

Doosan Robotics

Innovation in every motion,
revolutionizing the way we work

DOOSAN



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

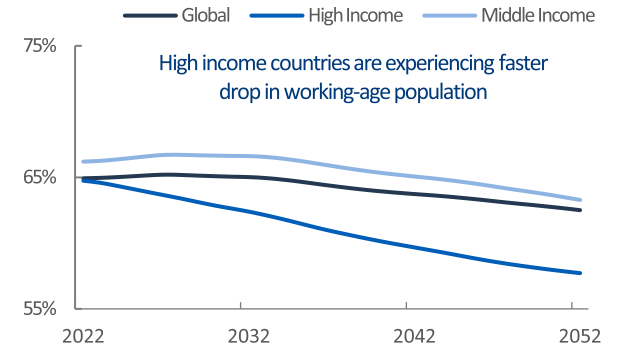
Desire for high quality of life



- Dangerous
- Difficult
- Dirty
- Repetitive

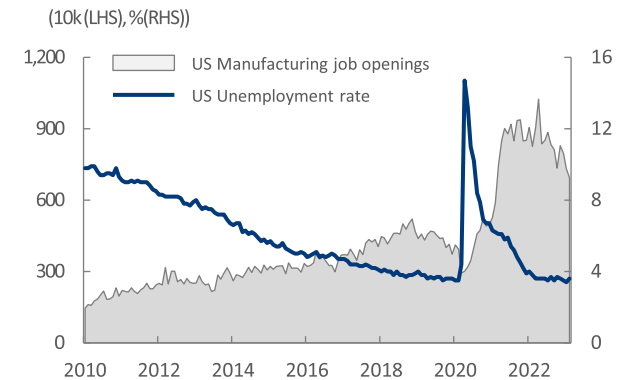
Increasing aversion to 3D / repetitive labor

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




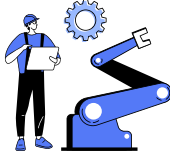
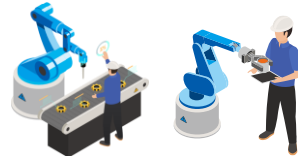

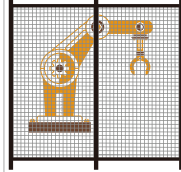
Source: U.S. Bureau of labor statistics

Cobot optimized for targeting potential market

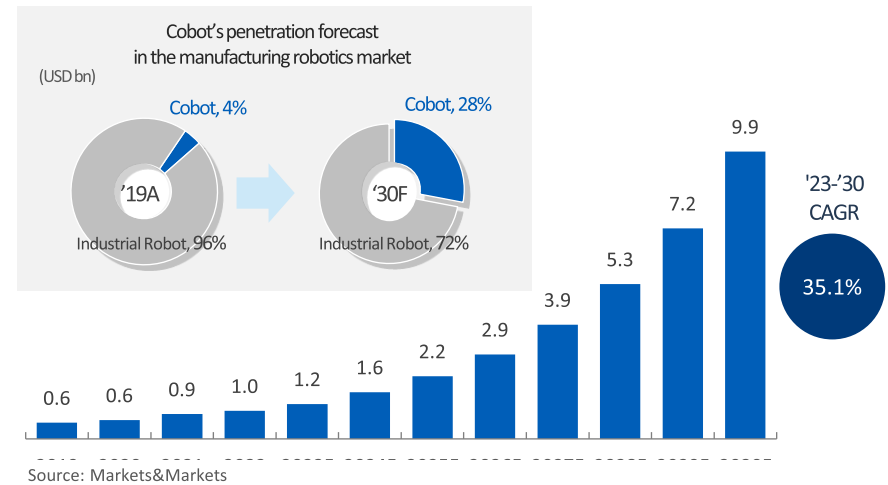


Robust growth of cobot market is expected with a replacement of human labor and Cobot is expected to vastly penetrate to wider markets including professional and personal service market

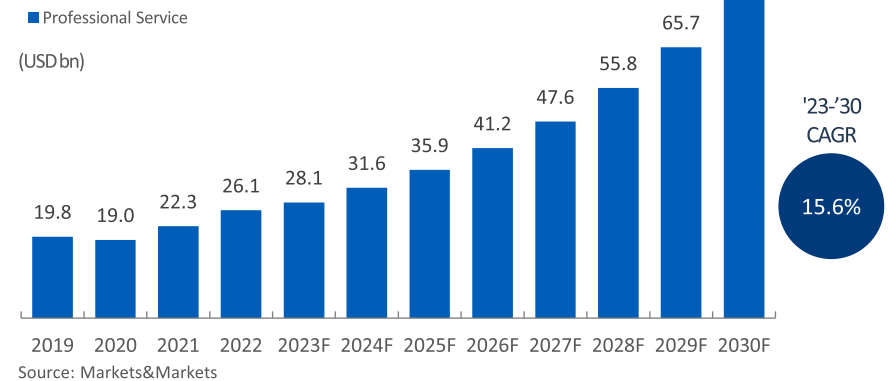
Why Cobot?

	Feature	Industrial	Professional Service	Personal Service
Cobots 	<ul style="list-style-type: none"> Safety Light weight Easy control 	 Interaction with human / Low initial cost	High Expandability  Combination with mobility and vision / Diverse applications	
Industrial Robots 	<ul style="list-style-type: none"> High Danger Fence needed Heavy weight 		Low expandability due to inability to interact with human	

Cobot market outlook



Service robot market outlook (1)



