

Doosan Robotics

Innovation in every motion,
revolutionizing the way we work

DOOSAN



Disclaimer

This presentation (together with oral statements made in connection herewith, the “Presentation”) is for informational purposes only with respect to Doosan Robotics Inc. (the “Company”) and nothing in this Presentation should be construed as either an offer to sell or a solicitation of an offer to buy or sell any securities. This Presentation does not purport to contain all the information that a prospective investor may require in connection with any potential investment in the Company. You should not treat the contents of this Presentation, or any information provided in connection with it, as financial advice, financial product advice or advice relating to legal, taxation or investment matters and should consult with your own counsel and tax and financial advisors as to legal and related matters concerning the matters described herein. By accepting this Presentation, you confirm that you are not relying solely upon the Presentation to make any investment decision.

This Presentation is provided expressly on the basis that you will carry out your own independent inquiries into the matters contained in the Presentation and make your own independent decisions about the affairs, financial position or prospects of the Company. No representation or warranty (whether express or implied) is made by the Company or any of its officers, advisers, agents or employees as to the accuracy, completeness or reasonableness of the information including, but not limited to, certain data obtained from various external data sources, statements, opinions or matters (express or implied) arising out of, contained in or derived from this Presentation or provided in connection with it, or any omission from this Presentation, nor as to the attainability of any estimates, forecasts or projections set out in this Presentation. Furthermore, the Presentation contains forwardlooking statements which are based upon current beliefs and expectations of the Company and its management. These forward-looking statements are based on a number of assumptions about the future and are subject to known and unknown risks and uncertainties, some of which are beyond the Company’s control. Actual results, events and performance may differ materially from those contemplated by the relevant forwardlooking statements. The Company does not undertake any obligation to update any forwardlooking statement to reflect events that occur or circumstances that arise after the date of this Presentation. Neither the Company, nor its related bodies corporate, officers, their advisers, agents and employees accept any responsibility or liability to you or to any other person or entity arising out of this Presentation including pursuant to the general law (whether for negligence, under statute or otherwise). Any such responsibility or liability is, to the maximum extent permitted by law, expressly disclaimed and excluded.

The Company reserves the right to update, amend or supplement this Presentation at any time in its absolute discretion (without incurring any obligation to do so). All contents, including trademarks, services marks, and trade names, in this Presentation are the Company’s proprietary property and no part of this Presentation may be reproduced, distributed, or transmitted in any form or by any means without the prior written consent of the Company.

You are also being advised that the United States securities laws restrict persons with material nonpublic information about a company obtained directly or indirectly from that company from purchasing or selling securities of such company, or from communicating such information to any other person under circumstances in which it is reasonably foreseeable that such person is likely to purchase or sell such securities on the basis of such information. The Company represents and warrants that the information contained in this Presentation is either publicly available information or not material information (although it may be sensitive and proprietary) with respect to the Company for purposes of United States federal and state securities laws.



Chapter 01

Who we are











- 01. Main business areas
- 02. Structural change in labor market
- 03. Cobot optimized for targeting potential market
- 04. Most rapidly growing robotics company



Main business areas

Expansion into solution packaged products and SW platform backed by best-in-class quality of Cobot

DR's business areas

Main Business Area Cobot	Key Strategic Focus Solution	Future Growth Driver Software
 <p>Series E</p> <p>Higher accessibility to the F&B market with lower price</p>	 <p>Coffee Module</p> <p>Unmanned café solution</p>	 <p>Dart-Suite</p>
 <p>Series A</p> <p>A low payload⁽¹⁾ model of 5~9kg without torque sensor</p>	 <p>Palletizing Solution</p>	<p>Dart IDE</p> <p>Tool kit for developing robot apps</p>
 <p>Series M</p> <p>A premium model capable of precise work based on torque sensors</p>	 <p>Frying solution</p>	<p>Dart Platform</p> <p>Primary platform where apps are downloaded and run</p>
 <p>Series H, P</p> <p>A high payload model of 20~25kg, 30kg</p>	 <p>Ice-cream robot</p>  <p>Welding solution</p>	<p>Dart Store</p> <p>A store offering a variety of robot apps</p>

(1) Payload: The maximum weight that robot can lift and carry

Structural change in labor market

Working-age population is expected to decline rapidly mainly in developed countries while the avoidance of labor intensifies due to changed paradigm

Intensifying labor shortage

Falling labor force population



Drop in working-age population due to the aging and shrinking birth rate

Reduction in labor elasticity



Post COVID-19, needs for stable labor force has increased

High labor cost



Mounting burden of labor cost as average income level grows

Desire for high quality of life



Dangerous

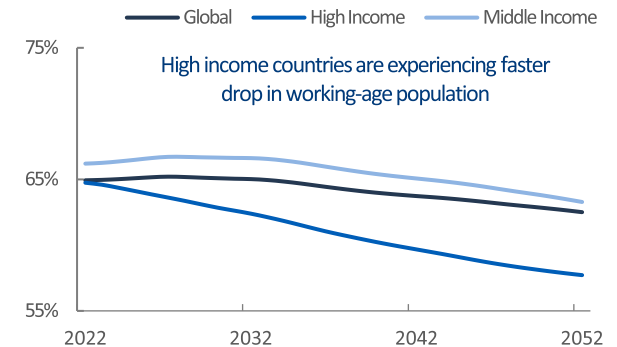
Difficult

Dirty

Repetitive

Increasing aversion to 3D / repetitive labor

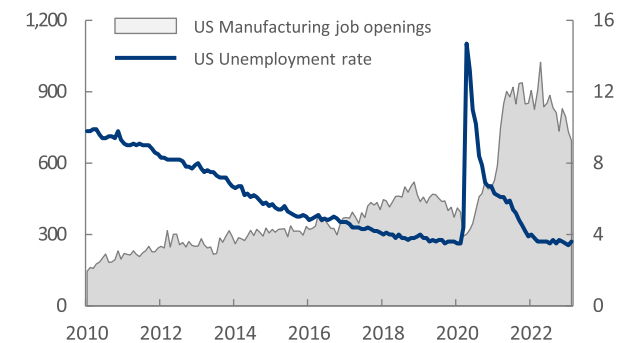
Global working-age population forecast⁽¹⁾ (age between 15 ~ 64)



Source: World Population Prospects 2022 (UN),
(1) Breakdown by income level, based on World Bank classification

U.S. Manufacturing job openings and unemployment rate trend

(10k (LHS), % (RHS))


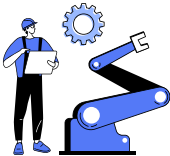
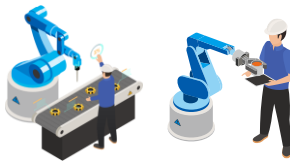

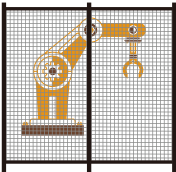


Source: U.S. Bureau of labor statistics

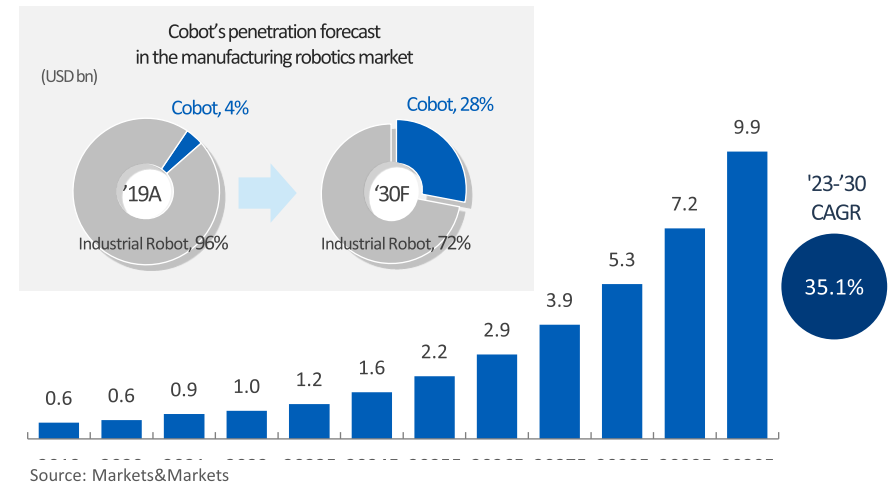
Cobot optimized for targeting potential market

