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Research

Humanoid Robot:

Mid-year reality check; Ecosystem flywheel spinning

Iris Zheng, Head of APAC Automation & Industrials | +852 2203 5884 | iris.zheng@db.com
Edison Yu, Head of US Autos & Mobility | +1 917 893 2023 | edison.yu@db.com
Laura Li, US Autos & Mobility | +1 212 250 2266 | laura.li@db.com
Winnie Dong, US Autos & Mobility | +1 212 250 5121 | winnie.dong@db.com

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Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Executive summary: Mid-year reality check; Ecosystem flywheel spinning

We provide an update of the developments in 1H26 and upgrade our market forecast in this report. For our detailed visions, refer to our report: Six visions for 2026 – Scaling, iterating and diversifying. For the comparison of players, refer to our report: Comparing Unitree, UBTECH, DEEP, Dobot and Leju.

We raise our 2026E global shipment forecast to ~80,000 units, up from our previous estimate of ~50,000 units, as China's humanoid robot production of 40,000+ units in 1H26 outpaced our expectations. Industry development is accelerating, supported by a self-reinforcing ecosystem flywheel consisting of hardware, model, data, and application. Aside from entertainment and academic research, humanoids are increasingly being adopted in industrial scenarios. Although they are not yet commercially viable, task success rates are improving, and the sector could reach a breakthrough point before 2030, driven by the continuous scaling of data, ongoing model evolution, and declining costs.

1) **Mid-year reality check.** In China, manufacturers are scaling rapidly and government officials point to over 40,000 units of humanoid robots produced in 1H26. Cumulative humanoid robot production reached 11,000 units (bipedal only) by May 2026 for Unitree, whilst AGIBOT reached 15,000 units (embodied AI robots) by June 2026. In the US, Tesla has installed its first production line for Optimus designed for 1mn robots a year, although the initial ramp-up is slow. Figure has accelerated its production, increasing output from one unit per day to one unit per hour.

2) **Upgrade our market forecast.** We now project global humanoid robot shipments to approach ~80,000 units in 2026E (from ~50,000 units previously). We expect China to remain the largest humanoid robot market, contributing ~70,000 units in 2026E. We anticipate shipments from other regions—including the US, Europe, Japan, and South Korea—to also increase, driven by the "local-for-local" demand.

3) **Ecosystem flywheel spinning.** We believe the ecosystem flywheel for humanoid robots comprises hardware (component and body), model (the "brain"), data, and application. Whilst some players (such as Tesla, Unitree, AGIBOT, UBTECH) aim to achieve full-stack capability, some (such as Physical Intelligence) choose to focus predominantly on models, and others (such as Boston Dynamics) on hardware with collaborations with Google DeepMind and NVIDIA for model and platform capabilities.

4) **Real-life success rate.** Whilst humanoid robots already present a viable business case for entertainment performances and academic research scenarios, they are not yet commercially viable for industrial applications. The payback period is typically above two years, with task success rate varying from over 99% to below 50%. However, some industry experts believe the sector could reach a breakthrough point before 2030, driven by the continuous scaling of data, ongoing model evolution and declining costs.

5) **US bans foreign-produced advanced robotic devices.** The policy does not affect existing humanoid robot models sold in the US, but raises questions of new humanoid imports into the US. We think the policy is somewhat as expected, but the broad scope to include not only humanoid and quadrupedal robots, but also other forms of mobile robots suggests increasing political importance of embodied AI robots globally.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Executive summary: Stock implications

APAC Automation & Industrials sector – Covered by Iris Zheng

Our preferred names for the humanoid robot theme are:

- **Hengli Hydraulic (601100.SS, BUY, target price RMB124):** Hengli is achieving increasing content per robot (including body screws, body motors, hand motors, etc.) and broadening customer base for humanoids. We forecast RMB100-200mn in revenues from humanoid robot components in 2026E and anticipate exponential revenue growth in 2027E if production ramp-up proceeds smoothly at its customers. The healthy construction machinery market also provides support. Other growth opportunities include components for bionic robotic legs and arms, space applications, and machine tools. Link to report.
- **Shuanghuan Driveline (002472. SZ, BUY, target price RMB47):** Tesla is exploring new types of reducers for higher payload rotary actuators, which presents an opportunity for Shuanghuan, as the company has been conducting R&D with Tesla on robots for over three years. Whilst the core business of car gearbox is under pressure in 2026E, we expect growth from new business segments, including reducers for traditional robots and industrial equipment, as well as smart actuators for robot vacuum cleaners, drones, and eBikes. Shuanghuan also demonstrates overseas expansion potential. Link to report.
- **Harmonic Drive Systems (6324.T, BUY, target price ¥9,900):** HDS is expanding into actuators for humanoid robots, which presents a 3x ASP opportunity compared to reducers alone. We believe HDS is a key reducer supplier for humanoid robots outside of China. The growth opportunity is further supported by its products for the space and the semiconductor sectors which are fast growing. Link to report.

US Autos & Mobility sector – Covered by Edison Yu

The following companies are well-positioned to benefit from the burgeoning humanoid robotics industry:

- **Tesla (TSLA.US, BUY, target price US$420):** Optimus represents a high performance vertically integrated design for a humanoid with plans to ramp-up production later this year. Importantly, the hand has been a hardware bottleneck but should be resolved now, further supported by greater compute capacity to train the models. We expect a step-up in internal deployments by 4Q26 followed by external sales in late 2027/early 2028 for industrial use cases.
- **Mobileye (MBLY.US, BUY, target price US$13):** Following the acquisition of Mentee Robotics earlier this year, Mobileye aims to offer a relatively low-cost humanoid for warehouses and other commercial applications. Mentee's BoM even at very low volume is ~$50k with path to reduce by 50% as volumes scale up into the thousands which may happen in 2028-29. The company is working with several customers proof-of-concept deployments this year. Tactically, we think Mentee's efforts are largely underappreciated and could surprise to the upside in the next 9-12 months.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Links to Deutsche Bank humanoid robot reports

Key reports:

- **Humanoid Robot comparison:** Comparing Unitree, UBTECH, DEEP, Dobot and Leju: Opportunities and risks coexist - 15 Jun 2026
- **Humanoid Robot sector report (III):** Six visions for 2026 – Scaling, iterating and diversifying - 6 Mar 2026
- **Humanoid Robot sector report (II):** Go big and go home – 14 Feb 2025
- **Humanoid Robot sector report (I)**: Stay selective; Humanoid robots lift growth prospects - 23 July 2024

Takeaways from expert calls and events:

- **Humanoid Robot:** US bans foreign-made robotics (humanoid, quadruped, mobile robots) - 29 Jul 2026
- **Rise of Humanoid Robots expert call (IV):** Takeaways from a Chinese humanoid robot expert - 27 Jul 2026
- **Mobileye:** Mentee humanoid deep dive – 9 Mar 2026
- **Rise of Humanoid Robots expert call (III):** Expert call with Humanoid - 4 Dec 2025
- **Rise of Humanoid Robots expert call (II):** A leading Chinese humanoid robot start-up – 17 Jun 2025
- **Takeaways from Taiwan Machine Tool Show (TIMTOS):** Humanoids, demand… - 5 Mar 2025
- **Rise of Humanoid Robots expert call (I):** Expert call with Agility Robotics - 20 Feb 2025
- **Takeaways:** UBTECH Robotics company visit – 9 Aug 2024

New developments:

- **Humanoid Robots Pulse (2Q26 edition):** US activities stepping up; China scaling fast; Supportive policies - 16 Jul 2026
- **Humanoid Robots Pulse (1Q26 edition):** OpenClaw for robots; US tightening policy; Shape varying - 1 Apr 2026
- **Humanoid Robots Pulse (4Q25 edition):** Emerging electronics and Japanese players; Humanoid policy - 18 Dec 2025
- **Humanoid Robots Pulse:** Tesla, Sanhua, AgiBot, Unitree, Figure update - 23 Oct 2025
- **European marketing feedback:** Humanoid robot, China market, … - 5 Oct 2025
- **Humanoid Robots Pulse:** Tesla Optimus; Unitree IPO; Nvidia and Hon Hai - 12 Sep 2025
- **Humanoid Robots Pulse:** Tesla update; Unitree new model and potential listing - 8 Aug 2025

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com



Mid-year reality check: China on track for a strong year; US picking up

Mid-year reality check: China on track for a strong year; US picking up

In **China**, the Ministry of Industry and Information Technology (MIIT) forecasts **humanoid robot production to reach 100,000 units in China in 2026**, representing a fivefold increase from the ~20,000 units produced in 2025. This growth is well underway, with 1H26 production already exceeding 40,000 units. At the corporate level, manufacturers are scaling rapidly: **Unitree** is targeting 10,000–20,000 bipedal units for 2026, whilst **AGIBOT** is aiming for 20,000–40,000 embodied units.