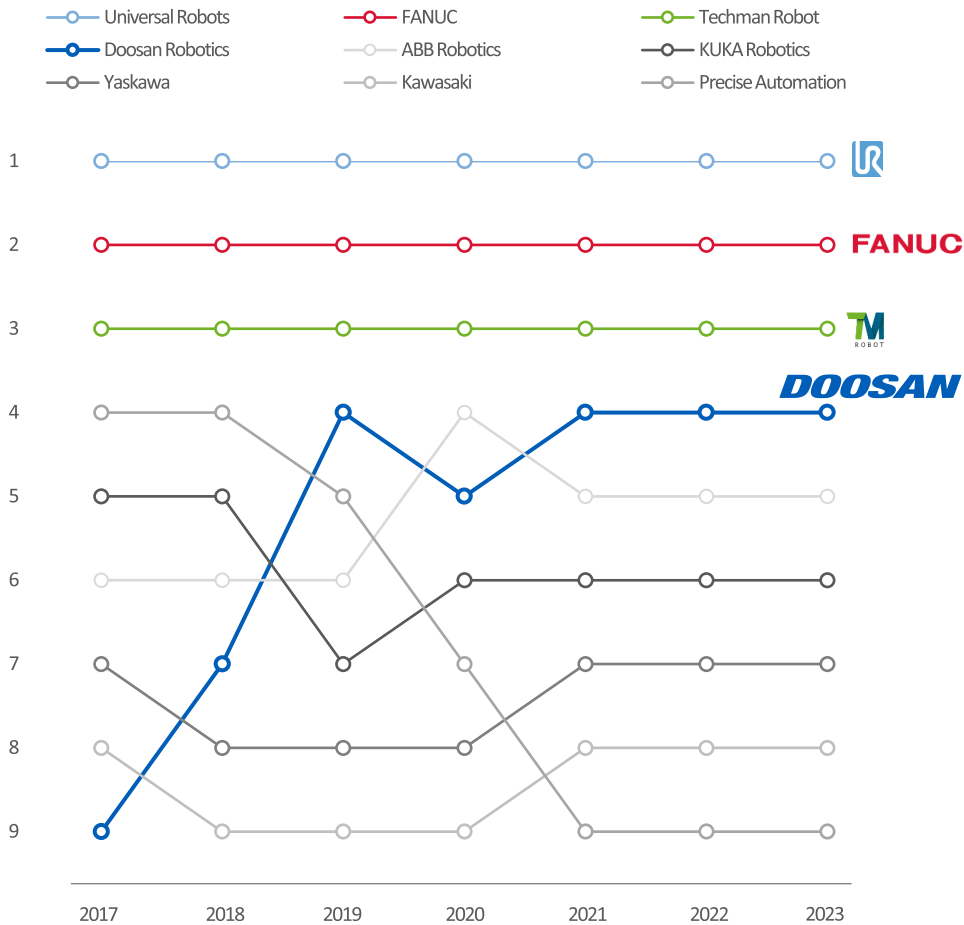
(1) Professional service robots are robots used for commercial purposes, and do not include personnel robots (i.e. robot vacuum cleaners, drones, etc.) used by individuals for non-commercial purposes.

Most rapidly growing global leading robotics company



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

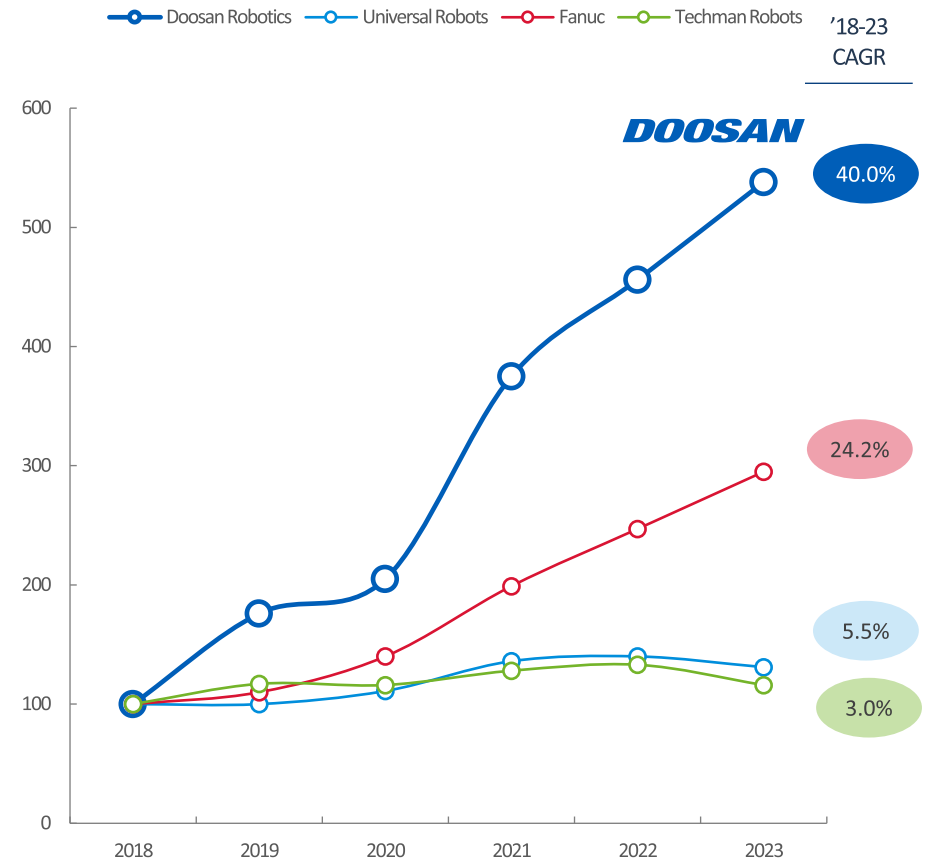
Cobot market share ranking (excl. China market)



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

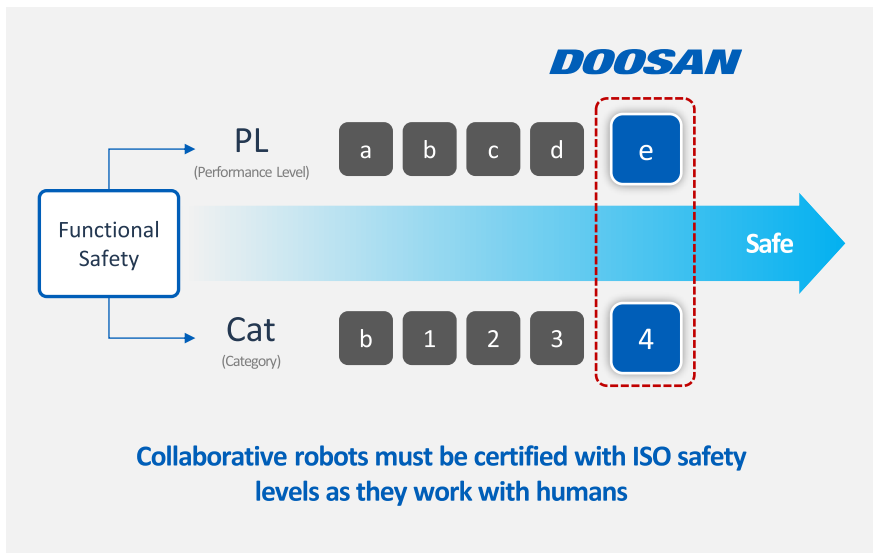


DR is certified with the highest safety rating among leading global cobot manufacturers