Robust growth of cobot market is expected with a replacement of human labor and Cobot is expected to vastly penetrate to wider markets including professional and personal service market

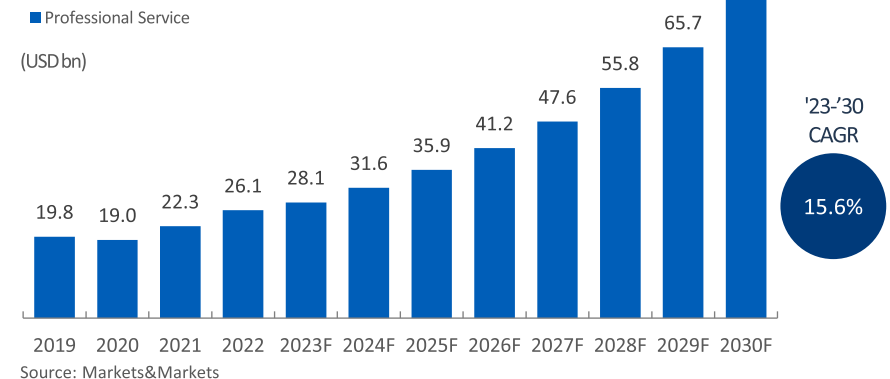
Why Cobot?

	Feature	Industrial	Professional Service	Personal Service
Cobots 	Safety	 Interaction with human / Low initial cost	High Expandability  Combination with mobility and vision / Diverse applications	
	Light weight			
	Easy control			
Industrial Robots 	High Danger	 Low expandability due to inability to interact with human		
	Fence needed			
	Heavy weight			

Cobot market outlook



Service robot market outlook⁽¹⁾



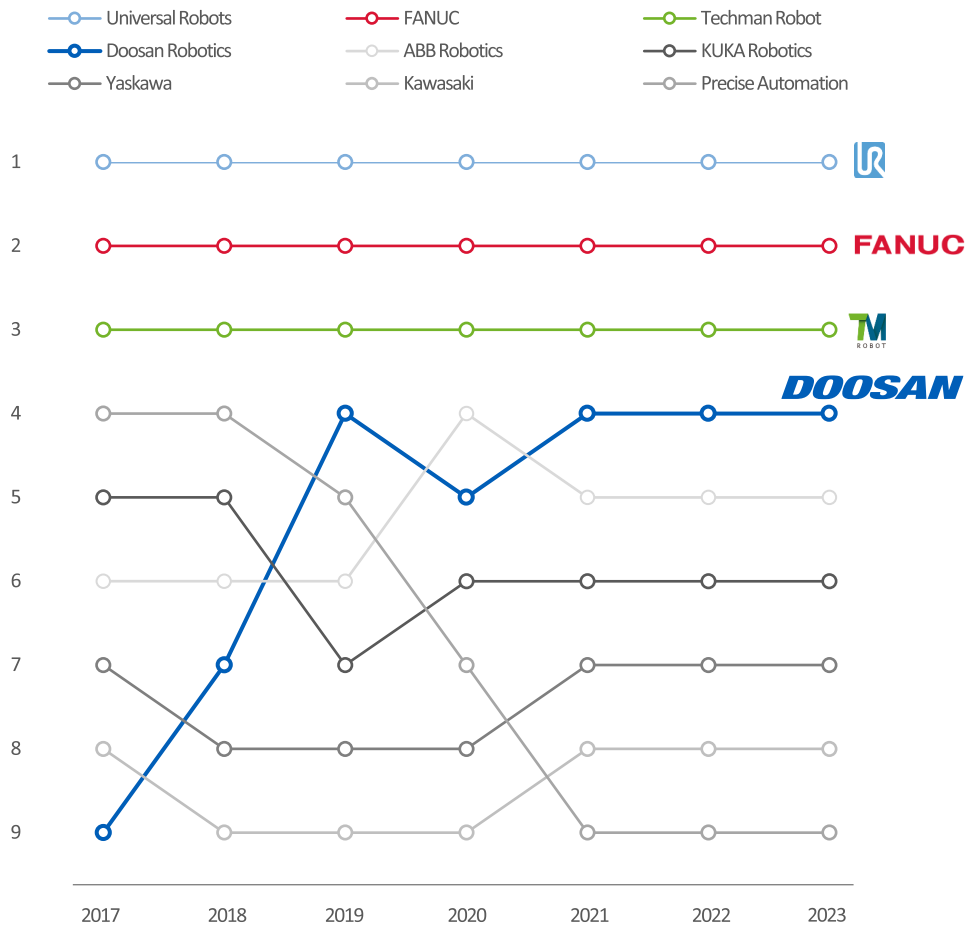
(1) Professional service robots are robots used for commercial purposes, and do not include personnel robots (i.e. robot vacuum cleaners, drones, etc.) used by individuals for non-commercial purposes.

Most rapidly growing global leading robotics company

DOOSAN

Fastest growth among the global leading robotics peers since its product launch in 2018

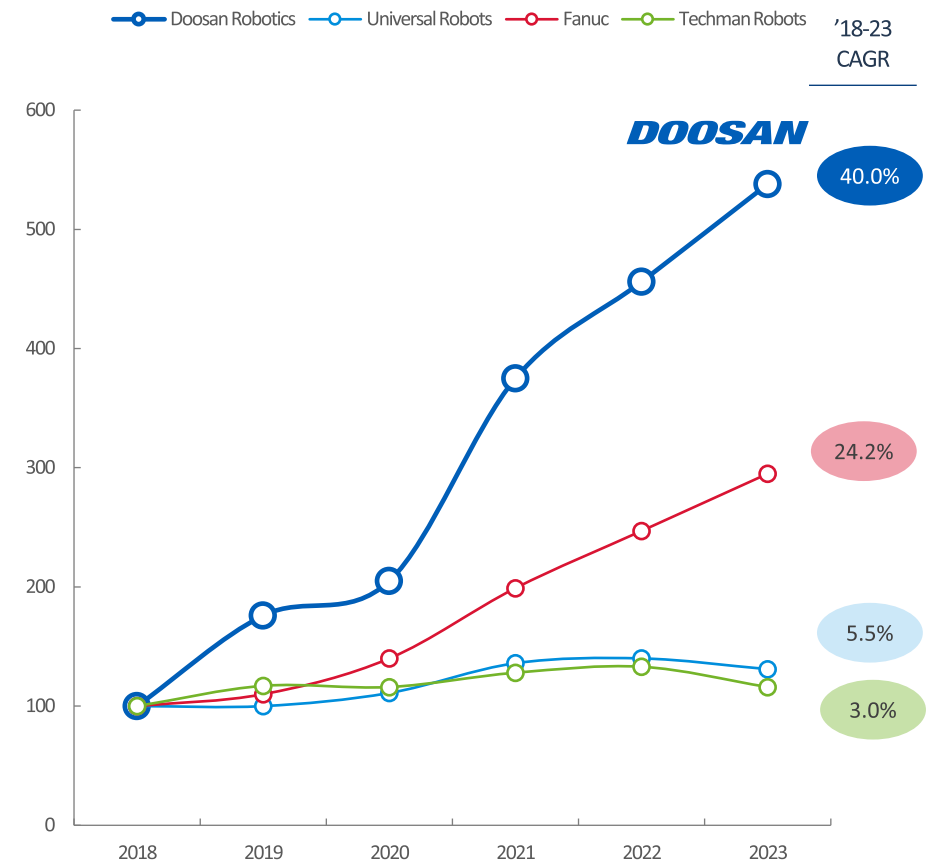
Cobot market share ranking (excl. China market)