In **the US**, **Tesla**'s manufacturing ramp-up is following an "S-curve" profile, characterised by a slow initial phase. Our channel checks suggest the target production rate is set at 100 units per week in July 2026, scaling to 1,000 units per week by 3Q26, and over 2,000 units per week by the end of 2026. Meanwhile, **Figure** has accelerated its production, increasing output from one unit per day to one unit per hour, culminating in ~150 units produced in April 2026.

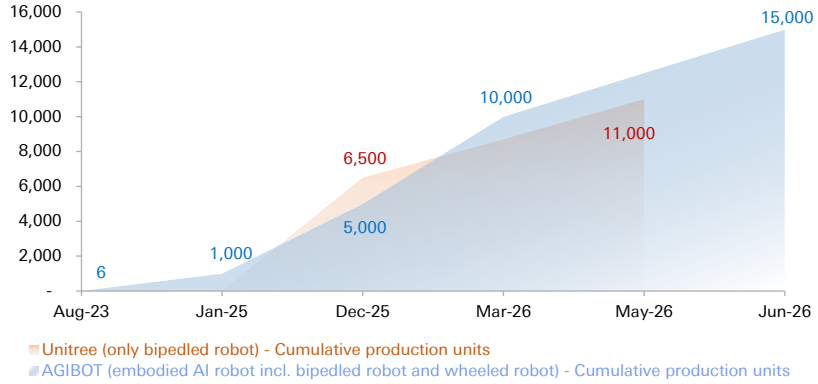
Global humanoid robot shipment forecast (unit) – including bipedal and wheeled humanoid robots

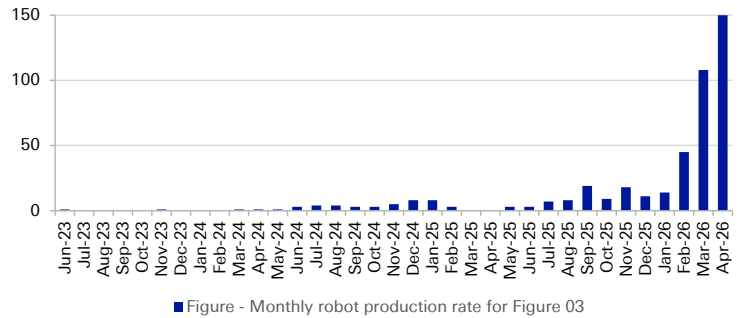
Humanoid Robot Shipment/Production (unit)	1H26	2026E	2027E-2030E	Details
United States				
Tesla	"S"-curve manufacturing ramp		Co (Jul 2025) : Getting to **1mn units** per year in less than five years	Co: First generation lines in Fremont designed for **1mn units per year** (Optimus 3). Texas lines designed for **10mn units per year** (Optimus 4).
Figure	150 units in April 2026; production increase from 1 unit per day to 1 unit per hour		Co (Jan 2025): Potential to ship **100,000 units** over the next four years	Initial production lines can manufacture up to 12k humanoids per year
Boston Dynamics	Co (as of Jan 2026): to build 200-300 humanoids to collect data		Co (Jan 2026): Target **30,000 units per year** by 2028, **tens of thousands** per year by 2030	To build a factory designed for mass production
1X	-		Co (May 2026): Target **10,000 units** in year one and **100,000** by end of 2027	-
China				
Unitree (宇树)	Cumulative bipedal humanoid robot production of 11,000 by May 2026	Co (Feb 2026): Target **10,000-20,000** bipedal units in 2026	-	Co (July 2026): Could expand annual production capacity to 30k units in 2026
AGIBOT (智元)	Cumulative production: 15,000 by 26 June; 10,000 by end of March	Co: **20,000-40,000 units** in 2026	-	**Mid-term Revenue:** Co (Apr 2026): Revenue RMB1.05bn in 2025, target RMB10bn by 2027 and RMB100bn by 2030 ('358 Grand Plan')
UBTECH (优必选)	Co (Apr 2026): Target **5,000 units** of Walker S; **5,000 units** of Walker C & Tiangong; **20,000 units** of U1 bionic robots		Co (Mar 2026): Target **over 10,000 units** for industrial scenarios in 2026-2027; prepare for over **1mn units** from 2028	To expand horizontally into industries such as consumer electronics manufacturing
China total	Over 40,000 units produced	**100,000 units** to be produced in 2026 (~20,000 in 2025)	-	
Europe				
NEURA	-		Co (Jun 2026): **Multi-million** robots by 2030	NEURA announced Series C financing of up to US$1.4bn in June 2026.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, company data, MIIT

Mid-year reality check: China on track for a strong year; US and Europe picking up

Humanoid robot production ramp-up at Unitree, AGIBOT and Figure





AGIBOT, Unitree, UBECH and Galbot are ranked as top 4 in China in 1H26 by MIR in terms of production units

Rank	1H26 China Humanoid robot body suppliers*	
	By production units	By shipment units
1	AGIBOT (智元)	AGIBOT (智元)
2	Unitree (宇树)	Unitree (宇树)
3	UBTECH (优必选)	Galbot (银河通用)
4	Galbot (银河通用)	UBTECH (优必选)
5	Leju Robotics (乐聚)	Beijing Innovation Center of Humanoid Robotics (北京人形创新中心)
6	Beijing Innovation Center of Humanoid Robotics (北京人形创新中心)	Leju Robotics (乐聚)
7	EngineAI (众擎机器人)	EngineAI (众擎机器人)
8	Robot Era (星动纪元)	Robot Era (星动纪元)
9	MagicLab (魔法原子)	MagicLab (魔法原子)

**Note: The data is from MIR. Data is restricted to production and shipment volumes within China only (excluding overseas/export volumes). Eligible models include full-sized bipedal, mid-to-small bipedal, and wheeled humanoid robots; it excludes models under 1m in height and consumer-grade humanoid robots.*

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Source: Company data, MIR

Comments from Elon Musk on humanoid robot plans since 2024 (1)