Best-class safety certificates

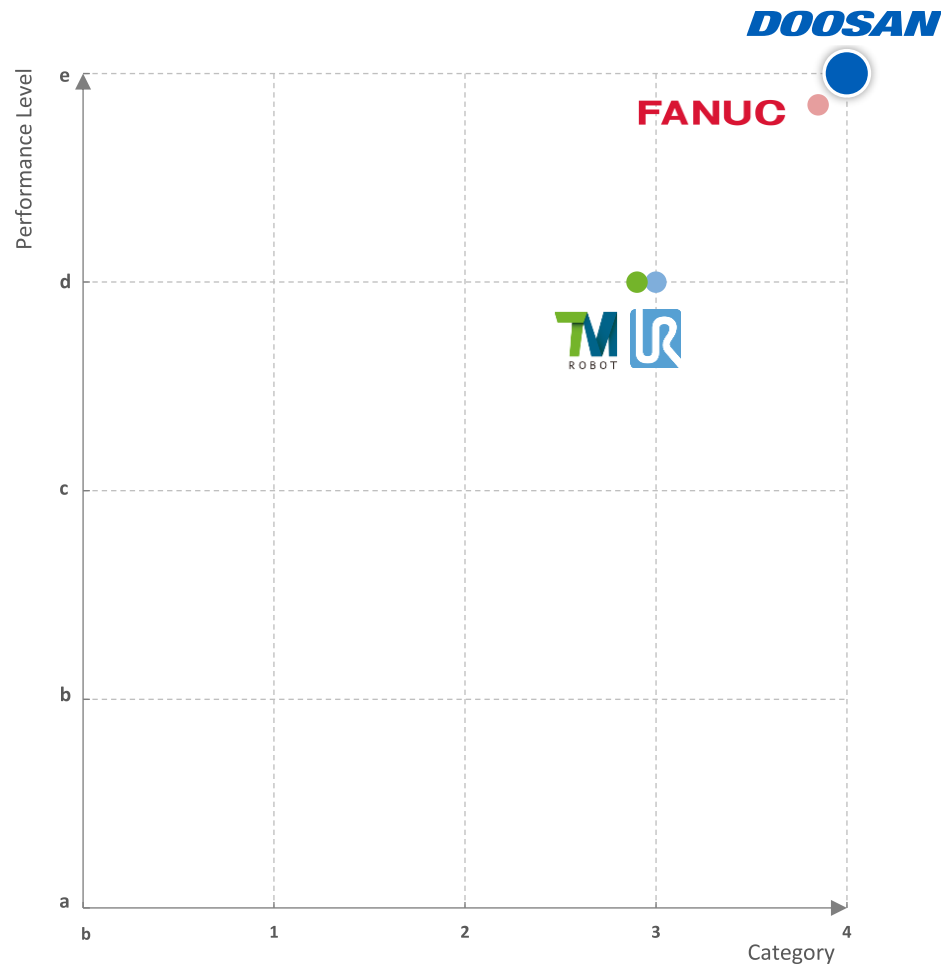
PL e, Cat 4 Certification

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



Source: Company data
 (1) Limited to a few models

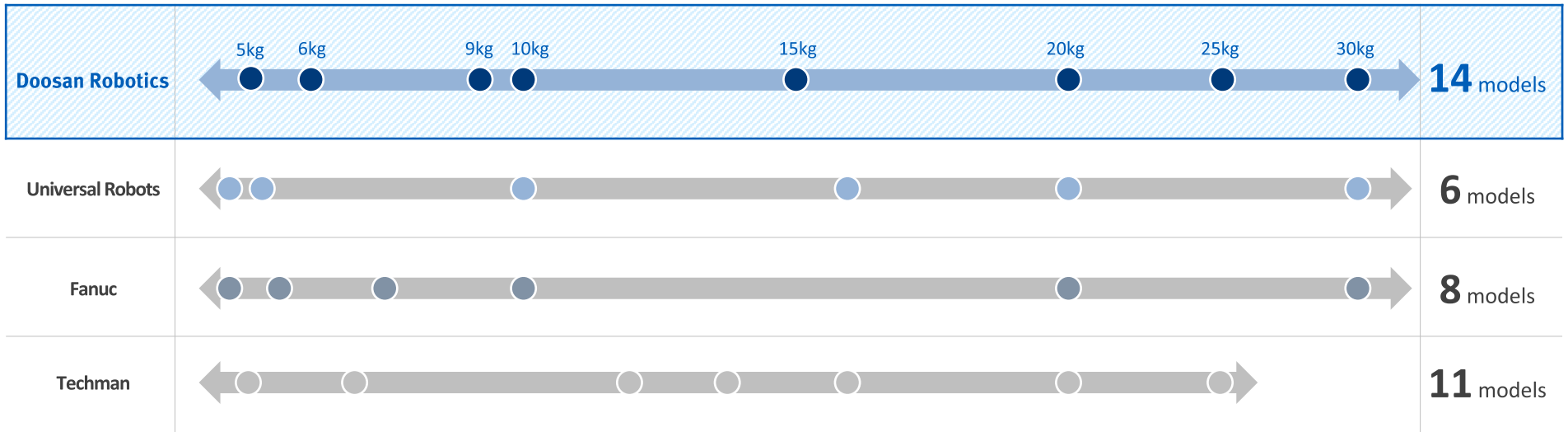
Diverse product portfolio



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

Pioneering the new markets with high payload and wide work range and strong dominance in 20kg+ Payload Cobot market

