

How will the future of robots change with the advent of 6G?

6G will make robots smarter, enable teamwork, and allow them to learn continuously.

Why are there so many robots at a mobile phone exhibition? That's probably the question many people ask themselves when visiting the booths at Mobile World Congress (MWC), which showcases technologies expected to shape the next few years.

The simplest answer is that robots always attract attention. A dancing humanoid robot easily draws crowds to its booth. But if you only view robots at MWC as a publicity stunt, you'll miss a larger discussion underway about the future of robotics and networking.

As early as 2026, robots were already making significant strides. Companies like Boston Dynamics and Honor introduced humanoid robots for industrial and home environments. However, there's still a much bigger leap forward, and it depends on **6G** — the next-generation network technology expected to replace 5G around 2030.

At first glance, robots and 6G may seem unrelated. But in the future, 6G will transform robots from independent machines into **a connected robotic ecosystem that continuously learns and senses its environment** .

This shift will begin in industry, then expand to hotels, healthcare, and finally into the home. However, according to experts at MWC, many technological advancements still need to be achieved before that vision becomes a reality.



What will 6G open up for robots?

To understand why 6G is important for robots, we first need to understand the new capabilities this technology offers.

One of the highlights is that 6G can function as a **massive sensor network**. Sensors will be integrated into robots and their surroundings. This allows the 6G network to act like radar, continuously scanning and mapping the environment in real time.

For example, if a robot is moving in a crowded environment, a 6G network can help create a virtual map to allow the robot to safely avoid obstacles.

In addition, it offers extremely fast data transmission speeds. Current 5G networks are not optimally designed for AI, but 6G will provide low latency, high speeds, and lower power consumption. This will help robots process AI data more efficiently in real time.

Currently, some systems use private 5G networks combined with edge AI for temporary processing. However, 6G will help provide more stable connectivity quality on a large scale.

At MWC, Cambridge Consultants demonstrated an autonomous humanoid robot that can pick up and place boxes based on user gestures. The ability to recognize gestures and react in real time requires immense computing power. This model currently uses its own 5G network, but 6G will take this capability to a whole new level.

In the future, robots will not only operate individually but will also work together in teams. For example, in a retail environment, one robot could unload goods from a truck while another robot arranges them on shelves.

To work efficiently, robots need to share information with each other. Robots that sort goods need to know the quantity of incoming goods, while robots that unload goods need to communicate information about the

warehouse status.

This is known as **long-horizon** planning. The robot not only performs its current task but also anticipates its next steps in a constantly changing environment. In a demo at MWC, the robot was able to plan up to 16 steps in advance.

Additionally, robots can also utilize data from other devices. For example, cameras in a store can become an extra pair of 'eyes' for the robot.

Robots in the home will learn continuously.

In the future, you might only own one robot in your home. However, that robot will still be part of a connected ecosystem, similar to phones or cameras today.

Robots will learn from data collected in various places. If a robot learns how to serve coffee in a hotel, that knowledge could be applied in your home.

This ability to learn continuously is one of the biggest challenges for modern robots. Robots need a huge amount of real-world data to learn simple tasks like holding a hot cup of coffee without spilling it or causing harm.

This requires extremely fast data transmission speeds — a feature that 6G can provide.

The robot will also need to learn how to adapt to each family. Every house has a different layout, so the robot needs time to learn the new environment.

Experts believe this is a significant challenge. Even humans sometimes struggle with small changes in the home, so robots will need considerable time to achieve a similar level of flexibility.

6G is not expected to be widely deployed before 2030. In the meantime, companies continue to improve robots using current technology. Robots are being improved in terms of flexibility, grasping ability, and situational awareness. When 6G arrives, these robots will be ready to leverage stronger connectivity to expand their capabilities.

The combination of robots and 6G could usher in an entirely new generation of robotics. However, bringing humanoid robots into the home remains a story for the future — perhaps after 2030, or even later.

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