Date	Event	Comments from Elon Musk
7/22/2026	Tesla 2Q26 result	We have decommissioned the manufacturing lines for Models S & X at our Fremont Factory and are installing the first-generation lines for Optimus, where we expect **to start production soon**. The initial Optimus builds will be used in our Optimus Academy for training data collection and further functionality development. Additionally, we continued site development at Gigafactory Texas with building construction now in full swing. Optimus will follow the normal **S-curve of a manufacturing ramp**, but the **initial portion of the S-curve will be quite flat and long** because of the newness of the parts in the robot. And you've probably seen lots of impressive demonstrations of robots on the Internet, but those demonstrations are pre-programmed or remote-controlled. So, there is no humanoid robot that is actually able to do generalized tasks. Optimus will be the first one that is capable of doing that, where it's not just a demo. We'd aim to have an order of magnitude more production of Optimus 4 than Optimus 3 - aspirationally **10mn units a year versus 1mn units a year of Optimus 3**. But, with all the caveats there, which is insanely difficult to scale production. **Optimus 4 will be much more vertically integrated**, so probably doing a lot of the PCB work in-house for that.
4/22/2026	Tesla 1Q26 result	Preparations for the first large-scale Optimus factory will **begin shortly in Q2**. The first generation line, designed for **1mn robots a year**, will replace the Model S and Model X lines in Fremont. We are also **preparing Gigafactory Texas** for the second-generation line, which is being designed for long-term annual production capacity of **10mn robots (probably start production around** summer next year**)**. I think probably **middle of this year, we should be able to show it off V3 Optimus**. We're a little **hesitant to show V3 off** because we find our competitors do a frame-by-frame analysis whenever we release something and copy everything they possibly can. I think we want to push the Optimus 3 unveil maybe closer to production. **Start of production we're assuming is somewhere around the late July, August timeframe**. It takes four months to dismentle an entire production line for S/X and reinstall a whole new line for Optimus. I **don't know what the production rate of Optimus will be this year**. It is impossible to predict these things. We can put a lot of intelligence locally in the robot as Optimus needs to be enough intelligence that if the robot gets disconnected. If you want to talk to Optimus and have a Grok level conversation, you need to connect to a Grok level AI for that. Our current expectation for 2026 is over $25 billion of CapEx.
1/28/2026	Tesla 4Q25 result	We're going to take the Model S and X production space in our **Fremont factory** and convert that into an Optimus factory, with the long-term goal of having **1mn units a year of Optimus robots** in the current S/X space in Fremont. We are expecting that **CapEx** would be in excess of **$20bn**. We'll be paying for six factories, namely the refinery, LFP factory, Cybercab, Semi, a new Megafactory, the Optimus factory. We'll probably **unveil** Optimus 3 **in a few months**. We **wouldn't** expect to have any kind of significant Optimus production volume **until probably the end of this year**. The biggest **competition** for humanoid robots will be from **China**. We think Optimus will be much **more capable** than any robot that we are aware of under development in China. So we think we'll be ahead in terms of the real-world intelligence, the electromechanical dexterity, especially the hand design, which is by far the hardest thing in the robot.
11/6/2025	Compensation package	Shareholders approved a compensation package for Elon Musk with potentially **US$1tn** worth of stocks **over the next 10 years**. The package has set market-cap milestone and several operational milestones including 20mn Tesla vehicles delivered, 10mn active FSD subscriptions, **1mn Bots delivered**, 1mn Robotaxis in commercial operation and milestones for adjusted EBITDA of different levels.
10/22/2025	Tesla 3Q25 result	We look forward to **unveiling Optimus V3 probably in Q1**. We'll have a production intent prototype ready to show off in Q1, **probably February or March**, and then we're going to be building **a 1mn unit Optimus production line**, hopefully with **the production start towards the end of next year**. But that production ramp will take a while to get to annualized rate of 1mn. And then, ultimately, we'll do **Optimus 4 that will be 10mn units**, **Optimus 5 maybe 50mn to 100mn units**. Optimus V3 won't even seem like a robot. It'll seem like a person in a robot suit. **The forearm and hand** is more difficult than the entire rest of the robot. If Optimus achieves **5x the productivity of a person** per year because it can operate 24/7, it doesn't even need to charge - it's **plugged in the whole time**. We've made radical improvements to the design of Optimus while increasing the functionality, but making it actually **possible to manufacture**. Optimus 2 is almost impossible to manufacture frankly. For Optimus voice recognition, it uses **Grok for voice generation**.
7/24/2025	Tesla 2Q25 result	We're on Optimus version 2 right now, sort of 2.5. With Optimus 3, which is really the right design. We are going to retool a bunch of things. So it's going to probably be **prototypes of Optimus 3 end of this year, and then scale production next year.** That's a reasonable aspiration, **1mn units a year in five years**. It seems like an achievable target. I'd be surprised if we are not roughly making **100,000 Optimus robots** a month in 60 months.
4/23/2025	Tesla 1Q25 result	We expect to have **thousands of Optimus robots** working in Tesla factories **by the end of this year** (**most** of that production is going to be **at the end of the year**). I feel confident in getting to **1mn units per year in less than five years**, maybe four years. So, by **2030**, I feel confident in predicting 1 million Optimus units per year, it might be **2029**. Our high-volume vehicle programs have over **85% North America content**, and Shanghai vehicles have over 95% local content. Berlin has similar levels of regionalization as North America, when you exclude the battery. Now, Optimus was affected by the **magnet issue from China**, because the **Optimus actuators in the arm do use permanent magnets**. When something is volume constrained, like an arm of the robot, then you want to try to make the motors as small as possible. So, we did design in permanent magnets for those motors, and those were affected by the supply chain, by basically China requiring export license to send out any rare earth magnets. Hopefully, we'll get a license to use the rare earth magnets. For Optimus supply chain going forward, we'll have to see how things settle out. I don't know yet. We've already taken tremendous steps to **localize our supply chain**. With respect to humanoid robots, I don't think there's any company in any country that can match Tesla. Tesla and SpaceX are number one. I'm a little concerned that on the leaderboard, **ranks 2 through 10 will be Chinese companies**. But I'm confident that **rank 1 will be Tesla**.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Comments from Elon Musk on humanoid robot plans since 2024 (2)



Date	Event	Comments from Elon Musk
1/29/2025	Tesla 4Q24 result	The **training** needs for Optimus humanoid robot are probably at least ultimately **10x** what's needed **for the car**, at least to get to the full range of useful roles. A humanoid robot has probably 1,000x more uses and more complex things than in a car. That doesn't mean the training scales by 1,000 but it's probably 10x. You can do this progressively, so it doesn't mean Tesla is going to spend $500 billion in training compute because we will train Optimus to do enough tasks to match the output of Optimus robots. The cost of training is dropping dramatically with time. I think in the long-term Optimus has the potential to be north of **$10 trillion in revenue**. So you can obviously afford a lot of training compute in that situation. In fact, even $500bn training compute in that situation would be quite a good deal. The normal internal plan calls for roughly **10,000 Optimus robots to be built this year**. Will we succeed in building 10,000 exactly by the end of December this year? Probably not. But will we succeed in making **several thousand**? Yes, I think we will. Will those several thousand Optimus robots be doing useful things by the end of the year? Yes. Those Optimus in use at the Tesla factories for production design one will inform how would we change for production **design two**, which we expect to **launch next year**. It doesn't take very many years before we're making a 100 million of these things a year. If you go up by, let's say, **a factor by 5x per year**. For this year, Optimus could do dangerous, repetitive tasks that no humans want to do at Tesla, such as loading the hopper and transporting pieces of sheet metal to the robot welding line for the body. It's really with **production version 2**, which I think **launches sometime next year**. Maybe it's more like the middle of next year. And then we have to do it with a production line that is designed for on the order of 10,000 units a month versus 1,000 units a month. The current line that we're designing is for roughly **1,000 units a month** of Optimus robots. **The next line would be for 10,000 units a month, the line after that would be for 100,000 units a month.**
1/9/2025	Interview of Elon Musk	We will produce **several thousands** Optimus humanoid robots **in 2025** to be tested at Tesla factories. Assuming things go well, we'll **10x that output next year (2026)**, so we'll aim to do maybe **50,000-100,000** humanoid robots next year, and then **10x** it again the following year (**2027**). It's like **500,000** robots in three years (**2027**).
10/23/2024	Tesla 3Q24 result	With Optimus, we showed a massive improvement in Optimus' **dexterity movement** on October 10 and our next-gen handed form which is **22 degrees of freedom**, which doubles the prior handed form. Because the things that what other companies are missing is that they're missing the AI brain that they're missing the ability to really scale to very-high volume production.
10/10/2024	Tesla Robotaxi "We, Robot"	Fundamentally at-scale, you should be able to buy an Optimus robot for **$20,000 to $30,000** long-term. Optimus will basically do anything you want. So it can be a teacher, babysit your kids, it can walk your dog, mow your lawn, get the groceries, just be your friend, serve drinks, whatever you can think of, it will do.
7/23/2024	Tesla 2Q24 result	**Optimus** is already performing tasks in our factory, and we expect **to have Optimus production version 1** and **limited production starting early next year**. This will be for Tesla consumption. We expect to **have several thousand Optimus robots produced** and doing useful things **by the end of next year** in the Tesla factories. And **in 2026, ramping up production** quite a bit. And at that point, we'll be providing Optimus robots **to outside customers**. That'll be production version 2 of Optimus. So I suspect that the long-term demand for general-purpose humanoid robots is in excess of **20 billion units**.
6/13/2024	Tesla AGM	I think the ratio of humanoid robots to humans will probably be at least two to one. One to one, which means like, somewhere around the order of **10 billion humanoid robots. Maybe 20 billion or 30 billion**. I think the build rate will be probably ultimately like, **a billion a year humanoid robots**. If Tesla just has a **10% share** of that, and there are **100mn Optimus units a year**. For reference, the Auto industry is roughly a 100mn vehicles per year. And we could make one for a cost of maybe, at really high scale, of about **$10,000**. It's smaller, it'd be less expensive than a car. If you sell it for $20,000 or something, Tesla would basically make about **$1 trillion of profit** a year from that. If the P/E multiple is 20x or 25x, that would mean a **$20 trillion market cap** from Optimus alone. And probably $5 trillion to $10 trillion from autonomous vehicles. we have **two Optimus robots** in our **Fremont factory** that are doing basically this task, which is taking cells off the end of the line and placing them in a shipping container. And yes, we actually have quite a few of these cruising around our offices in Palo Alto. I think we've **one major hardware revision**, which should be done **by end of this year or early next**, and then we'll move into a **limited production next year** of Optimus, limited production for use in our factories where we'll test out the product. My prediction is **next year** we'll **have over a thousand**, maybe **a few thousand Optimus robots** working at Tesla. And things are going to scale up very rapidly from there. And Tesla is going to be by far the leader in that. I think it's actually very challenging to do Optimus as a robot startup, because what we found to make Optimus work, we've had to design from first principles, from scratch, every part of the robot (motor, gearbox, sensors, power electronics, communication system). We found that there's basically no supply chain. Our next generation has **22 degrees of freedom**. It will be able to play the piano.
4/23/2024	Tesla 1Q24 result	We do think we will have Optimus in **limited production** in the factory doing useful tasks **before the end of this year**. And then I think we may be able to **sell it externally by the end of next year**. These are just guesses.
1/24/2024	Tesla 4Q23 result	The **car is just a robot on four wheels**. Tesla is arguably already the biggest robot maker in the world. It's just a four-wheeled robot. So Optimus is a humanoid robot with arms and legs. I think we've got a good chance of **shipping some number of Optimus units next year**. This is a brand new product. It's obviously impossible to make a precise prediction.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Global humanoid robot market forecast

We upgrade our global humanoid robot market forecast

For detailed information of the global humanoid robot market, please refer to our sector report: Humanoid Robot (III): Six visions for 2026 – Scaling, iterating and diversifying - 6 Mar 2026

We now project **global humanoid robot shipments to approach ~80,000 units in 2026E**, higher than our previous forecast of ~50,000 units as development in China outpaced our expectations. We expect **China** to remain the largest humanoid robot market, contributing ~70,000 units in 2026E. In the long term, we anticipate total shipments from the US will gradually converge with those from China, whilst shipments from other regions—including Europe, Japan, and South Korea—are also expected to increase, driven by the "local-for-local" demand.