Product portfolio of major cobot makers⁽¹⁾



Source: Markets&Markets

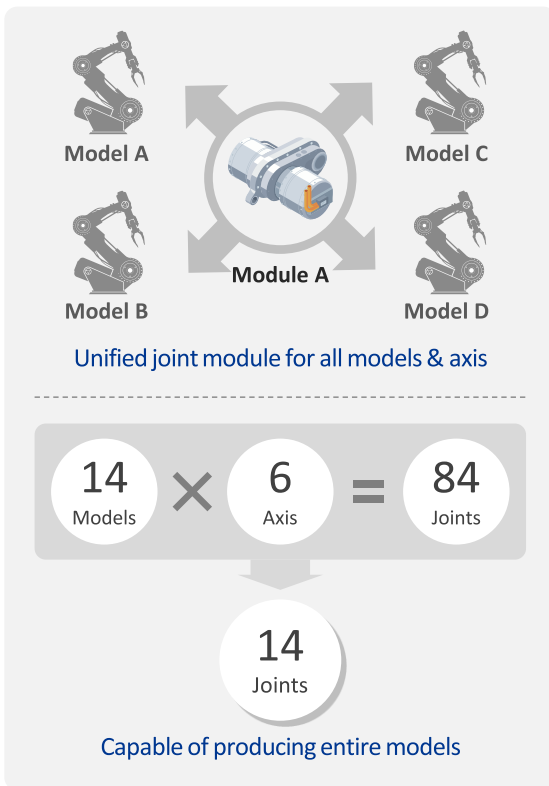
(1) Based on Markets&Markets research data excluding models that weights more than 100kg

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

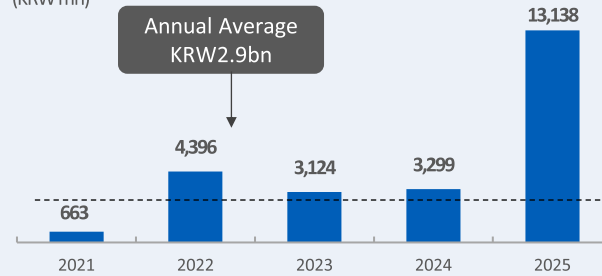


Simplified manufacturing process

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

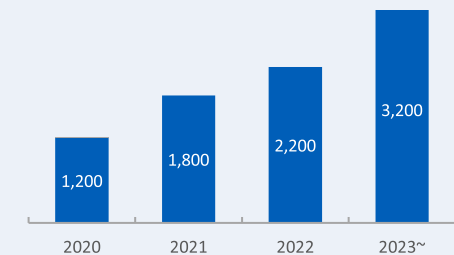
CAPEX trend (excl. intangible asset)

(KRW mn)



Annual capacity

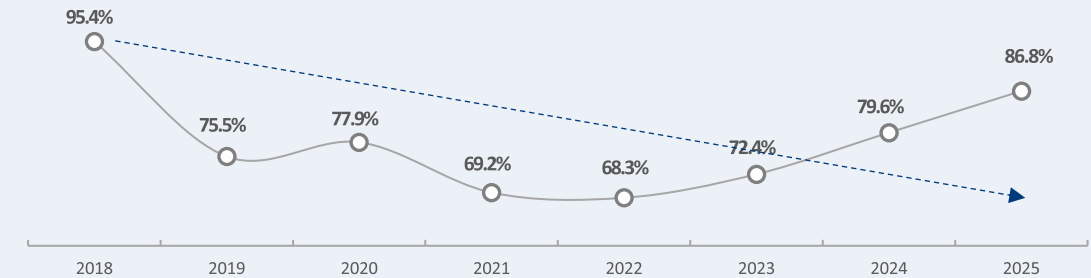
(Unit)



Enhanced raw material composition

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

CoGs % to sales

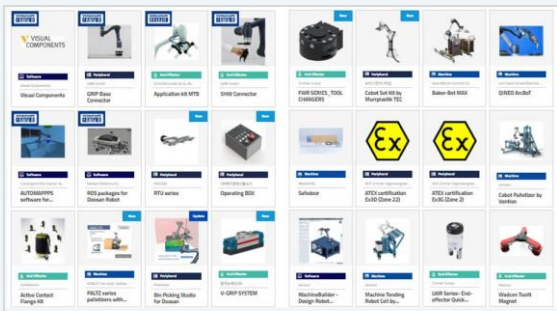


Outstanding user convenience



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

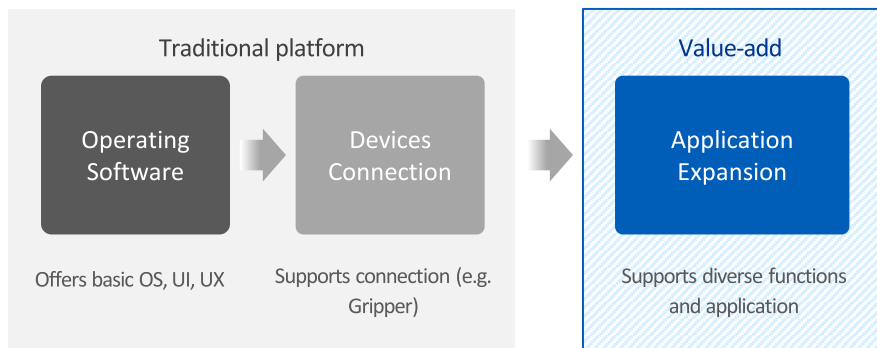
(1) End of Arm Tooling: An accessory that attaches to the end of a robot that allows the robot to perform a specific action, such as grabbing an object or tightening a screw