Source: Company data, Markets & Markets

Major cobot makers' revenue growth trends

(2018 Revenue =100)



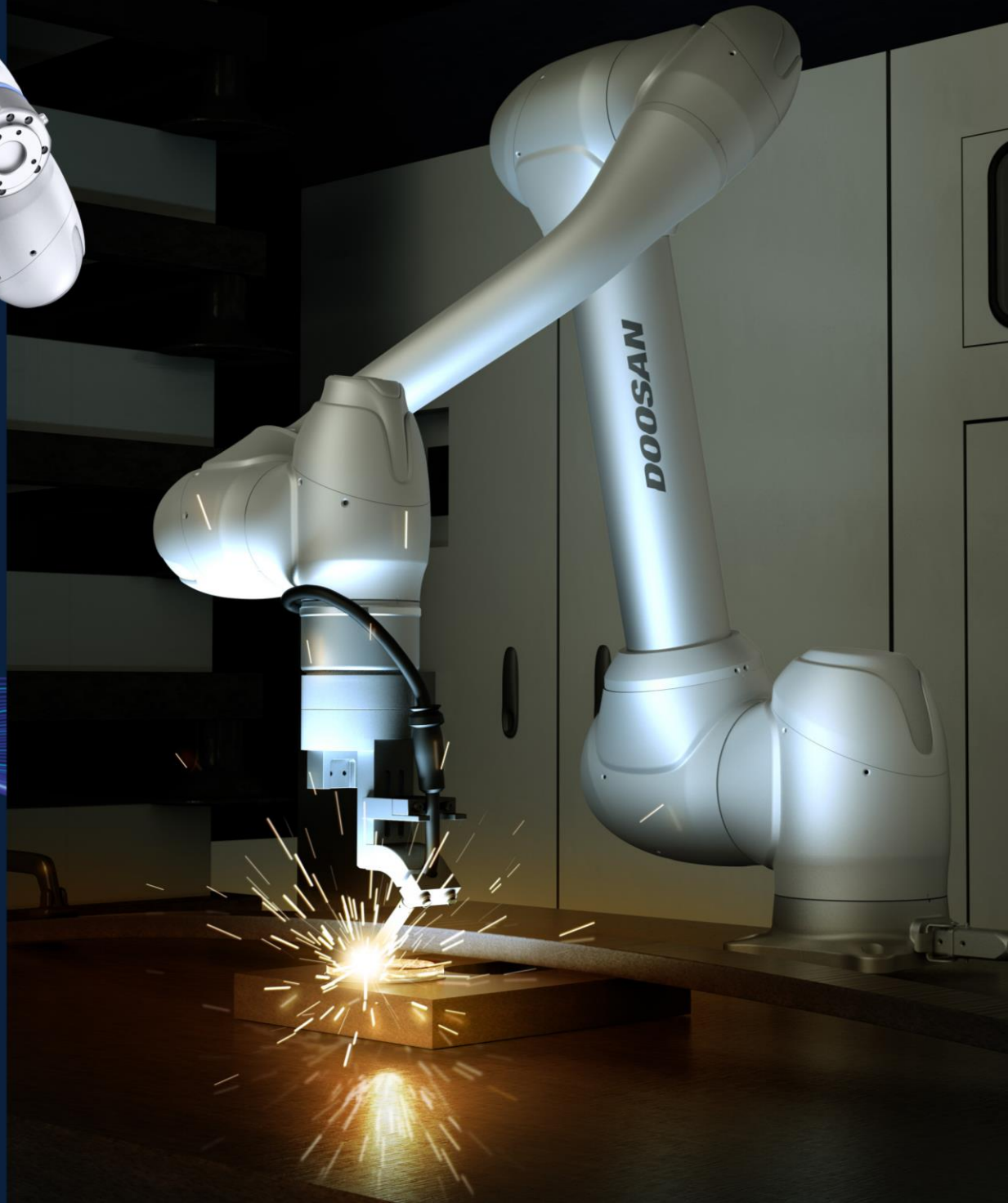
Source: Company data, Markets & Markets



Chapter 02

What Makes us Special?

- 01. Leading Technology
- 02. Global Presence
- 03. New Application



DR is the leader of safety qualification

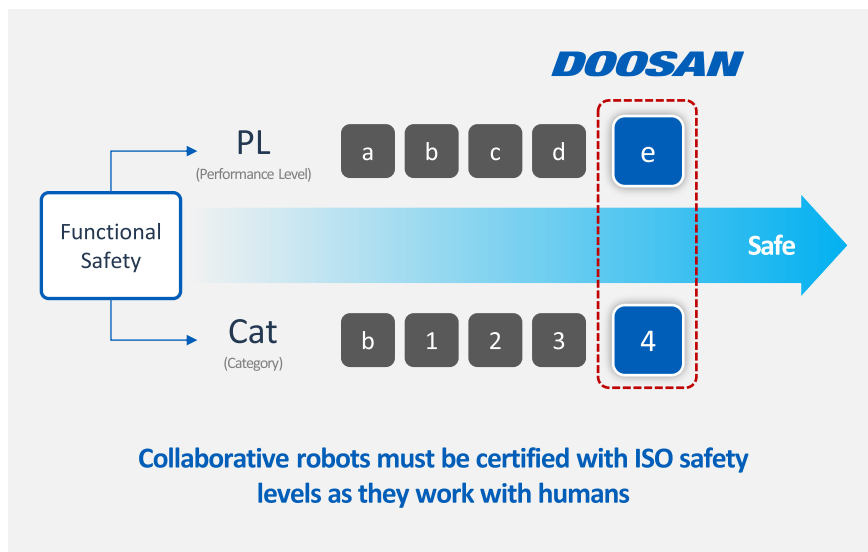
DOOSAN

DR is certified with the highest safety rating among leading global cobot manufacturers