We also upgrade our outer-year projections. We now forecast the global humanoid robot market to reach **1mn units/US$25bn by 2030E** (from 700k units previously) and **100mn units/US$1.5tn by 2050E** (from 70mn units previously).

Global humanoid robot shipment forecast (unit) – including bipedal and wheeled humanoid robots

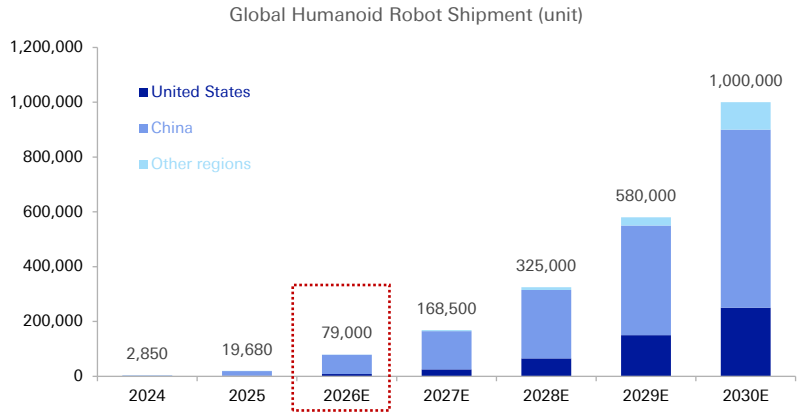
Global Humanoid Robot Shipment	2024	2025	2026E	2027E	2028E	2029E	2030E	2035E	2040E	2050E	2025-30E CAGR	2030E-35E CAGR	2035E-40E CAGR	2040E-50E CAGR
United States														
Tesla	100	1,000	5,000	20,000	50,000	100,000	150,000	1,500,000			172%	58%		
Figure	50	150	Co (Jan 2025): Potential to ship 100,000 units over the next four years											
Agility	50	150	Co (Jul 2026): Cost to US$30k per unit when reaching 10k units p.a.											
Boston Dynamics	50	80	Co (Jan 2026): 30k units o.a.by 2028, tens of thousands p.a. by 2030											
1X		100	Co (Dec 2025): Up to 10k units in 2026-30 to EQT's portfolio companies											
Others	50	300												
US total	**300**	**1,780**	**8,000**	**25,000**	**65,000**	**150,000**	**250,000**	**2,000,000**	**10,000,000**	**40,000,000**	**169%**	**52%**	**38%**	**15%**
YoY growth/ CAGR		**493%**	**349%**	**213%**	**160%**	**131%**	**67%**	**52%**	**38%**	**15%**				
% of global	**11%**	**9%**	**10%**	**15%**	**20%**	**26%**	**25%**	**33%**	**45%**	**40%**				
China														
Unitree (宇树)	1,400	5,500		Co: Target 10k-20k bipedal units in 2026										
AGIBOT (智元)	600	5,100		Co: Target 20k-40k units in 2026										
UBTECH (优必选)	250	1,000	Co: Target >10k units in 2026-2027; prepare for 1mn+ units from 2028											
Others	200	6,000												
China total	**2,450**	**17,600**	**70,000**	**140,000**	**250,000**	**400,000**	**650,000**	**3,000,000**	**10,000,000**	**40,000,000**	**106%**	**36%**	**27%**	**15%**
YoY growth/ CAGR		**618%**	**298%**	**100%**	**79%**	**60%**	**63%**	**36%**	**27%**	**15%**				
% of global	**86%**	**89%**	**89%**	**83%**	**77%**	**69%**	**65%**	**50%**	**45%**	**40%**				
Other regions														
Other regions total (Europe, Japan, etc.)	**100**	**300**	**1,000**	**3,500**	**10,000**	**30,000**	**100,000**	**1,000,000**	**2,000,000**	**20,000,000**	**220%**	**58%**	**15%**	**26%**
YoY growth/ CAGR		**200%**	**233%**	**250%**	**186%**	**200%**	**233%**	**58%**	**15%**	**26%**				
% of global	**4%**	**2%**	**1%**	**2%**	**3%**	**5%**	**10%**	**17%**	**9%**	**20%**				
Global Humanoid Robot Shipment (unit)	**2,850**	**19,680**	**79,000**	**168,500**	**325,000**	**580,000**	**1,000,000**	**6,000,000**	**22,000,000**	**100,000,000**	**119%**	**43%**	**30%**	**16%**
YoY growth/ CAGR		**591%**	**301%**	**113%**	**93%**	**78%**	**72%**	**43%**	**30%**	**16%**				

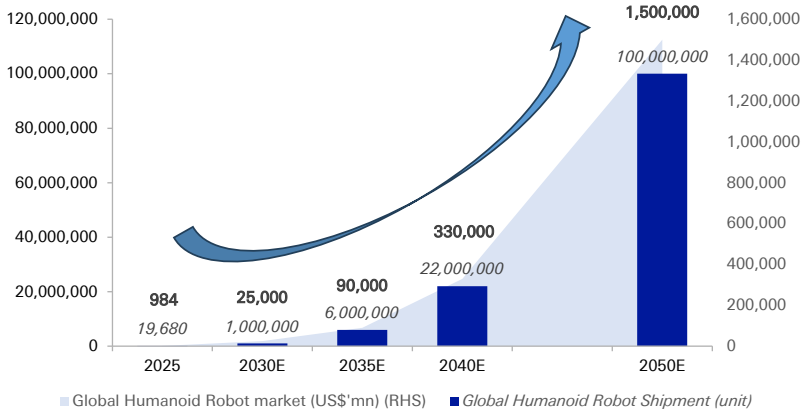
Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank estimates, IDC, Omdia, company data

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Global humanoid robot shipment (unit): We forecast to approach ~80,000 units in 2026E, and to approach 100mn units by 2050E





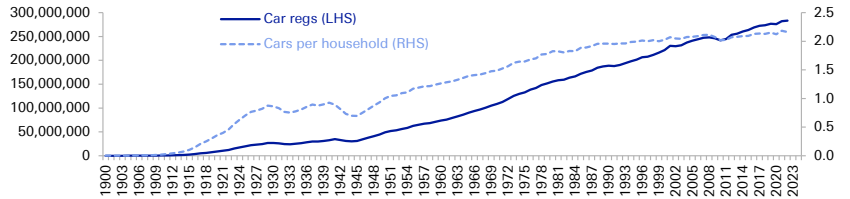
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Drivers behind our humanoid adoption curve and penetration assumptions

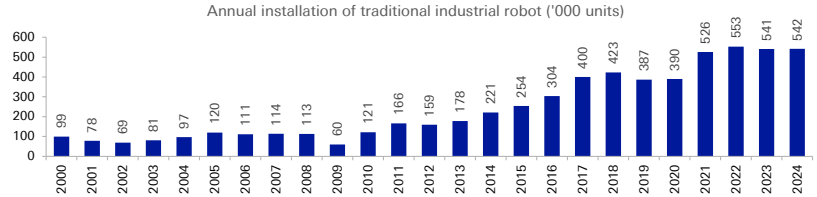
Humanoid penetration vs automobile and traditional industrial robots

	China	US	Europe	Total (Global for industrial robot)
Reference: Passenger vehicle (PV) (2025)				
Passenger vehicle stock unit (mn)	366	283	270	919
PV penetration of households	*71%*	*210%*	*133%*	*108%*
Passenger vehicle sales unit (mn)	30	16	17	63
Stock-to-sales ratio	*12.2x*	*17.3x*	*15.9x*	*14.5x*
Reference: Industrial robot (2024) from IFR				
Industrial robot stock unit ('000)	2,000	410	800	4,720
Industrial robot penetration/ robot density	*4.7%*	*3.1%*	*2.3%*	*1.3%*
Industrial robot sales unit ('000)	295	34	85	542
Stock-to-sales ratio	*6.8x*	*12.1x*	*9.4x*	*8.7x*
Reference: Salary (US$)	**Yearly (US$)**	**Per hour (US$)**	**Per hour (US$)**	
Manufacturing	15,821	35-36	24	
Hospitality	8,699	22-23	18	
Commercial	18,907	Retail: 25-26 Wholesale: 38-39	23	
Transportation & Warehousing	18,660	31-32	21	
Humanoid robot market potential by 2050				
1) Manufacturing				
Manufacturing labour (mn)	37	13	30	80
Humanoid penetration %	*70%*	*80%*	*60%*	*68%*
Humanoids stock unit (mn)	25.8	10.1	18.2	54
Humanoids annual sales unit (mn)	3.2	1.3	2.3	6.8
2) Transportation & Warehousing				
Transportation & Warehousing labour (mn)	8	7	11	25
Humanoid penetration %	*70%*	*80%*	*60%*	*68%*
Humanoids stock unit (mn)	5.4	5.2	6.5	17
Humanoids annual sales unit (mn)	0.7	0.7	0.8	2.1
3) Hospitality & Commercial				
Hospitality & Commercial labour (mn)	11	38	35	84
Humanoid penetration %	*50%*	*50%*	*40%*	*46%*
Humanoids stock unit (mn)	5.3	19.2	14.1	39
Humanoids annual sales unit (mn)	0.7	2.4	1.8	4.8
4) Households				
No of households (mn)	515	135	203	852
Humanoid penetration %	*60%*	*90%*	*50%*	*62%*
Humanoids stock unit (mn)	309	121	102	532
Humanoids annual sales unit (mn)	39	15	13	66
Humanoids total stock unit (mn)	**345**	**156**	**140**	**641**
Humanoids annual sales unit (mn)	**43**	**19**	**18**	**80**
Stock-to-sales ratio	*8.0x*	*8.0x*	*8.0x*	*8.0x*