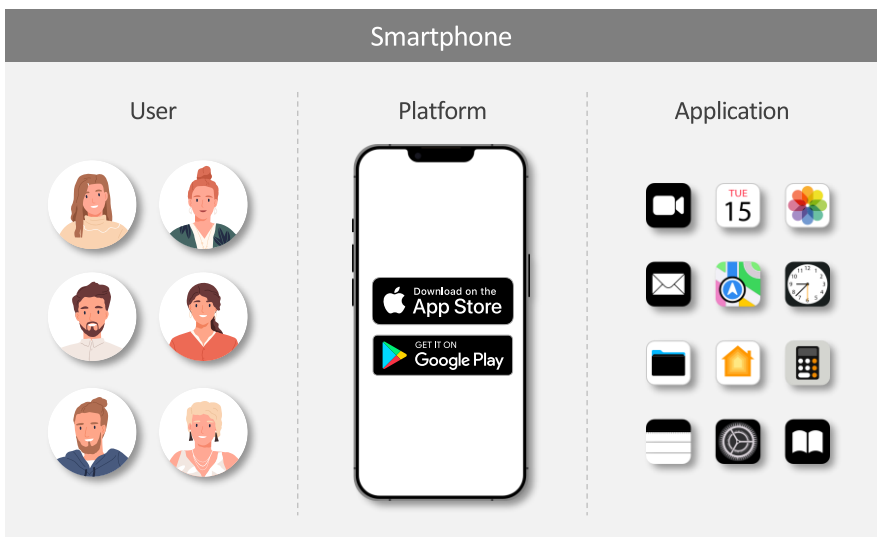
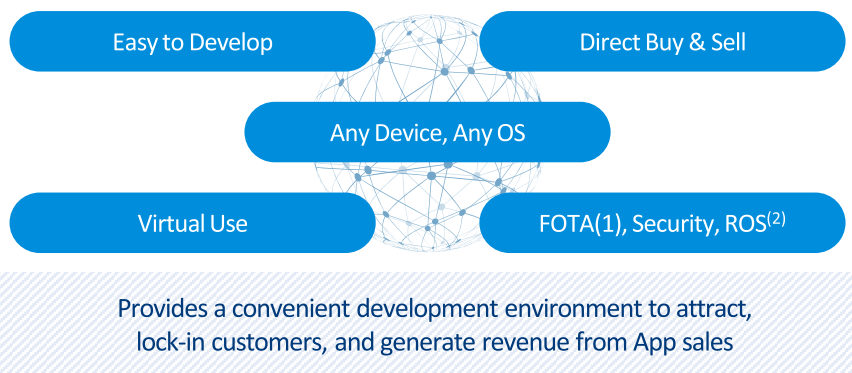
Establishment of a software platform

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

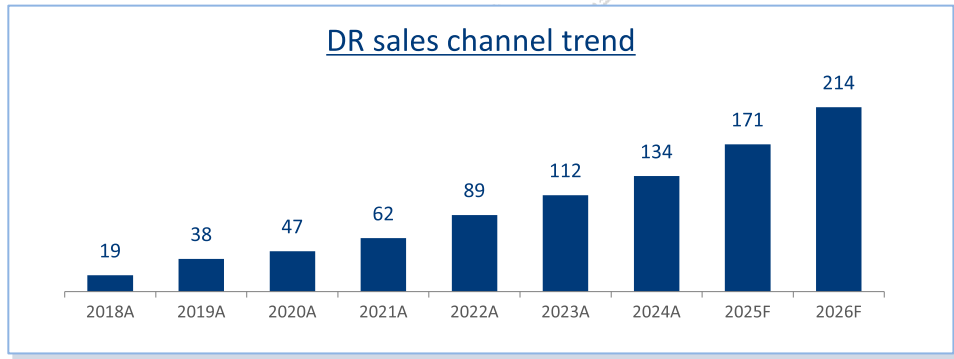
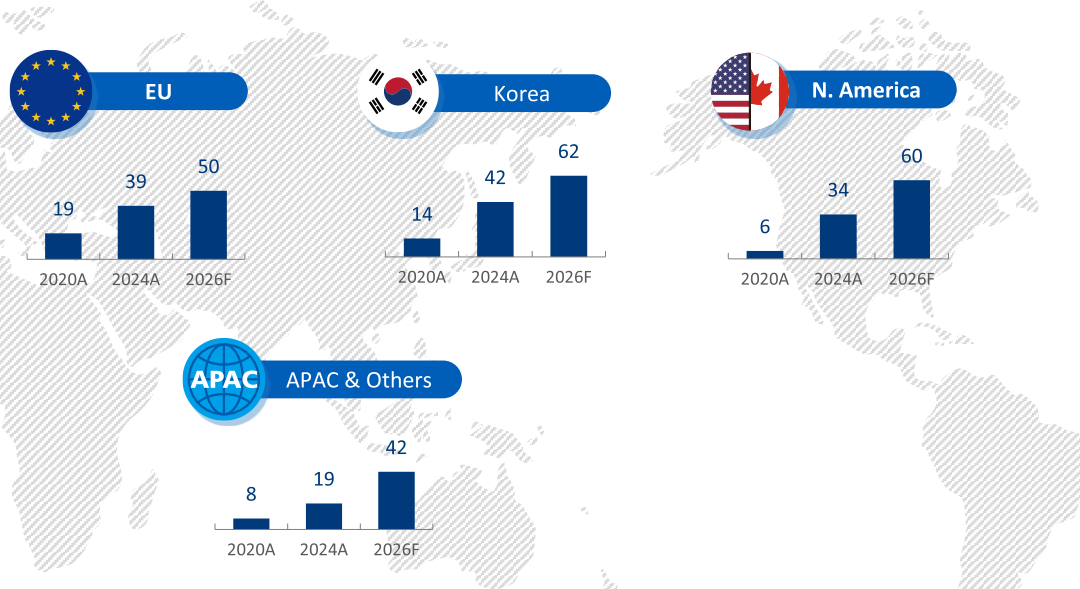


(1) FOTA(Firmware Over-The-Air): Updating Software remotely (First to developed and implemented in the robot industry)
 (2) ROS: Robot Operating System

