquire 100% of the company's equity.
Aug 2023	Jungheinrich	Magazino	-	Acquisition	Jungheinrich, a Hamburg-based intralogistics company, has acquired all shares of the robotics company Magazino. The robotics company will now have access to the Group's global sales and service network.
July 2023	Applied Intuition	Embark Technology	$73.5	Acquisition	Embark Trucks, the autonomous trucking company has been acquired by Applied Intuition, a simulation and software provider for autonomous vehicle development.
June 2023	Softbank	Balyo	$13M	Acquisition	SoftBank Group has acquired a 41.8% stake in Balyo. Balyo's portfolio of automated robotic forklift technologies complements SoftBank's existing investments in

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					the transportation and logistics industries.
May 2023	DuPont de Nemours	Spectrum Plastics Group	$1750m	Acquisition	DuPont completed the previously announced acquisition of Spectrum Plastics Group, a recognized leader in specialty medical devices and components markets. With a global workforce of approximately 2,200 employees and annual revenue of about $500 million, Spectrum became part of the Industrial Solutions line of business within the Electronics & Industrial segment.
May 2023	Ocado	6 River Systems	$12.7M	Acquisition	Ocado Group has acquired 6 River Systems from Shopify. 6 River Systems develops the Chuck autonomous mobile robot (AMRs) for the logistics and non-grocery retail sectors.
April 2023	Alphatec	Fusion Robotics LLC - Assets of REMI Robotic Navigation System	$55m	Asset Transaction	Alphatec acquired all assets related to the REMI robotic navigation system from Fusion Robotics. REMI is a robotic-enabled minimally invasive system that integrates navigation and robotics into spine procedures.
April 2023	VettaFi	ROBO Global suite	-	Acquisition	VettaFi, a data and analytics firm serving asset managers and investors, said its acquisition of the ROBO

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
					Global suite will bring its indexing portfolio to more than $17 billion.
Mar2023	John Deere	SparkAI	-	Acquisition	John Deere acquired SparkAI, a New York-based startup that develops human-in-the-loop technology to help robots resolve edge cases in real time.
Mar 2023	Piab Group	COVAL	-	Acquisition	Piab, which provides robotic grippers, is adding COVAL's vacuum automation systems and IB Verfahrens- und Anlagentechnik's bulk materials conveyance to its offerings.
Mar 2023	Berkshire Grey	Softbank	$375 million	Merger	SoftBank is a strategic investment holding company with investments in AI, smart robotics, IoT, telecommunications, internet services, and clean energy technology providers while Berkshire Grey produces ecommerce fulfillment automation systems
Mar 2023	Airobotics	Iron Drone	-	Acquisition	Airobotics completed its acquisition of Iron Drone's assets and signed a memorandum of understanding with the Dubai Police to deploy counter-drone security systems.

Deal Date	Acquirer/ Investor	Target	Deal Value	Deal Type	Description
Feb 2023	Globus Medical	NuVasive	$3.1B	Merger	Musculoskeletal solutions company Globus Medical concluded the previously announced merger with spine technology company NuVasive. The merger of Globus Medical and NuVasive unites their extensive spine and orthopaedic portfolios.
Jan 2023	Built Robotics	Roin Technologies	-	Acquisition	Built Robotics has acquired Roin Technologies. Roin is a three-year-old engineering company that has designed and built several robotic concrete finishing solutions, including a shotcrete robot and a concrete trowling robot.
Jan 2023	Barcoding	FRED Automation	-	Acquisition	Barcoding, a provider of supply chain automation, has offered FRED Automation's FRED and Freddie mobile robots to help facilities with both simple and complex materials movement.

7. APPENDICES

7.1 Methodology

Our data are drawn from financial reports, published experts' interviews, secondary research reports, marketing, and other publicly available information, such as company websites and press releases. Our cut-off date for publication was June 12, 2024.

The report also expresses analysts' points of view on topics affecting the manufacturing robotics industry, developed through robust analysis of the market. The results are reported in US dollars except where specified.

Throughout the process, stringent quality assurance measures are implemented to uphold data accuracy and reliability. Ethical guidelines are strictly adhered to, maintaining integrity, confidentiality, and transparency throughout the research endeavor.

8. ENDNOTE

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Our founder is a 30-year veteran in business who has been named to **“The Most Influential Women in Mid-Market M&A by Mergers & Acquisitions Magazine”.**

ABOUT Accelerated Manufacturing Brokers, Inc.

Accelerated Manufacturing Brokers, Inc. specializes in the sale of lower middle-market manufacturing companies throughout the United States. We help manufacturers get to the next phase of life. Sometimes, that's retirement, and sometimes, it's getting to the next level of growth.

Our mission is to help save U.S. manufacturing by transitioning ownership to the next generation of entrepreneurs. In addition to selling mature manufacturing companies, we've helped owners who have developed new, industry-disruptive technologies to partner with like-minded companies to facilitate sustained growth and commercialization of the new technologies.

Accelerated Manufacturing Brokers, Inc. works in the following manufacturing sectors:

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- CNC Components
- Defense
- Electronics
- Fabricated Metal Products
- Farming Equipment
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- Measuring Devices
- Metal Finishing
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- Pump & Valve
- Robotics
- Semiconductor
- Screw Machine Products
- Small Arms
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