Best-class safety certificates

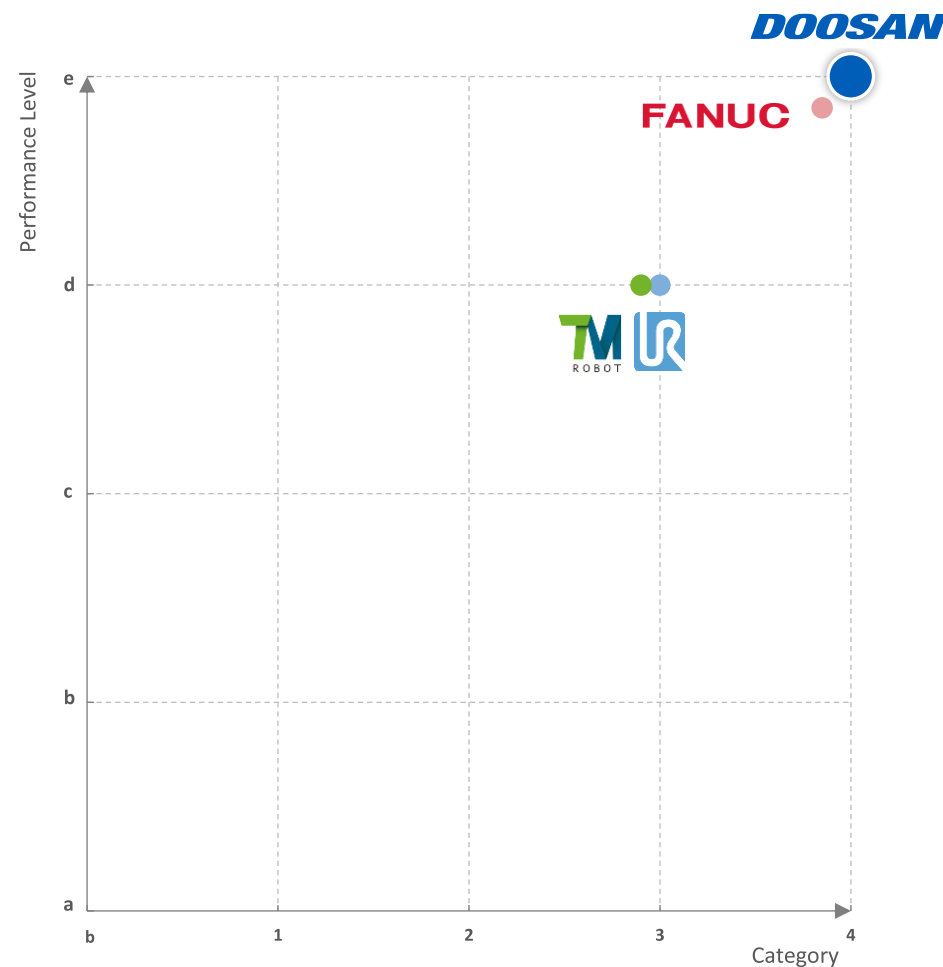
PL e, Cat 4 Certification

ISO certification overview



Source: Company data

Major cobot makers' certification status⁽¹⁾



Source: Company data
(1) Based on highest safety rating

DR is specialized in offering products with a high degree of precision





Best-in-class precision capability with top-notch software and control technology backed by 6 torque sensors⁽¹⁾

Adoption of torque sensors



Differences in operation

	 Torque sensors	 Current control
Mechanism	Directly measure the torque generated from robotics motion	Indirectly measure torque with the current value input to a motor
Operating Feature	Measure the direction of an object to enable robots to perform diverse motions	Cannot measure the direction of an object, instead perform only predetermined motions
Pros	<ul style="list-style-type: none"> Capable of doing unstructured motions such as fitting an object into a specified form Precise force control for delicate and safe motion 	Affordable Price

Torque sensor's control methods



Force Control

Generates motion until the set force and reaction force are in equilibrium



Compliance Control

Reaches equilibrium at a target point, generating reaction force when displacement occurs at the equilibrium point

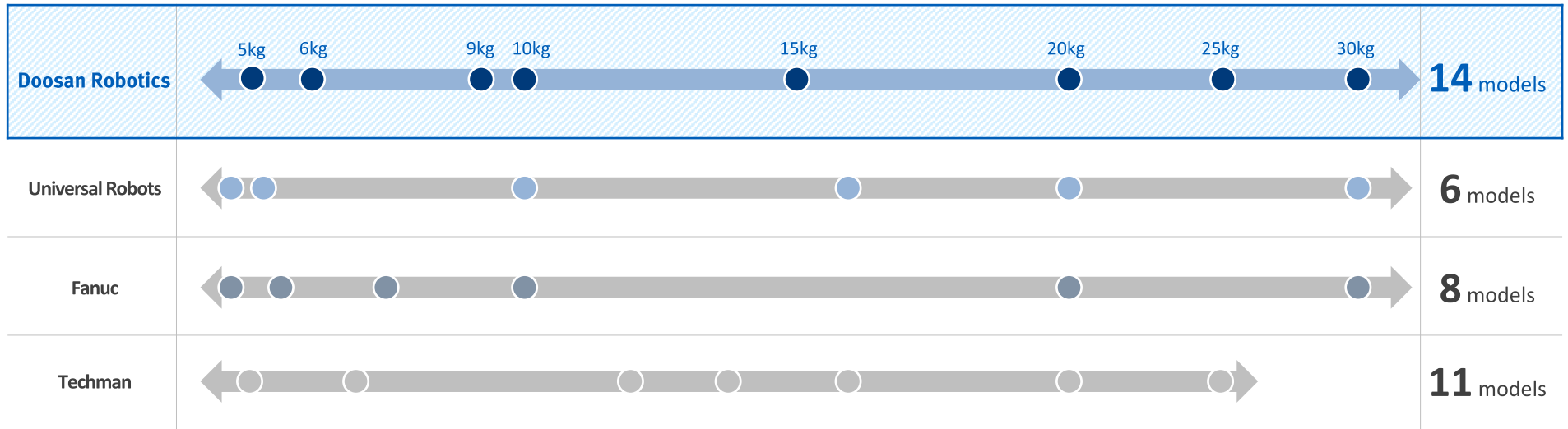


Diverse product portfolio

DOOSAN

DR has the largest product portfolio with various payloads and work ranges

Product portfolio of major cobot makers⁽¹⁾



Source: Markets&Markets

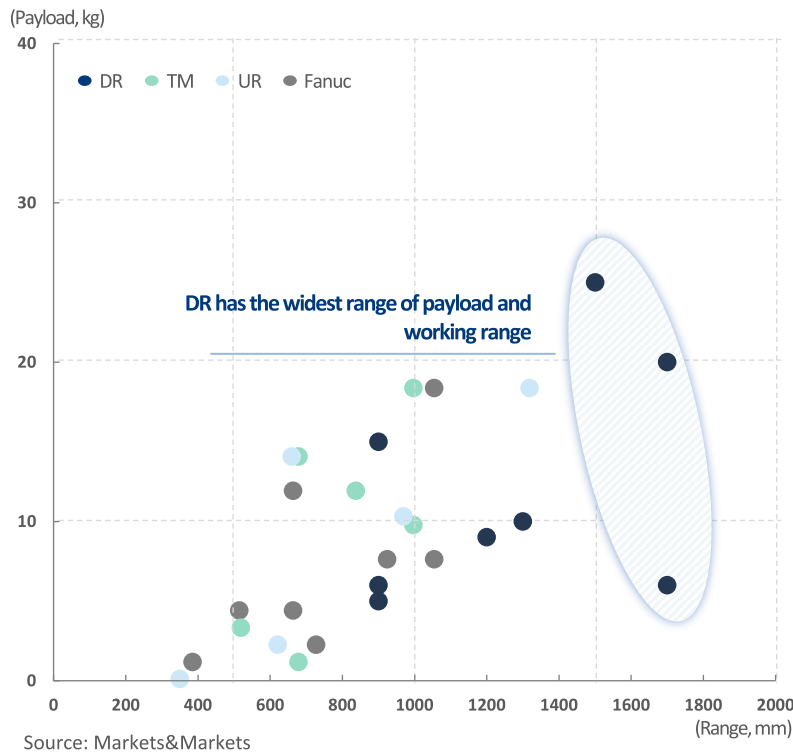
(1) Based on Markets&Markets research data excluding models that weights more than 100kg