True global player with comprehensive sales network in advanced markets

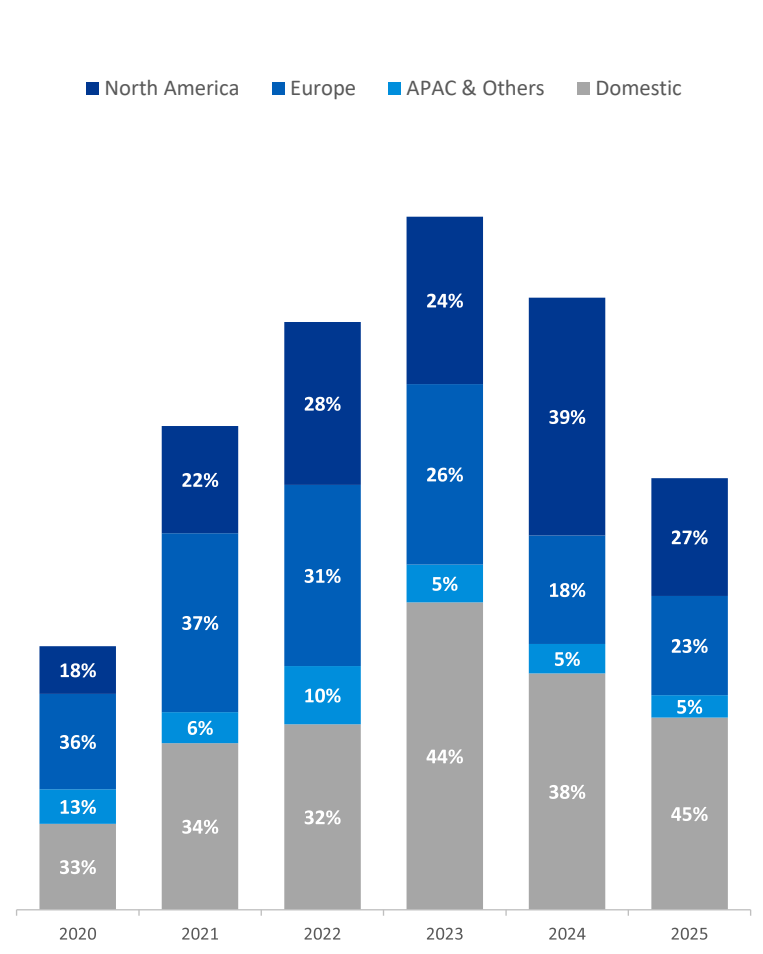
DR possesses strong global presence with 100+ global sales channels, generating more than 60% of its revenue from overseas (North America, Europe, etc.)

DR global sales network



Source: Company data

DR sales geography breakdown



Proven track record



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	

Source: Company data

Expansion through global partnerships



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



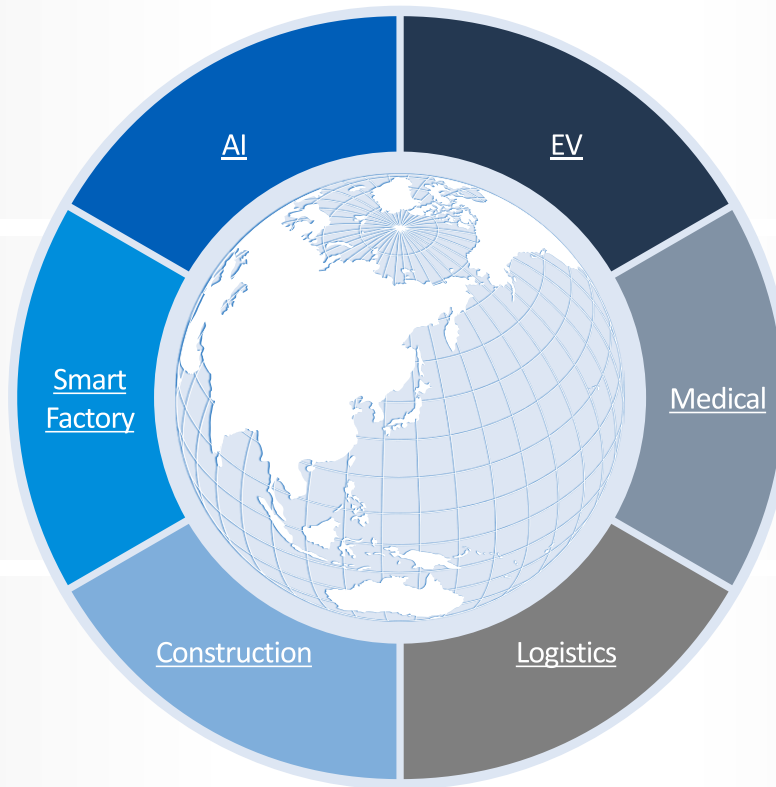
세브란스병원 SEVERANCE HOSPITAL

Joint development of
medical solutions



Cobot Lift

Joint-development of lift-
applied luggage solution



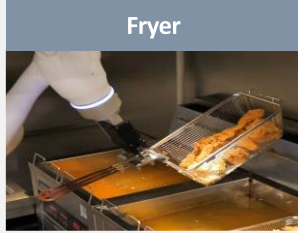




Diversified application backed by accumulated know-hows

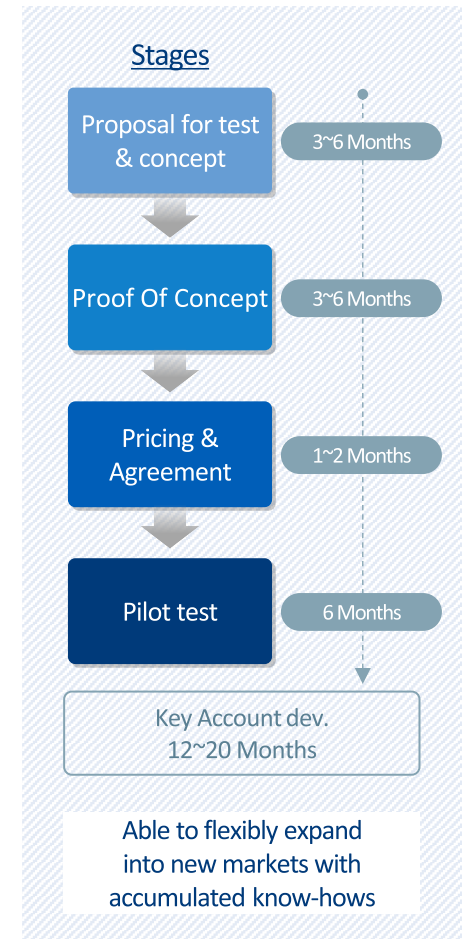


Able to flexibly expand into new markets and applications with accumulated know-hows with each Key Account, which takes 12 to 20 months of development/testing