Automobile adoption in the US during early 1900s was surprisingly rapid

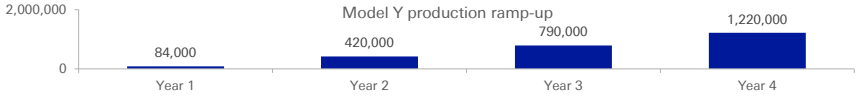


The adoption curve of traditional industrial robot was slow during 2000-10 but accelerated post 2009; China was the main growth driver



Number of employees at Tesla's factories globally and ramp-up of Model Y

	Berlin	Fremont	Austin	Nevada	Shanghai	Total
Tesla Gigafactory employee numbers (DBe)	10,715	20,600	19,312	12,000	20,125	**82,752**



Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Source: Deutsche Bank estimates, National Bureau of Statistics, US Bureau of Labour Statistics, Eurostat, IFR, US Federal Highway Administration (FHWA), company data



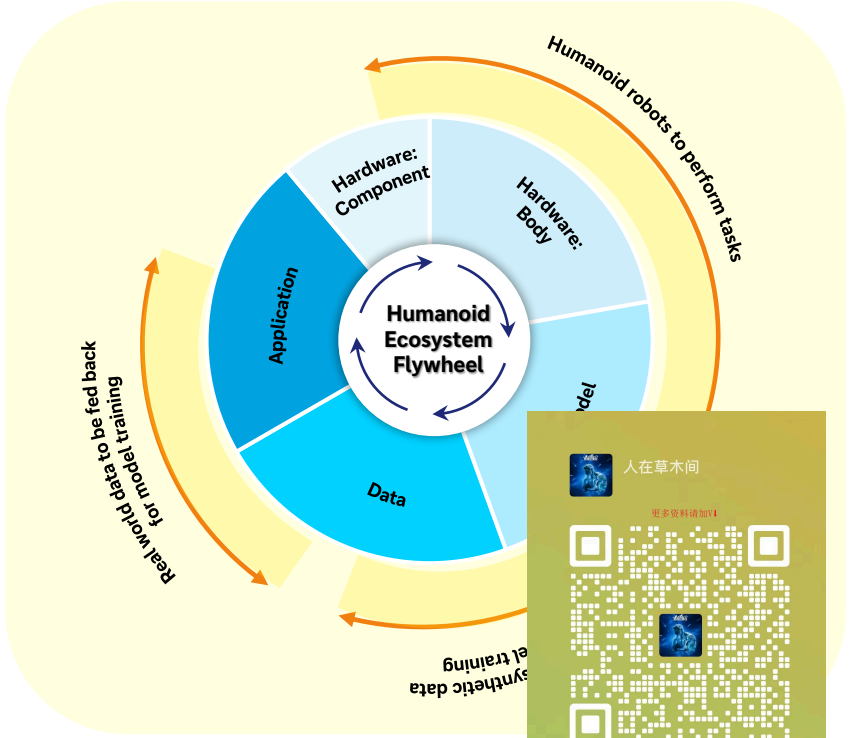
Ecosystem flywheel spinning

Ecosystem flywheel spinning

We believe the **ecosystem flywheel** for humanoid robots comprises:

- **Hardware (component and body):** This serves as the foundation, as humanoid robots "feel" the environment via various sensors (vision, tactile, etc.) and perform tasks in a physical form;
- **Model:** This is often referred to as the "brain" of the humanoid. Currently, the common practice is for the **Vision-Language-Action (VLA) model** to addresses the relationships between semantic understanding and action mapping, the **World Model** to enable environment simulation and future prediction, whilst **Reinforcement Learning** to drive action strategy optimisation through trial-and-error. One expert we spoke with suggests that he believes the VLA model might not be the end game as it struggles with long-term and complex work (link to report).
- **Data:** Both **real world data** and **synthetic data** are used for model training. To generate larger datasets in accordance with the data scaling law, the Chinese government has funded several data collection centres to scale up these efforts. To mitigate the cost of real world data, some companies are adopting **egocentric** and Universal Manipulation Interface (**UMI**) data.
- **Application:** Real-life application of humanoid robots currently concentrate in performance, robot-humanoid interaction in commercial settings, and simple tasks (grasping, picking, etc.) in warehouses and factories. The real-life data generated could be fed back for model training to improve success rate.

Ecosystem flywheel = Body + Model + Data + Application



Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Ecosystem flywheel spinning

In **China**, several players have already achieved a closed-loop ecosystem flywheel, led by **Unitree**, **AGIBOT**, and **UBTECH**, in our view. This signifies that these companies possess comprehensive capabilities spanning hardware (both components and humanoid robot bodies), models, data, and applications.

For model-oriented start-ups such as **Galbot, GALAXEA, X Square, Spirit AI, and AI² Robotics**, business models are complemented by certain level of hardware capabilities. This contrasts with tech conglomerates like **Alibaba**, **Huawei** and **ByteDance**, which have so far focused only on models.

Meanwhile, **LinkerBot** and **Sharpa** specialise in dexterous hands, whilst **PaXini** focuses on tactile sensors.

Additionally, automotive and home appliance manufacturers have also launched humanoid robot-related products and models.

Company	Hardware: Component	Hardware: Body	Model	Data	Research platform	Application
Mainland China						
Independent Vendors						
Unitree (宇树)	Camera, LiDAR, Dexterous hand, etc.	Has self owned factories	UnifoLM-VLA-0, UnifoLM-WMA-0, etc.	UnifoLM-WBT-Dataset		Mainly research & education
AGIBOT (智元)	Actuator, Dexterous hand, etc.	Factory in Shanghai	Genie Operator-2; WITA-Omni, etc.	AGIBOT WORLD, Maniformer (觅蜂科技)	Genie Studio	To B (autos, etc.) & To C (education etc.)
UBTECH (优必选)	Actuator, etc.		Thinker-WM; Thinker-VLA; Thinker	Real-world data		To B (autos, logistics) & To C (education etc.)
Galbot (银河通用)		Joint-venture (with MIRACLE LOGISTICS, etc.)	AstraBrain; AstraBrain-WBC0.5; LDA-1B, etc.	Synthetic data; DexonomySim - Dataset		To B (CATL etc.) & To C (retail, pharmacy)
Leju Robotics (乐聚)		Joint-venture (with Dongfang Precision)	Huawei (Pangu), Ant (LingBot)	OpenLET-Dataset		To B (auto etc.) & To C (education)
GALAXEA (星海图)			Fast-WAM, VLA-G0.5, VLA/VLM-G0, etc.	Galaxea Open-World Dataset		To B
X Square Robot (自变量)	Dexterous hand		WALL-B, WALL-OSS, WALL-A, etc.	G0-Dataset; QUANXTA Zero Series UMI		To C (cleaning, etc.)
Spirit AI (千寻智能)			VLA-Spirit v1.6, Spirit v1.5, etc.			To B (JD, etc.)
AI² Robotics (智平方)	Actuator, etc.		NeuroVLA,Video2Actm, FiS-VLA, RoboMamba		AlphaBrain Platform	To B (electronics, etc.)
LinkerBot (灵心巧手)	Dexterous hand, Arm, Teleoperation		Linker Genesis	Open TeleDex + DexSkillNet		To B
Sharpa	Dexterous hand (adopted by Unitree), Arm		FTP-1, VTLA - CraftNet			To B (NVIDIA, etc.)
PaXini Tech (帕西尼感知)	Dexterous hand, Sensor GEN3		VTLA - OmniVTLA	OmniSharing DB dataset		To B (auto etc.)
Electronic manufacturers						
Honor						
Automotive & Home appliance manufacturers						
XPeng	Chips, etc.	To mass produce in late 2026	VLA model			Own factories; Store guide
Xiaomi			Xiaomi-Robotics-1, MiMo-Embodied	Xiaomi-Robotics-U0, generating synthetic data		In own factories
AI platforms (Models) companies						
Alibaba			Qwen-Robot series		Alibaba Cloud-AnalyticDB embodied AI platform	
Huawei			CloudRobo: CR-VLA-Dual & Lerobot-ACT/$\pi_{0.5}$	CloudRobo-dataset	CloudRobo	
Bytedance			VLA Seed GR-3			
iFLYTEK - iFLY-AIBOT	Robobrain integrated circuit & sensors	Guide01	iFlyBot-VLM & iFlyBot-VLA			

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Source: Deutsche Bank, company data

Ecosystem lywheel spinning

In **the US**, **Tesla** possesses capabilities spanning hardware, model, and real-world application, with plans to deploy its Optimus humanoids within its own actories and Optimus Academy or data collection soon. In comparison, **Boston Dynamics** (owned by Hyundai Motor) and **Apptronik** ocus primarily on hardware whilst partnering with **Google DeepMind** or model capabilities. There are also several prominent platform - and model-only companies, such as **NVIDIA**, **Google**, **Physical Intelligence**, and **Skild AI**, that operate without a hardware ootprint.