Pioneering high payload markets



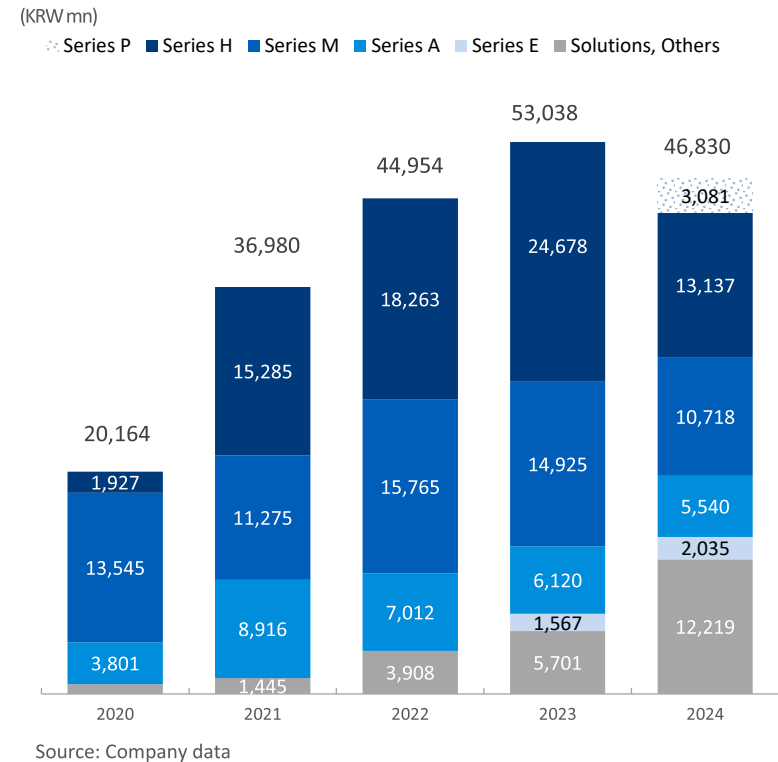
Pioneering the new markets with high payload and wide work range

Payload and work range landscape of major cobot makers⁽¹⁾



A wide range of product lineups and coverages enables diverse market applications and customizations

DR's revenue breakdown by series



Strong dominance in 20kg+ Payload Cobot market with a market share of 72.0% in 2022⁽²⁾

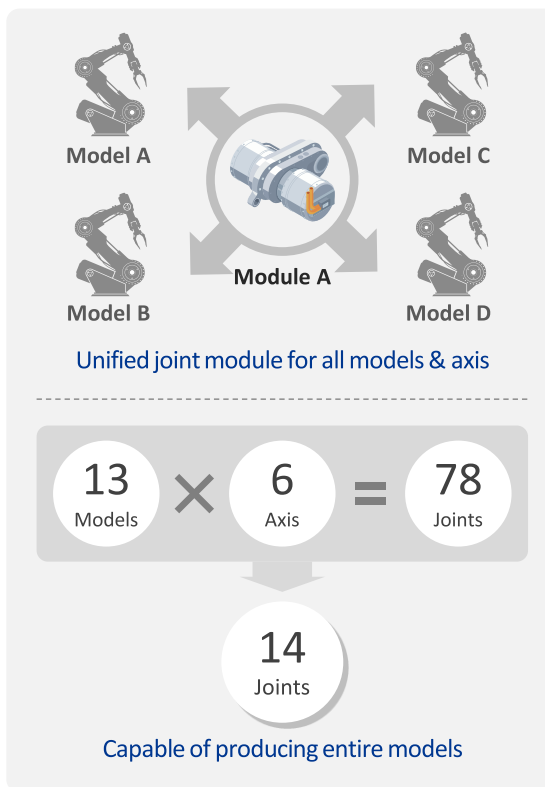
(1) Based on Markets&Markets research data excluding models that weights more than 100kg

(2) Markets&Markets

Establishment of a mass production system

Unified Joint module manufacturing offers enhanced cost structure and an opportunity to expand capacity without large-scale CAPEX

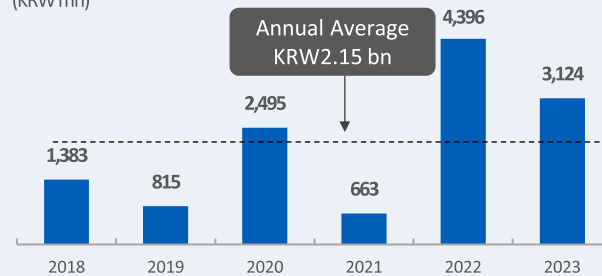
Modularized production system



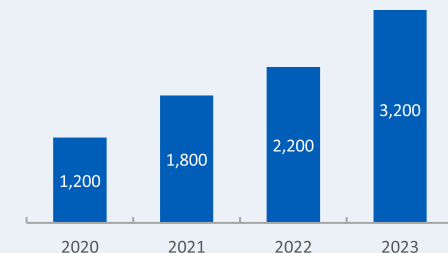
Simplified manufacturing process

Ready for mass production without large-scale CAPEX through production of unified joint module

CAPEX trend (excl. intangible asset) (KRW mn)



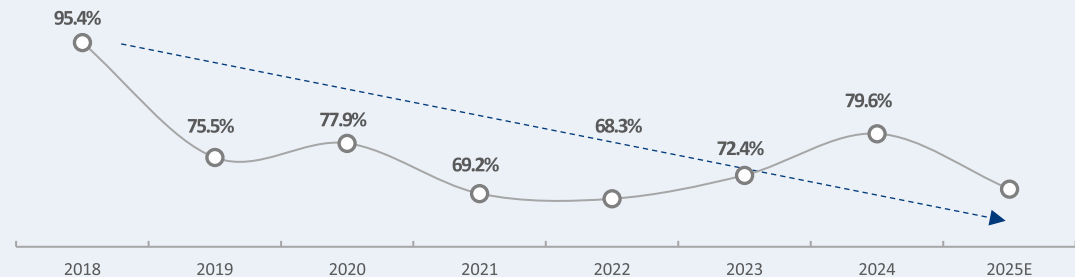
Annual capacity (Unit)



Enhanced raw material composition

Secured economies of scale and unit-cost reduction via streamlining raw materials and unified joint module design

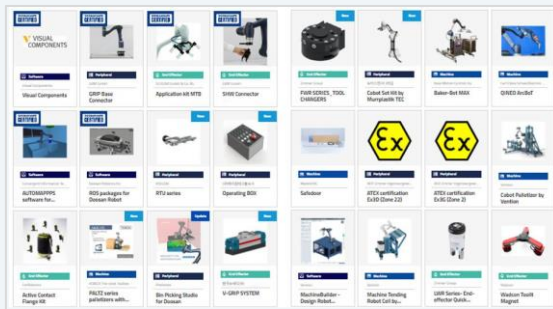
CoGs % to sales



Outstanding user convenience

DR offers easy-to-use working environment to all customers (SI & end-users) with user-friendly SW platform and UI/UX

1. Easy Connecting



Doosan Mate

Provides SW environment for easy connection between various tools(EOAT⁽¹⁾) such as Gripper

2. Easy Teaching



Cockpit Function

Able to directly pre-set simple motions without any complex programming

3. Easy Programming



Task Editor, Dart-Studio, etc.