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>Global Top Automobile OEM</p> <p>Assembly</p>  <ul style="list-style-type: none"> Rear wheel shock absorber assembly 	<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>Chicken Franchise G</p> <p>Fryer</p>  <ul style="list-style-type: none"> Automated chicken fry
<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>Automobile part maker B</p> <p>Gluing</p>  <ul style="list-style-type: none"> Mat gluing for automotive moldings 	<p>Beverage Manufacturer D</p> <p>Palletizing</p>  <ul style="list-style-type: none"> Product pack palletizing 	<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. Driving AI-driven innovation for Industrial Humanoids
03. Financial statements



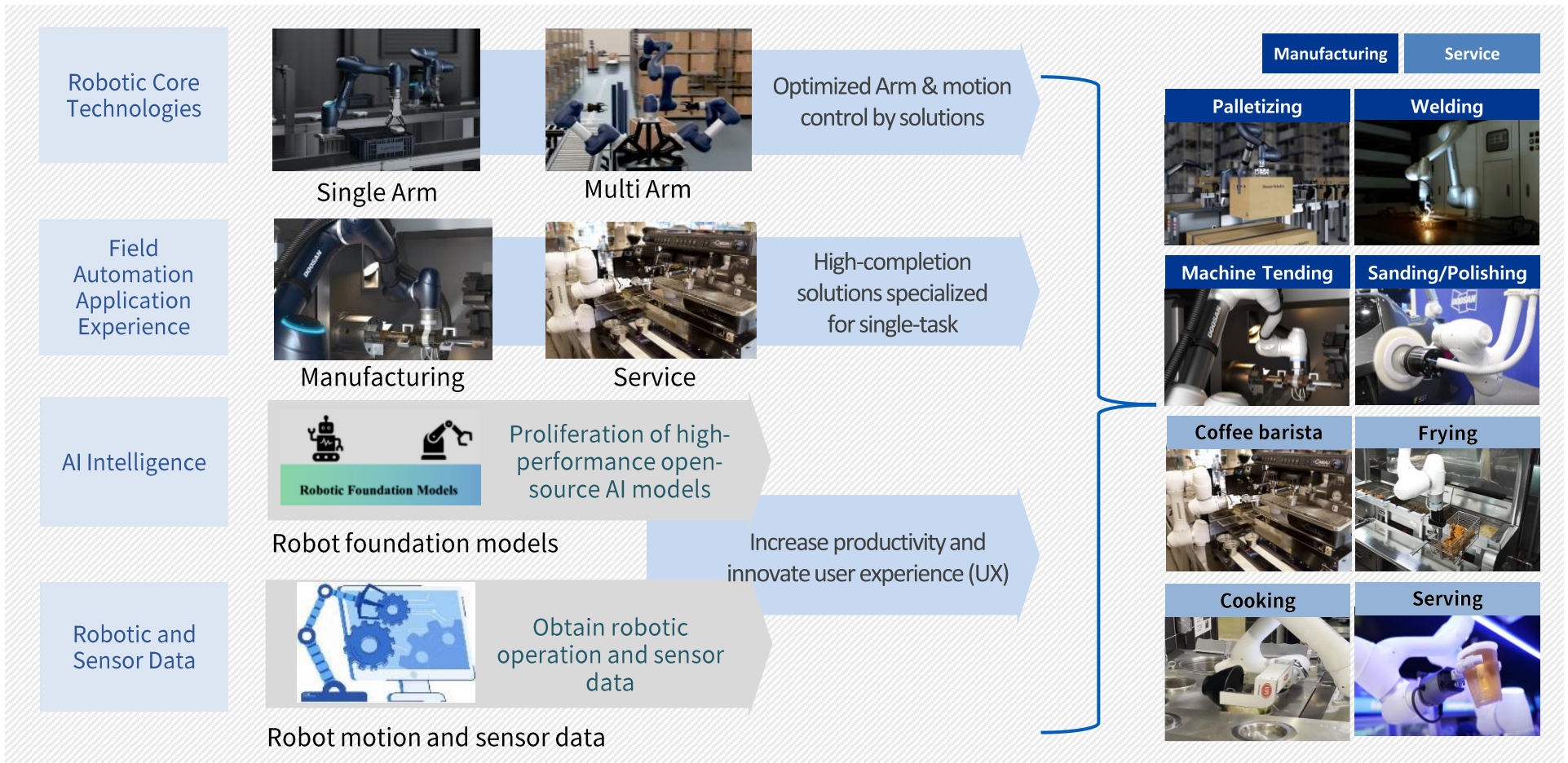
Strengthening AI-based Robot Solutions business model



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



'Industrial Humanoid' commercially viable with skilled worker-level capabilities



Targets an 'Industrial Humanoid' designed for real manufacturing use cases and commercial deployment

Latest technology of humanoid companies



- Simple Pick & Place (Automated parts transport)
→ Incapable of non-standard, complex task (mixed-part handling & assembly)

- Housework (laundry handling, kitchen tasks)
→ Incapable of diverse tasks in narrow, obstacle-rich home environments

- Boxing, acrobatic performances
→ No demand for task automation



General-purpose oriented, but limited in real-world task replacement and reliability

