



## **Cobots - a choice that determines our future**

Initiatives like Digital India, Make in India and Skill India have been devised to harness the vast population's diverse potential in our country. Industry 4.0 solutions are a boon to such initiatives as they provide alternatives to current manual processes through automation. Cobots are a core tenet of Industry 4.0 solutions, and their demand has increased exponentially. This paper views the current state of art applications, business relevance, and challenges that have to be addressed fully to utilise the potential of cobots.

Automation - using machines and applying technology for efficient delivery of products and services - is the need of the hour as businesses strive to reduce operating costs and simultaneously increase output. Robotic technology and AI are the significant drivers for automation.

Cobots, or collaborative robots, are a niche technology that has evolved from conventional industrial robots. They direct human to robot interaction within a shared space or where both humans and robots are in proximity [1]. They are compatible with Industry 4.0 design principles specific to human and robot collaboration, as identified by McKinsey & Company. Cobots collect data for analysis and modeling by other systems and, in turn, promote information transparency. They are tools used by operators rather than as autonomous entities. In short, cobots are Industry 4.0 products that continue to evolve as they are programmable.

## Applications

Cobot applications work differently from industrial robot applications that are isolated from human contact. Several new applications have evolved for cobots to work with humans too. The manufacturing industry, for one, has many use cases as cobots can replace humans for several repetitive tasks like pick and place, packaging, and palletizing, and quality inspection.

There are also several other unique applications for cobots beyond manufacturing. These include handling seedlings, herbs, and other plants in a greenhouse or in a restaurant where cobots can flip burgers and help the

Highly specialized cobots assist surgical procedures. There are situations where processes need to be carried out with high accuracy to minimize the patient's risk. Cobots are better suited for the task than a human hand. Cobots can also be co-pilots where they help human pilots perform to the best of their ability without being overtaxed. Trained, they can again fly a new aircraft quickly [2, 3].

## Advantages

- 1 They can work for long hours with the same efficiency, accuracy, and consistency and minimize human errors.
- 2 Cobots are flexible compared to conventional robots and can be programmed easily and quickly. As a result, they are used across different departments/requirements with new tasks. Enabling a cobot to do the same job for a week or another every day as the situation demands.
- 3 Cobots allow partial and gradual automation of a plant.
- 4 Designed to work with people and not replace them makes the employees happier as they move into a more creative thinking space by handing over mundane jobs to cobots. This can result in increased productivity and process optimization to achieve maximum output at minimum cost.

All in all, cobots can help the business deal with a labor shortage, ensure human safety and keep costs low and ensure a high ROI [4, 5].

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## Challenges

While cobots are attractive at the outset, they too come with fundamental challenges. To better utilize them for maximum output and ROI, we look at some of the top challenges:

**Rigid and unstable cobots:** There is a need to develop cobots that are flexible, less susceptible to damage, and have fewer joints and connecting parts. Soft robotics is an emerging area in this direction.

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**Better power sources:** The need of the hour is to develop new energy sources to power robots for a more extended time with high safety standards. Researchers are currently working on making components of a robot more power efficient. They are also finding ways for robots to operate wirelessly in unstructured environments to extract energy from light, vibrations, and mechanical movement.

**Mapping:** While there is significant progress to robots perceiving and navigating a specific environment, they still need to evolve significantly. Also, cobots need to be able to operate in unmapped and poorly understood territories. They need a significant level of autonomy for complex self-monitoring and self-reconfiguration.

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**Reliable Artificial Intelligence:** We have a long way to go before we can replicate every aspect of human intelligence. AI that can learn complex tasks with minimal training data is also critical. Existing AI is no match for human reasoning – present-day robotic solutions are not foolproof.

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**Privacy, security, and ethics:** There is much confusion on the ownership of data the robot holds – among the end-user, robot manufacturer, or software provider. Also, ensuring the safety of the data is a significant concern with robotic solutions. Similarly, other ethical issues can include sensitive tasks, the responsibility of failure, deskilling of the workforce, and using AI in unethical ways. [6,7]