Easy programming that does not require professional knowledge through functions such as Drag & Drop of pre-programmed application

Source: Company data

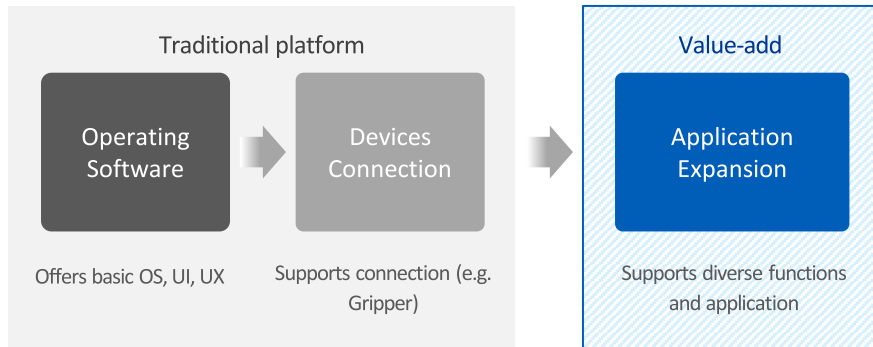
(1) End of Arm Tooling: An accessory that attaches to the end of a robot that allows the robot to perform a specific action, such as grabbing an object or tightening a screw



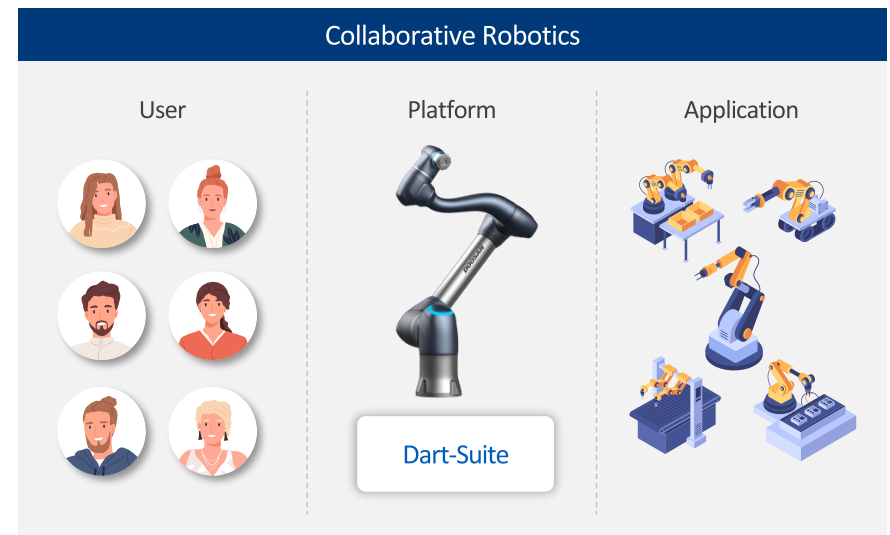
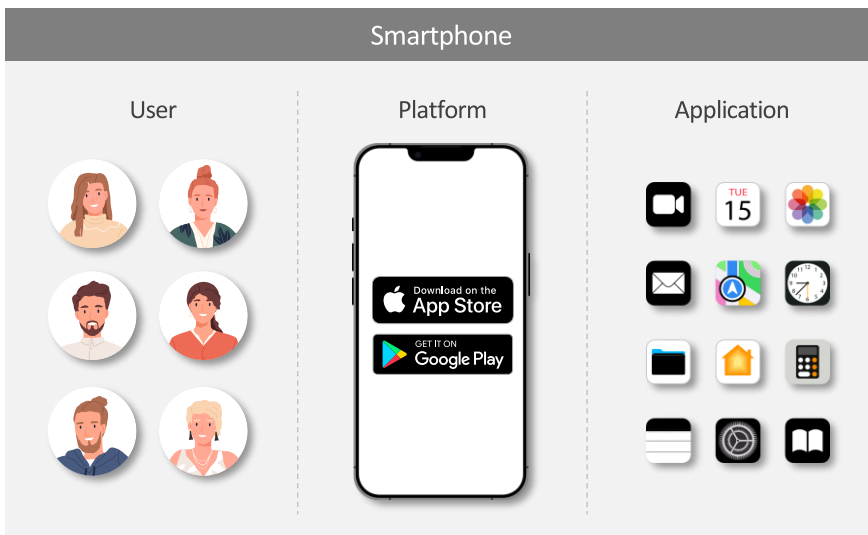
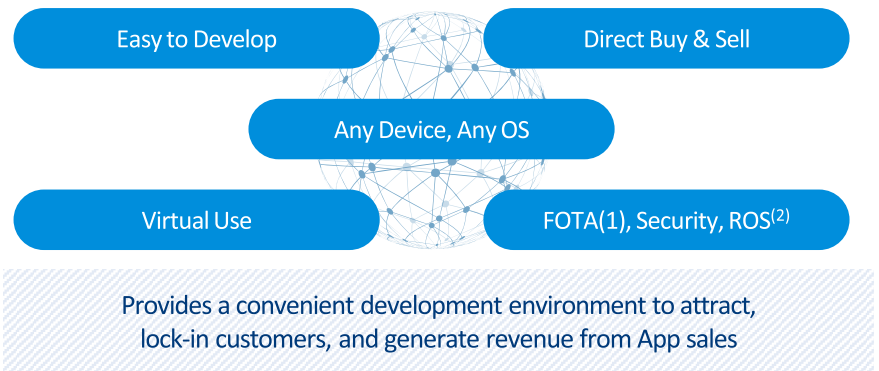
Establishment of a software platform

Dart-Suite is an integrated platform for all developers, creators, and users, providing a similar working environment to those of smartphone

What is Dart-Suite?



Dart-Suite Pros



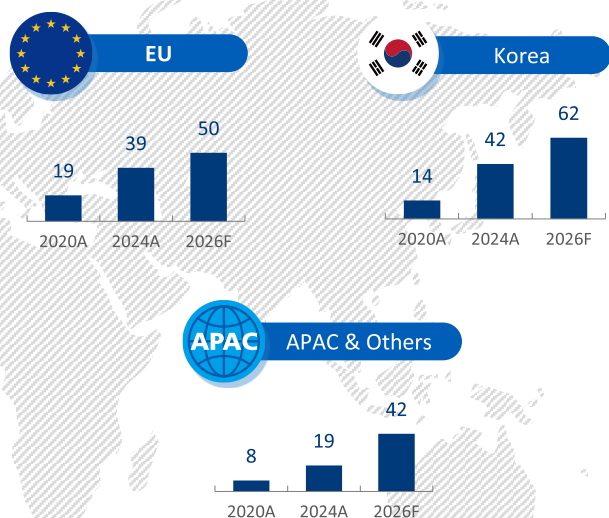
(1) FOTA(Firmware Over-The-Air): Updating Software remotely (First to developed and implemented in the robot industry)
 (2) ROS: Robot Operating System

True global player with comprehensive sales network in advanced markets

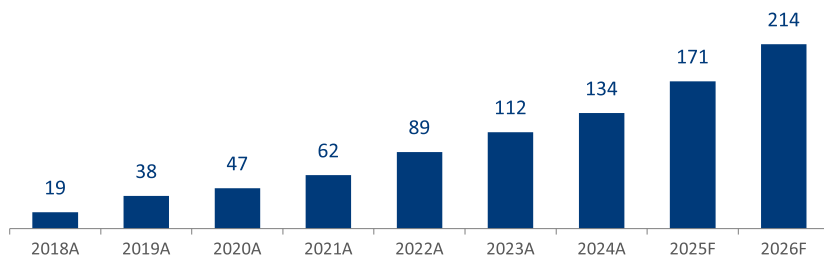
DOOSAN

DR possesses strong global presence with 100+ global sales channels, generating more than 60% of its revenue from overseas (North America, Europe, etc.)