In **Europe**, we believe most companies tilt towards hardware whilst also maintaining in-house AI model capabilities, as seen with **NEURA, Agile and Humanoid**. Many o these players leverage NVIDIA's research platforms to accelerate their development.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Valuation from previous funding rounds



Companies with model capability tend to obtain higher valuation; US and European humanoid names on higher valuation than Chinese peers

Company	Latest valuation (based on public news)	Latest funding	Completion date / Status	2025 Revenue	2025 Recurring Net Profit	2025 Recurring NPM
China						
Unitree Robotics (宇树科技)	IPO valuation: RMB60.99bn (Updated in Aug 2026)	IPO in progress: RMB6.099bn	IPO in progress (to complete in Aug 2026)	RMB1.7bn 1H26: RMB1.05-1.13bn	RMB591mn 1H26: RMB236-283mn	35% 1H26: 22%-25%
Leju Robots (乐聚机器人)	Post pre-IPO round valuation: RMB4.327bn (Updated in May 2026)	IPO in progress: RMB2.6bn	IPO in progress	RMB258mn	RMB-78mn	-30%
DEEP Robotics (云深处)	IPO valuation: RMB13.9bn (Uptated in May 2026)	IPO in progress: RMB2.5bn	IPO in progress	RMB337mn	RMB15n	4%
Galbot (银河通用)	US$3bn	RMB2.5bn	Mar 2026			
Spirit AI (千寻智能)	RMB20bn	A+ round: RMB1.5bn	Jun 2026			
X Square (自变量机器人)	RMB20bn	C round: amount not disclosed	Jun 2026			
AI^2 Robotics (智平方)	RMB20bn	RMB5bn	Jun 2026			
LinkerBot (灵心巧手)	US$3bn (seeking US$6bn valuation in the next financing round)	B+ round: amount not disclosed	Apr 2026	RMB250mn		
Galaxea AI (星海图)	RMB20bn	B+ round: RMB2bn	Apr 2026			
Sudo AI (苏度科技)	Over US$2bn	Pre-A round: US$500mn	Apr 2026			
EngineAI (众擎机器人)	RMB10bn	B+ round: amount not disclosed	May 2026			
U.S.						
Figure AI	Post-money valuation: US$39bn	C round: over US$1bn	Sep 2025			
Skild AI	Over US$14bn	C round: US$1.4bn	Jan 2026			
Physical Intelligence	Over US$11bn (Updated in Mar 2026)	Reportedly in talks to raise about US$1bn in new funding	Ongoing			
Apptronik	US$5.5bn	A-X round: US$520mn	Feb 2026			
Agility	Pre-money IPO valuation: US$2.5bn (Updated in Jun 2026)	IPO in progress: US$620mn	IPO in progress through SPAC			
Europe						
1X	US$10bn (Updated in Sep 2025)	Seeking up to US$1bn in new funding	Ongoing			
NEURA	US$7bn	C round: US$1.4bn	Jun 2026			
Humanoid	US$1.35bn	A round: US$152mn	Jul 2026			

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Source: Deutsche Bank, Sina, Yahoo, STCN, The Robot Report, OFWEEK, Ventureburn, Oodaloop. Tencent, Eastmoney, Zhidongxi, Bloomberg Finance LP, company data



Real-life applications and success rate

Real-life applications and success rate

For details, please refer to our report: Rise of Humanoid Robots (IV): Takeaways from a Chinese humanoid robot expert – 28 Jul 2026

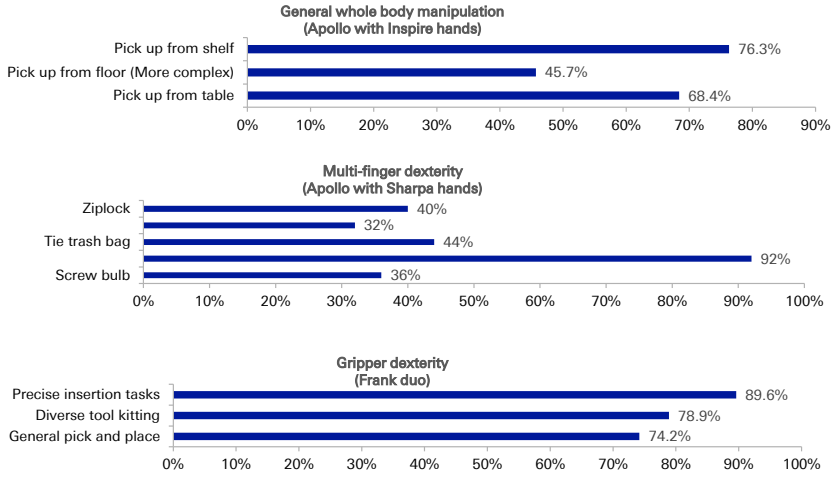
Based on our conversations with industry experts, humanoid robots already present **a viable business case for entertainment performances and academic research scenarios**. However, humanoids are **not yet commercially viable for industrial applications** when compared with traditional industrial robots. The **payback period for humanoids is mostly two years or more**, longer than that of traditional industrial robots at <1 year. **Task success rates also vary widely**: for a single, short, and simple task (such as picking), the rate can exceed 99%; for proof-of-concept (POC) projects, the rate typically ranges from 80% to 90%; whilst for long-duration tasks, the success rate can fall below 50%.

This variation suggests scope for operational improvement before humanoids achieve commercial viability on factory floors. Meanwhile, some industry experts remain optimistic, believing the industry **could reach a commercial breakthrough point by 2027–2028 (i.e. before 2030)**, driven by (1) the continuous scaling of data, (2) ongoing model evolution and (3) lowering costs.

Commercial viability for humanoid robots

Real-world applications for humanoids	Commercially viable or not?
Performance and human-robot interaction	√ (e.g. Entertainment interactions)
Research and Education	√ (e.g. Universities dedicated budgets)
Industrial & Warehouse	**?** (potential but need to improve)
Consumer	**?** (may take 5-10 years)

Success rate by Gemini Robotics 2 (released on 30 July 2026)



Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, Google DeepMind

Livestreaming of humanoids working in factories by Figure and AGIBOT

Livestreaming by Figure AI:

In **May 2026,** Figure AI completed a **200-hour livestream**, demonstrating three Figure 03 humanoid robots sorting packages in a warehouse. The mission involved detecting package barcodes, picking up the packages, and then placing them on a conveyor belt with the barcode face down.

Throughout the livestream, the robots processed ~250,000 packages **without experiencing hardware failure**. While occasional issues such as dropped or incorrectly oriented packages occurred, Figure AI classified these as package handling errors, not robot malfunctions.

According to Figure AI's CEO Brett Adcock, Figure 03 match human speed on this sorting task, achieving **less than 3 seconds per package.**

Livestreaming by AGIBOT:

1) In **April 2026,** AGIBOT hosted an **8-hour livestream** of tablet production line operations at Longcheer's Nanchang factory. According to AGIBOT, Genie G2 completed 2,283 tasks with **a 100% success rate.**

2) In **June 2026,** AGIBOT hosted a **6-day livestream** at the same factory. Genie G2 worked 11 hours daily (from 8am to 7pm).

Compared to April demo:

- Robot deployment doubled from 4 to **8 units**.
- The June demo covered the **entire tablet quality inspection process**, versus a single step in April.
- The June demo showed proving robust reliability. Despite a much higher workload with 17,625 units produced and 64,828 operations in June demo, it maintained **a 99.99% success rate**.
- AGIBOT disclosed that its humanoid has **operated stably for 106 days** (3.16 – 6.28) at the Longcheer's Nanchang factory.
- AGIBOT also disclosed that its humanoid achieves **2mm precision** and **a 22-second cycle time** (节拍/ time needed to complete one task).