## Business/ market demand across the globe and in India

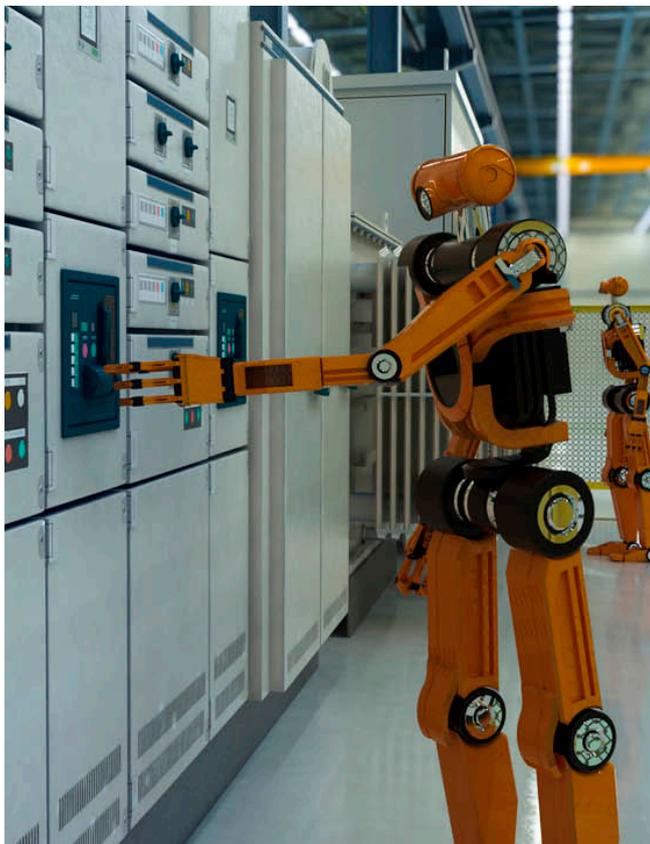
Cobots can handle several tasks such as packing commodities, assembly, machine tending, palletizing, and more. They apply to small, mid-sized, and large industries. For instance, Universal Robots has sold over 50000 cobots in several production environments worldwide [8]. Similarly, Amazon has more than 2,00,000 mobile robots working in its warehouse today [9].

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More importantly, cobots are applicable across industries, and they hold the power to enhance productivity in a given context and bring a competitive edge to the business. This is evident from the table below that illustrates several case studies under this and from across the globe [10].

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More importantly, cobots directly help the Make in India initiative. Several instances of the same are listed below:



**1** Bajaj standardized quality and empowered its workforce by deploying cobots on its assembly line to handle strenuous tasks. Today, Bajaj Auto's plant in Chakan, Maharashtra, has approximately 150 cobots on its assembly line. [11]

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**2** Cobots from Universal Robots handle CNC machine tending at New Engineering Works that led it to deliver 40% growth and the ability to manufacture 24/7. [11]

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**3** ABB is expanding its collaborative robot (cobot) portfolio by offering higher payloads and speeds. These cobots will accelerate the company's expansion in high-growth segments such as electronics, healthcare, consumer goods, logistics, and food and beverage. [12]

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**4** Cobots are much in demand, especially from the MSME sector now armed with a government's comprehensive stimulus package. [13]

The pandemic in 2020 has been a true catalyst for automation across the globe. Automation with cobots is a predominant factor to help businesses run without compromising employees' health and safety. Below are two illustrations of the same:

**1** An increase in coronavirus cases in Texas brought many businesses to a screeching halt. However, eight robots have kept all of Axis Machining's metal fabrication facility in Dallas working uninterrupted [14].

**2** DCL Logistics, a third-party logistics company headquartered in Fremont, California, saw a 30% increase in orders in 60 days as their online business exploded. Their usual approach to meet the rise in demand would have been to hire more temporary workers.

In this case, they could not, as it would have increased the risk of coronavirus exposure. As a practical solution, DCL quickly deployed an additional UR10e-based fulfillment cell. This resulted in a staggering 500% increase in productivity, with the ROI for each robot being three months [15].

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**Consequently, we need to realize that whichever business can adapt to new demands while protecting their employee interests will be resilient enough to survive and thrive in any crisis.**

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## Role of Wipro

The global market for collaborative robots may grow from \$710 million in 2018 to \$12.3 billion in 2025 [16]. There is much growth scheduled for automotive, electronics, and other manufacturing sectors. Also, cobots apply to a wide range of users due to their safety and flexibility.

Custom robotics is a current focus area for Wipro, making cobots a business-relevant avenue for us today, given our capabilities here. There are several areas of work around this that are in line with Wipro's proficiencies. Some of the related products and services can include industrial automation, IT solutions, simulations, automated testing, quality inspection, research and development, and training.

Enhancing our competency in these areas can lead us to many more business opportunities. The reason is that automation solutions are relevant and applicable to manufacturing giants and small and medium companies. Any business can deploy cobots strategically to give itself a competitive edge in its respective space. Also, several fundamental challenges will be addressed to enhance cobots' deployment across the required solutions, as has been discussed earlier. There is significant research and developmental work still pending, and Wipro is poised to contribute here.

On the other hand, we need to prepare for the change that cobots bring to workplaces as an organization. They will be a global trend, and humans need to learn how to work with them. This calls for a change among us and our working culture. While cobots will carry out their assigned tasks efficiently, it is also crucial for human employees to feel comfortable working with them to bring about best results. This kind of change is only possible with a heavy investment in training initiatives too. And in light of the myriad opportunities that cobots bring with them, it is essential to focus on rigor and innovation efforts.

## Conclusion

Cobots have evolved, and their demand has grown exponentially over the years. They are in high need across sectors due to their versatility. They can enhance productivity and innovation. They are of much business interest to Wipro and need to be our primary focus today for a better tomorrow.

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