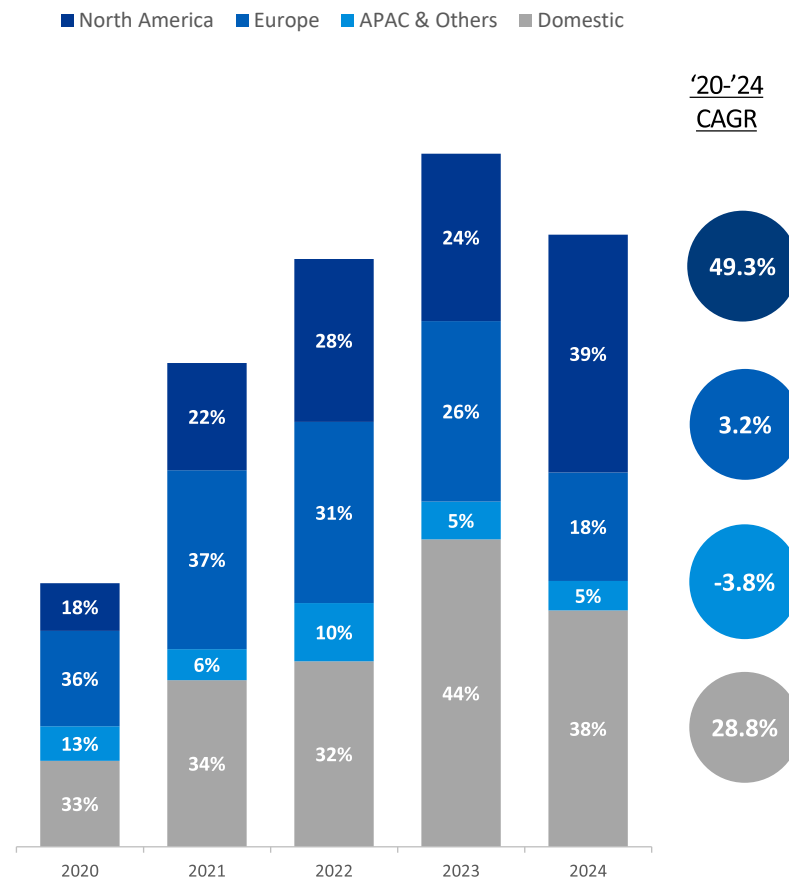
DR global sales network



DR sales channel trend



DR sales geography breakdown



Proven track record

DOOSAN

DR is a trusted partner for a well-diversified group of blue-chip customers across major industries

DR's Global Customers

Automotive	          
Electronics	      
Industrials	           
Consumer Goods	              

Expansion through global partnerships

DOOSAN

Signed MOU with global leaders from various industries to jointly develop and exclusively supply robot solutions

Global IT Company A

AI-Based
Robot Control
Solution



Rockwell Automation

Exclusive supply of
collaborative robots
in smart factories



SAMSUNG C&T

Joint development of
collaborative construction
robot solution



Global Battery Manufacturer B

Joint development of
automatic EV charging
solution



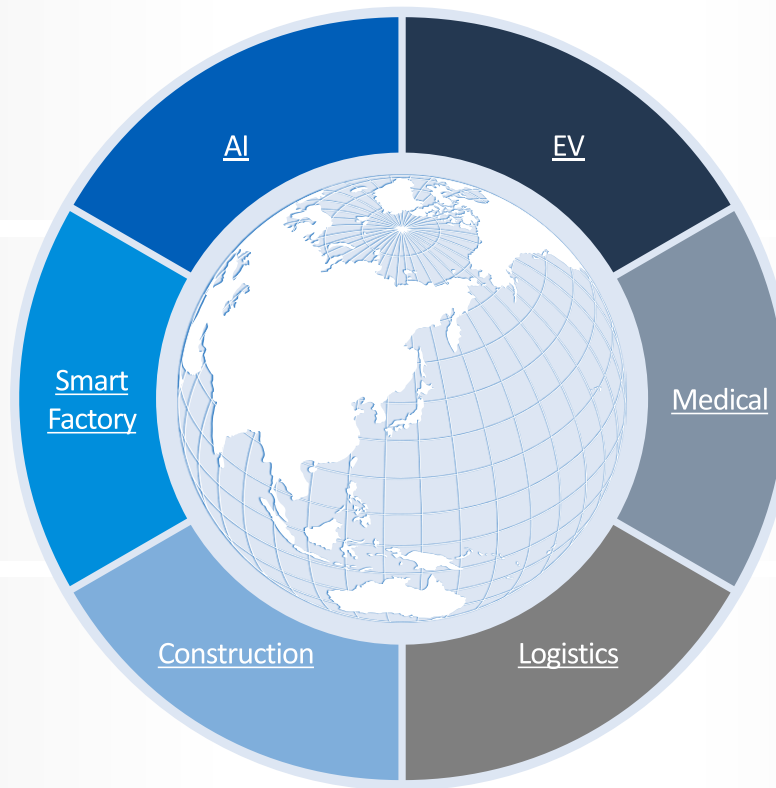
세브란스병원 SEVERANCE HOSPITAL

Joint development of
medical solutions



Cobot Lift

Joint-development of lift-
applied luggage solution




Diversified application backed by accumulated know-hows

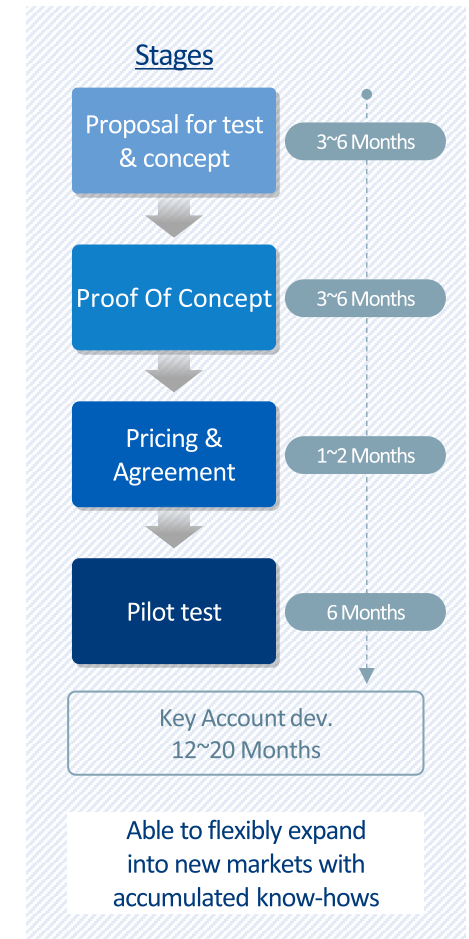
DOOSAN

Able to flexibly expand into new markets and applications with accumulated know-hows with each Key Account, which takes 12 to 20 months of development/testing

Key Account's use cases

Industrials	Automotive	Consumer Staples	Food Service
<p>Schiphol Airport, Netherlands</p> <p>Baggage Handling</p>  <ul style="list-style-type: none"> Picks up a baggage from the transport conveyor with a cobot and automatically loads it into a cart <p>Safety equipment manufacturer A</p> <p>Assembly</p>  <ul style="list-style-type: none"> Collaboration with human workers to screw parts and settle them on the conveyor 	<p>Global Top Automobile OEM</p> <p>Assembly</p>  <ul style="list-style-type: none"> Rear wheel shock absorber assembly <p>Automobile part maker B</p> <p>Gluing</p>  <ul style="list-style-type: none"> Mat gluing for automotive moldings 	<p>Coffee Manufacturer C</p> <p>Palletizing</p>  <ul style="list-style-type: none"> Product palletizing Sets speed limit tailoring to the human worker <p>Beverage Manufacturer D</p> <p>Palletizing</p>  <ul style="list-style-type: none"> Product pack palletizing 	<p>Chicken Franchise G</p> <p>Fryer</p>  <ul style="list-style-type: none"> Automated chicken fry <p>Restaurant franchise F</p> <p>Noodle Cook</p>  <ul style="list-style-type: none"> Automated noodle making