Doosan Robotics' Industrial Humanoid



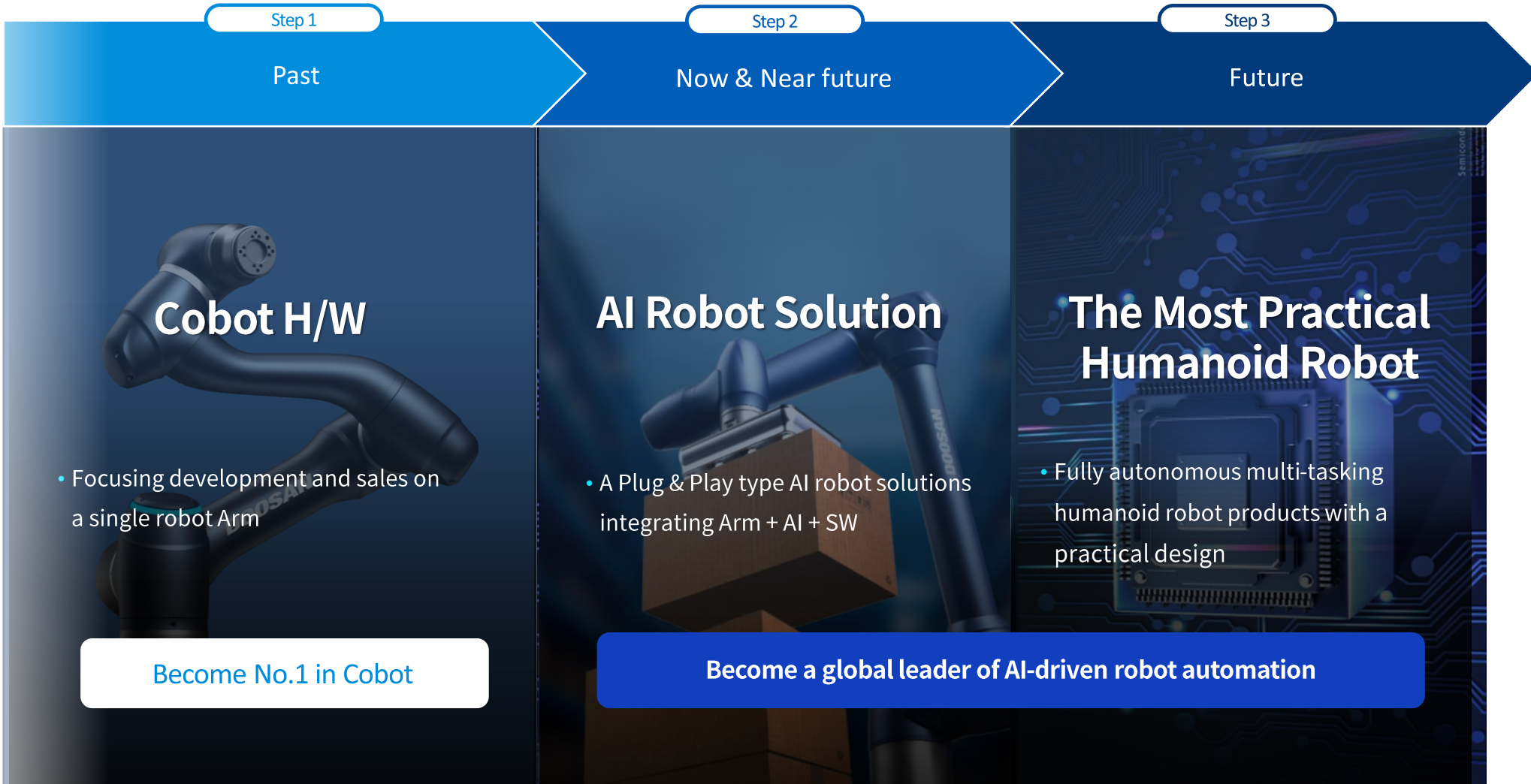
- AI technology
 - Perception: recognition of non-standard objects
 - Mobility: vertical and horizontal for extended operational range (Wheel-based)
 - Manipulation: motion optimization enhancing speed & quality (Cobot-based)

- Differentiation
 - Performing non-standard tasks at a skilled-worker level
 - Simplified product configuration to improve ROI

Leading Physical AI market through RFMs (Robot Foundation Model) based industrial Humanoids

Driving AI-driven innovation for Practical Humanoids

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



Consolidated Income Statement

Unit: KRWmn

	FY2022	FY2023	FY2024	FY2025
	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited
Revenue	44,954	53,038	46,830	32,978
Cost of Goods Sold	30,710	38,378	37,300	28,560
Gross Profit	14,244	14,660	9,530	4,419
SG&A Expense	27,472	33,828	50,732	63,891
Operating Loss	(13,228)	(19,168)	(41,202)	(59,472)
Financial Income	819	4,389	15,439	9,521
Financial Expense	1,027	1,907	701	1,870
Other Non-op. Income	981	1,907	2,085	266
Other Non-op. Expense	93	309	11,744	3,432
Pre-tax income	(12,548)	(15,874)	(36,553)	(55,495)
Tax expense	-	-	-	-
Net Loss	(12,548)	(15,874)	(36,561)	(55,495)

Source: Company data

Consolidated Balance Sheet

Unit: KRWmn

	FY2022	FY2023	FY2024	FY2025
	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited	K-IFRS, Audited
Current Asset	38,837	426,105	342,029	266,961
Cash & Cash Equivalent	7,430	305,424	265,536	156,739
Accounts Receivables	10,644	22,236	28,334	17,772
Inventory	13,391	14,154	29,307	19,010
Other Current Asset	7,372	84,291	18,852	73,440
Non-current Asset	23,782	30,317	79,662	132,409
PP&E & Intangible	15,973	21,657	18,826	72,316
Other Non-current Asset	7,809	8,660	60,836	60,093
Total Asset	62,619	456,422	421,691	399,370
Current Liabilities	14,738	13,353	15,446	27,822
Accounts Payable	3,875	5,894	4,321	4,333
Short-term debts	-	-	-	-
Other Current Liabilities	10,863	7,459	11,125	23,489
Non-current Liabilities	5,116	4,261	3,743	22,954
Lease Liabilities	3,418	3,773	1,691	13,001
Other Non-current Liabilities	1,698	488	2,052	9,953
Total Liabilities	19,854	17,614	19,190	50,776
Common Equity	24,310	32,410	32,410	32,410
Total Equity	42,765	438,808	402,501	399,370

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

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