AGIBOT humanoid robots Genie G2 operate in Longcheer's Nanchang factory in China



Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Source: Company data, Deutsche Bank, Sina news



US bans foreign-produced advanced robotic devices

US bans foreign-produced advanced robotic devices – Scope broader than humanoids

For detailed information, please refer to our report: Humanoid Robot: US bans foreign-made robotics (humanoid, quadruped, mobile robots) – 29 July

On 28 July 2026 US time, the Federal Communications Commission (FCC) updated its Covered List to include **foreign-produced advanced robotic devices and connected power inverters**, due to the supply chain and cybersecurity risks.

Highlights from the policy:

- **Scope:** The policy states that advanced robotic devices refer to mechanical mobile devices, including autonomous mobile robots (AMRs), humanoid robots and quadrupeds. We understand that robotic devices capable of movement and equipped with certain sensors (such as LiDAR, electro-optical/infrared, acoustic, and thermal sensors) collecting data on their surroundings are classified as advanced robotic devices. We understand that traditional industrial robots are not affected by this policy, as they are stationary and non-mobile.
- **Nation:** The policy states that the foreign-made products include products regardless of the nationality of origin (does not single out China).
- **Exclusions:** The policy does not affect FCC previously authorized or previously purchased existing models of advanced robotic devices. However, the FCC has the authority to revoke authorizations, according to Reuters.
- **Risks for the ban to extend to robotic components:** The policy does not explicitly ban robotic components, but has mentioned the "vulnerability" of US national security from "advanced robotic devices and their critical components" when they are sourced from foreign countries.

We believe the ban is somewhat expected, as the Trump administration has been tightening its grip on the robotics sector since 2H25 *(See the U.S. policy tracker on next page).* **Yet, the broad scope of mobile robots covered by the policy and the rapid announcement surprised us.**

Ways to circumvent the ban:

- **Exemptions:** Reuters (link) learnt from their sources that non-Chinese suppliers could obtain exemptions from the restrictions, similar to recent drone and router bans. As of 29 July, the FCC has granted exemptions for products from 17/17 companies affected by the Dec 2025/ Mar 2026 foreign drone/router restrictions, all of which are non-Chinese companies.
- **Expand production capacity in the US:** We believe non-Chinese robotics/component manufacturers may ramp up US production capacity to mitigate risks. For example, FANUC, Yaskawa and Harmonic Drive Systems in our coverage are all expanding their U.S. capacities.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, White House, FCC

US bans foreign-produced advanced robotic devices – FCC Covered List details

US FCC Covered list primarily consists Chinese communications equipment and services companies

US FCC Covered List		
Company	**Details**	**Date of Inclusion to Covered List**
Huawei (China)	Telecommunications equipment	Mar 21
ZTE (China)	Telecommunications equipment	Mar 21
Hytera (China)	Video surveillance and telecommunications equipment	Mar 21
Hangzhou Hikvision (China)	Video surveillance and telecommunications equipment	Mar 21
Dahua (China)	Video surveillance and telecommunications equipment	Mar 21
AO Kaspersky Lab (Russia)	Information security products, solutions, and services	Mar 22
China Mobile (China)	International telecommunications services	Mar 22
China Telecom (China)	Telecommunications services	Mar 22
Pacific Networks (China)	International telecommunications services	Sept 22
China Unicom (China)	International telecommunications services	Sept 22
Kaspersky Lab (Russia)	Cybersecurity and anti-virus software	July 24
Digitalsystem Technology (China)	International telecommunications services	July 26
Product category	**Details**	**Date of Inclusion to Covered List**
Uncrewed aircraft systems	Subject to exemptions: **(a)** included on the Defense Contract Management Agency's Blue UAS Cleared List. **(b)** qualify as "domestic end products" under the Buy American Standard. **(c)** gain approval from DoW or DHS. **(d)** foreign-produced "Toy Drones".	Dec 25
Routers	Subject to exemptions: Gain approval from DoW or DHS	Mar 26
Foreign-produced power inverters	Subject to exemptions: Gain approval from DoW or DHS	July 26
Foreign-produced advanced robotic devices	Subject to exemptions: Gain approval from DoW or DHS	July 26

All cases cited in the FCC' Public Notice as reasons for the ban are related to Chinese companies

Case	Key points
"Supply chain vulnerability"	
The Wall Street Journal. "Under the Skin of America's Humanoid Robots: Chinese Technology." April 2026.	Tesla and others **turn to suppliers in China for components in an industry** seen as strategic by Washington and Beijing
"Unacceptable cybersecurity and safety risk" of foreign-produced advanced robotics	
The Guardian. "The accidental hacker: how one man gained control of 7,000 robots." February 2026.	Someone used Claude Code to reverse-engineer **DJI's remote cloud servers accessing datge from other robot vacuum cleaners**.
IEEE Spectrum. "Exploit Allows for Takeover of Fleets of Unitree Robots." September 2025.	A critical vulnerability in the Bluetooth Low Energy Wi-Fi configuration interface used by **Unitree's Go2 and B2 quadrupeds and G1 and H1 humanoids** can result in a root-level takeover by an attacker.
Axios. "Chinese robotics manufacturer left backdoor in product." April 2025.	China-based manufacturer **Unitree Robotics pre-installed a backdoor on its Go1** robot dogs that allowed anyone to surveil customers around the world.
"Unacceptable cybersecurity and safety risk" of high fidelity sensors	
Foundation for Defense of Democracies. "Laser Focus: Countering China's LiDAR Threat to U.S. Critical Infrastructure and Military Systems." December 2024.	**As China seeks to expand its influence over LiDAR supply chains,** the United States must implement robust policies to secure their own LiDAR capabilities and protect against foreign exploitation.
The Australian Strategic Policy Institute. "China's vulnerability disclosure regulations put state security first." August 2021.	On 1 September 2021, new regulations will come into effect in **China that tighten the requirements** for reporting security vulnerabilities in network products.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, White House, FCC

US bans foreign-produced advanced robotic devices – US tightening grip

The U.S. initiated a Section 232 investigation of robotics and industrial machinery imports **in September 2025**. Subsequently, **several acts** prohibiting humanoid robot imports, specifically from China, have been proposed. **In February 2026**, Chinese humanoid robot maker **Unitree** was added to the U.S. Department of Defense (DoD)'s Chinese Military Companies List (CMC List).

US policies on robotics

Policy	Date	Topic	Details
Robot related policies or events			
Covered List updated	July 2026	Advanced robotic devices	The Federal Communication Commission (FCC) updated its Covered List to include **foreign-produced advanced robotic devices (namely mobile robots including humanoid and quadruped robots)** as well as power inverters seeking to curb national security risks and fuel onshoring.
Closed-door meeting	Jun 2026	Robotics	**U.S. Commerce Secretary Howard Lutnick** stated that his department is studying **Chinese state-subsidized robotics imports** and signaled the administration could take action once the review is complete.
The GUARD Act	Proposed in Jun 2026	Humanoid robot	A bipartisan group of lawmakers introduced legislation to scrutinize and potentially ban the importation of robots made in China. It would require national security agencies to begin a review process for any **humanoid and quadruped robots made by China** or other countries.
American Security Robotics Act	Mar 2026	Humanoid robot	Suggested to prohibit the federal government from procuring and operating **unmanned ground vehicle systems manufactured by foreign entities of concern (especially China)**, including **humanoid robots and autonomous patrol terchnology**.
Chinese Military Companies List	Updated in Feb 2026	Humanoid robot	The US Department of Defense (DoD) has updated its **Chinese Military Companies List** (CMC List), adding robot company **Unitree robotics** to the "blacklist".
Executive Order	Potential release in 2026	Robotics	On 3 December, news reported that the Trump administration is actively drafting **a new executive order focused on robotics policy**, with **a potential release planned for 2026**. The administration is framing this as a move to **bolster domestic manufacturing**, with Commerce Secretary Howard Lutnick meeting with industry CEOs to shape a strategy that prioritizes **industrial and defense applications**, aiming to "remove sand from the gears" of innovation.
Department of Transportation	By end of 2026	Robotics/ Autonomous technologies	Reportedly to form **a robotics working group**, to be announced as part of a broader federal robotics effort to accelerate the deployment of **autonomous technologies**. This initiative aims to strengthen competitiveness in critical sectors, with a focus on integrating robotic systems into transportation infrastructure and enhancing AI-driven operations.
National Commission on Robotics Act	Proposed in Feb 2026	Robotics	Proposed to establish a national commission to evaluate **U.S. competitiveness in robotics** and provide policy recommendations
Humanoid ROBOT Act of 2025	Proposed in Nov 2025	Robotics	Suggested to **prohibit** the federal government from **acquiring humanoid robots** with integrated artificial intelligence **from foreign entities**, including military suppliers from China, Iran, North Korea, and Russia
Section 232 investigation	Sep 2025	Robotics	News reported that the US Department of Commerce Bureau of Industry and Security (BIS) announced the initiation of an investigation into the effects on US national security of **imports of robotics and industrial machinery**. The investigation could result in the **imposition of tariffs or other import restrictions** by Spring 2026.
Tax and reconciliation package			
One Big Beautiful Bill Act (OBBBA)	Signed into law in Jul 2025	Bonus depreciation	Permanently restored 100% bonus depreciation for qualified property acquired and placed in service after Jan. 19, 2025 (Before: only 40% deduction in the first year). This is intended to encourage investment and reduce taxable income in periods of high investment.
		Manufacturing facilities transformation	Any project started before January 1, 2029, now qualifies for 100% expensing (Before: depreciated over 39 years). That includes full builds of **production facilities or expansions designed to support robotics**.
		Section 179 expensing	Section 179 lets businesses immediately **deduct the full purchase price of qualifying equipment, including industrial robots**, when it's put into use the same year, with deduction limit increased to US$2.5mn (Before: US$1.25mn)
		R&D expensing	Restored full immediate expensing for **domestic research and development** costs starting in 2025 (Before: amortized over 5 years or 15 years for foreign R&D)
AI related policies			
Executive Order - 14365	Dec 2025	Ensuring a National Policy Framework for Artificial Intelligence	Established a federal policy aimed at addressing the growing number of **state-level AI regulations** governing the AI ecosystem: "to sustain and enhance the U.S.' global AI dominance through a **minimally burdensome national policy framework** for AI"
Executive Order	Nov 2025	Genesis Mission	The Department of Energy (DOE) will take a central leadership role in developing **an integrated AI platform** that brings together federal computing, data, and research resources to speed AI-enabled scientific innovation
Executive Order - 14179	Jan 2025	Removing Barriers to American Leadership in Artificial Intelligence	Outlined a **blueprint for AI strategy** aimed at accelerating Innovation, building U.S. AI Infrastructure, and leading in International Diplomacy & Security