Key Account Development





Chapter 03

Our Way Forward

- 01. AI-based robot solutions model
- 02. Doosan Robotics' growth roadmap
- 03. Financial statements

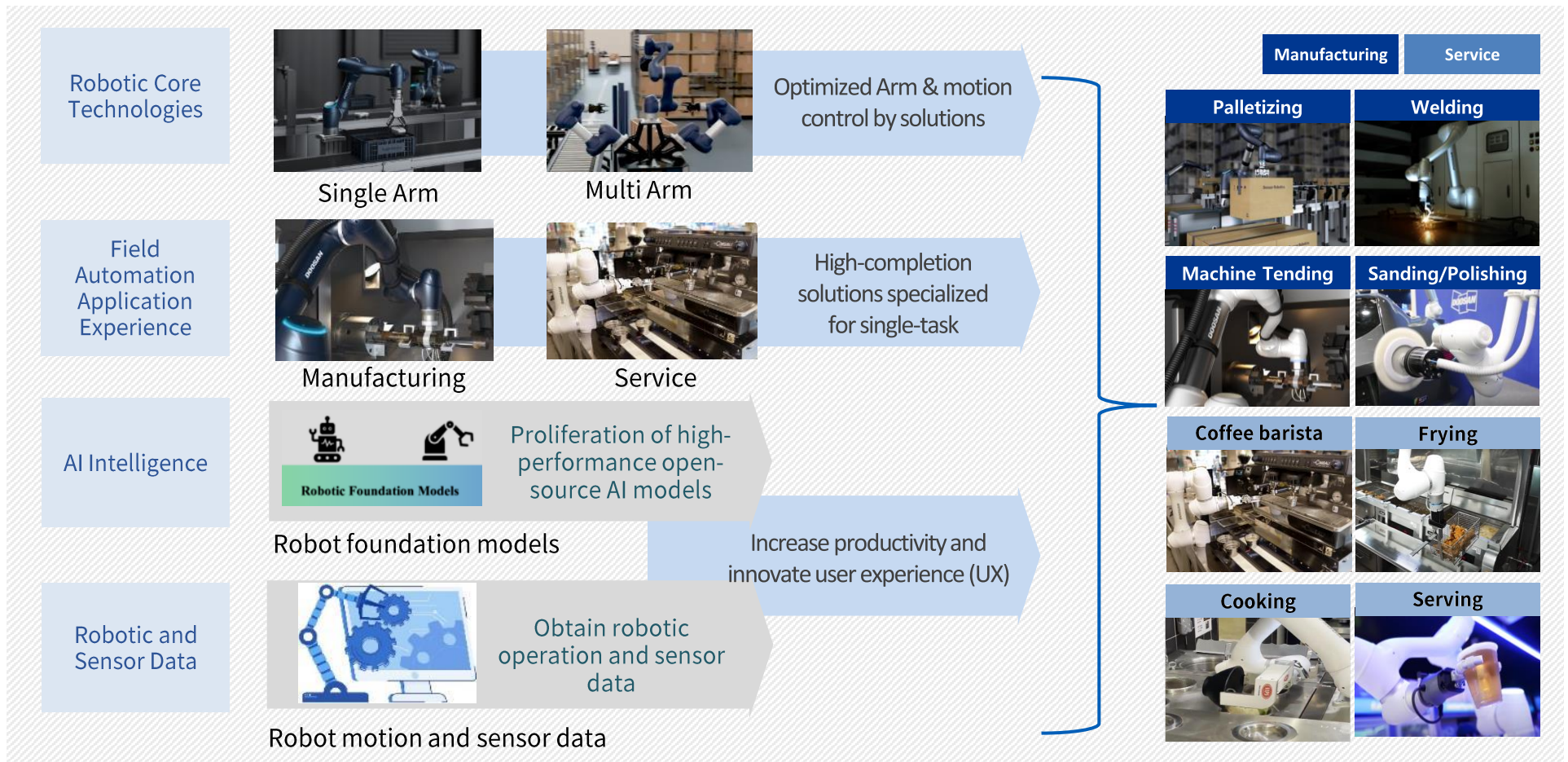


Strengthening AI-based Robot Solutions business model

Transitioning to AI robot solutions model integrated with Arm, S/W, and AI – departing from Arm-only sales

DR's AI-powered Robot Solutions

Solution application areas



Driving AI-driven innovation for Practical Humanoids

Enhancing engineering and AI capabilities for AI robot solutions through M&A, global partnerships

Step 1

Past

Cobot H/W

- Focusing development and sales on a single robot Arm

Become No.1 in Cobot

Step 2

Now & Near future

AI Robot Solution

- A Plug & Play type AI robot solutions integrating Arm + AI + SW

Become a global leader of AI-driven robot automation

Step 3

Future

The Most Practical Humanoid Robot

- Fully autonomous multi-tasking humanoid robot products with a practical design

Financial statements

Consolidated Income Statement

Unit: KRWmn

	FY2021	FY2022	FY2023	FY2024
	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited
Revenue	36,980	44,954	53,038	46,830
Cost of Goods Sold	25,598	30,710	38,378	37,300
Gross Profit	11,382	14,244	14,660	9,530
SG&A Expense	18,467	27,472	33,828	50,732
Operating Loss	(7,085)	(13,228)	(19,168)	(41,202)
Financial Income	247	819	4,389	15,439
Financial Expense	582	1,027	1,907	701
Other Non-op. Income	40	981	1,907	2,085
Other Non-op. Expense	38	93	309	11,744
EBIT	(7,417)	(12,548)	(15,874)	(36,553)
Tax expense	-	-	-	-
Net Loss	(7,417)	(12,548)	(15,874)	(36,561)

Consolidated Balance Sheet

Unit: KRWmn

	FY2021	FY2022	FY2023	FY2024
	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited
Current Asset	19,662	38,837	426,105	342,029
Cash & Cash Equivalent	4,390	7,430	305,424	265,536
Accounts Receivables	8,558	10,644	22,236	28,334
Inventory	5,615	13,391	14,154	29,307
Other Current Asset	1,099	7,372	84,291	18,852
Non-current Asset	9,783	23,782	30,317	79,662
PP&E	7,754	15,973	21,657	18,826
Other Non-current Asset	2,029	7,809	8,660	60,836
Total Asset	29,445	62,619	456,422	421,691
Current Liabilities	11,809	14,738	13,353	15,446
Accounts Payable	5,036	3,875	5,894	4,321
Short-term debts	-	-	-	-
Other Current Liabilities	6,773	10,863	7,459	11,125
Non-current Liabilities	2,135	5,116	4,261	3,743
Lease Liabilities	1,544	3,418	3,773	1,691
Other Non-current Liabilities	591	1,698	488	2,052
Total Liabilities	13,944	19,854	17,614	19,190
Common Equity	22,100	24,310	32,410	32,410
Total Equity	15,502	42,765	438,808	402,501

Source: Company data

www.doosanrobotics.com
Robotics.ir@doosan.com

Doosan Robotics

DOOSAN