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, White House, FCC

US bans foreign-produced advanced robotic devices – Responses from Unitree & Geekplus

Unitree: The company states that its marketed main product models (humanoid robots G1, H2, R1, as well as quadruped robots Go2, B2, A2), all have obtained FCC certification. Therefore, changes in U.S. policies **does not affect the continued sales of Untree's existing main products** in the US market. However, newly developed robot models, unless granted specific exemptions, will face the risk of being unable to be sold in the US market due to the failure to obtain FCC certification.

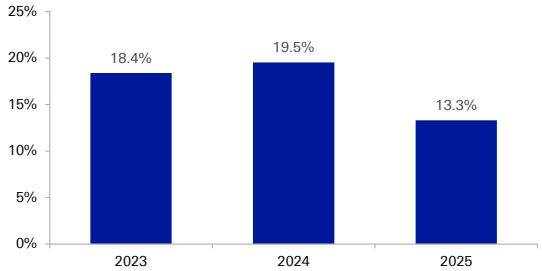
In the future, if the FCC further tightens regulatory policies, such as revoking the certification of the company's currently marketed products or expanding the regulatory scope to include previously certified robot products, the company will face the risk that its currently marketed models will also be unable to be sold in the U.S. market.

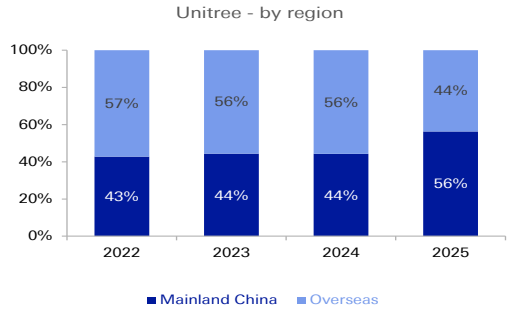
Unitree generated 13% of its revenue from the US market in 2025.

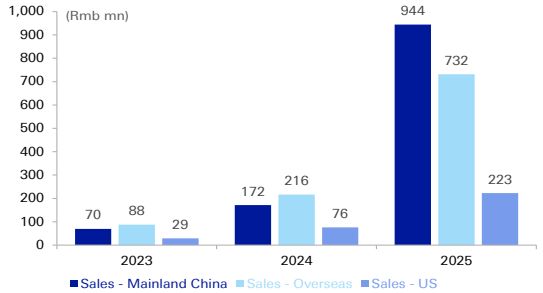
Geekplus: The company states (link) that all Autonomous Mobile Robot (AMR) models currently sold by the Group in the US have obtained valid FCC certifications and therefore are not subject to the Prohibitions. Sales, product delivery, and business operations of the Group in the US remain fully operational and completely unaffected. The Prohibition will not have any material adverse impact on the business, operation or financial conditions of the Group.

Geekplus announced that the Company's **new manufacturing facility in the US** will commence operation in due course.

Unitree generated 13% of its revenue from the US market in 2025







Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com
Source: Deutsche Bank, company data

US bans foreign-made robotics – Positive for US; Neutral for Japan; Mixed for China

For detailed information of the global humanoid robot market, please refer to our sector report: Humanoid Robot: US bans foreign-made robotics (humanoid, quadruped, mobile robots) – 29 July

For US– Covered by Edison Yu:

- **Positive for domestic robotic manufacturers:** The policy aligns well with the "reindustrialization" theme. **We anticipate that U.S. humanoid robot developers such as Tesla (Optimus), Figure AI, Boston Dynamics, and Agility Robotics will benefit from extended development and scaling opportunities.**

For Japan – Covered by Iris Zheng:

- **Neutral for traditional industrial robot manufacturers:** We understand that traditional industrial robots are not affected by this policy, as they are stationary and non-mobile. Consequently, we anticipate **a neutral impact for traditional industrial robot manufacturers under our coverage, including FANUC and Yaskawa**. Both companies are currently expanding their production capabilities within the U.S.
- **Slightly positive for robotic component suppliers with US factories:** We believe the heightened political sensitivity could **benefit Japanese component manufacturers, such as Harmonic Drive Systems, relative to their Chinese competitors**. While HDS' factories are primarily located in Japan, the company also has a presence in the U.S. and is expanding its capacity in that region.

For China – Covered by Iris Zheng

- **Negative for mobile robotic manufacturers:** **We believe this policy places pressure on Chinese mobile robotic manufacturers, such as Geekplus** (which is under our coverage), and **humanoid robot manufacturers**, given that the U.S. represents an attractive market with higher margins. While the policy does not affect existing models, it poses risks for future models seeking to enter the U.S. market.
- **Mixed for robotic component suppliers:** **The current policy does not ban robotic components from Chinese suppliers, thus not imposing an immediate impact. However, the direction of recent policies has led to increasing risks.** Most Chinese suppliers under our coverage, such as Hengli, Shuanghuan, and Sanhua, possess overseas production capacities, and Leaderdrive has been establishing joint ventures with international partners. Chinese suppliers offer low-cost solutions that facilitate broader adoption within the entire robotics ecosystem.

Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

Appendix 1
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Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

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Next to each of the three respective bars showing the proportion of "buy", "sell" and "hold" recommendations we provide two additional bars to show:

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- The proportion of "buy" (or "sell" or "hold) recommendations where Deutsche Bank and or/Affiliates has provided Investment Banking services in the past 12 months for which it has received compensation. The percentage value displayed above the bar shows the proportion of Companies Covered with the stated rating where DB has also provided Investment Banking services in the past 12 months. E.g. 50% above the "Cos. w/ Investment Banking relationship" bar means 50% of the Companies Covered with the rating stated also have an Investment Banking Relationship with DB.

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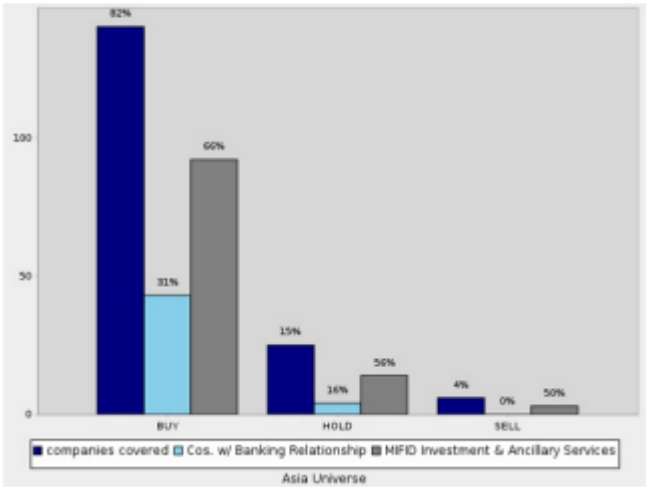
Sell: Based on a current 12-month view of TSR, we recommend that investors sell the stock.

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

TSR = Total Shareholder Return. Percentage change in share price from current price to projected target price plus projected dividend yield

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Equity rating dispersion and banking relationships



Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com

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Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com



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Iris Zheng | (+852) 2203 5884 | iris.zheng@db.com; Edison Yu | (+1) 917 893-2023 | edison.yu@db.com