

# Cobots are Great, but...

...what if more speed, strength or precision is needed?



How to pick the right robot, for the right job, at the right price.



The last 10 years have seen an exciting and transformative change in robotics with the emergence of collaborative robots, now known as cobots. Cobots, equipped with intrinsic safety features can operate around human workers with less safety infrastructure than traditional industrial robots. With versatile form factors and sleek designs, these robots have created a growing market for themselves across a wide range of industries, and are often the first robot that a new-to-automation manufacturer will install.

## COBOTS ARE A GREAT WAY TO GET STARTED WITH AUTOMATION, BECAUSE

- The work area rarely requires modification for a safety cage since the robot has its own safety features
- Cobots can be mounted to mobile stands for many applications because the weight and speed of operation doesn't require a fixed installation of the cobot
- Some systems allow the worker to hand guide the robot, moving it around and using the software to mark waypoints based on its position, making it easier to program than a standard robot
- Cobots can achieve an ROI in less than a year, often in just months, because of their low price points

But where does a company go after a successful cobot installation?



## COBOTS ARE NOT WITHOUT THEIR LIMITATIONS

Whether it's speed, lifting capacity, precision and sometimes reliability. What does a company do if they have other applications requiring capabilities beyond that of a cobot, or that the automated application no longer fits within the cobot's capabilities? For example, if the throughput is too low, since it is limited by the speed of the cobot, or a new part needs to be produced in the work cell and it exceeds the weight capacity of the cobot, then another robot needs to be considered.

Instead of taking the decision to add another brand, we often see the wrong robot being chosen because other factors such as training costs or usability are given a higher weight in the decision making process. Unfortunately, a suboptimal choice in the robot's performance can cause an automation project to fail, and in the extreme, prevent new projects from being attempted. We've even seen large manufacturers extrapolate their experience with cobots to all robots which results in an almost insurmountable barrier to re-introduce traditional industrial robots as part of an automation initiative.

## KEY CONSIDERATIONS FOR INDUSTRIAL ROBOT INTEGRATION

When the decision is made to move to an industrial robot, the changes necessary from a physical perspective are well understood. The two primary areas needing to be addressed are safety and physical mounting of the robot. Safety is addressed using one of many COTS solutions for a safety cage with a door that is interlocked with the robot to prevent its movement if the door is opened. The physical mounting of the robot is often done using a simple steel pedestal bolted to the floor with a plate where the robot can be mounted since often times cobots are mounted on movable stands. These are the easy aspects though when it comes to installing a new robot.



## COMPARING COBOTS TO INDUSTRIAL ROBOTS

Manufacturers often underestimate the effort to program the industrial robot, and train all the workers in the robot's programming language. Even though some robot brands make cobots and robots, the user interfaces are not consistent, and across brands there are very few similarities. There are over 30 brands of robots with more entering the market every year, each with its own programming language. If an existing work cell is being migrated from a cobot to robot, the entire program needs to be re-written since the robot programming languages are not compatible.

Many manufactures start with a Universal Robots UR5e or UR10e for their automation pilots and initial expansion into a factory. However, as noted above, they can run into limitations that require another robot to be considered if the objectives for the process can't be met. As an example, we show two common robot models, the UR10e cobot vs. a standard industrial FANUC M-10iA/12 robot on several dimensions:

	UR 10e	FANUC M-10iA/12
Reach	1300mm	1420mm
Payload Capacity	10kg	12kg
Repeatability	+/- 0.05mm	+/- 0.03mm
Speed	1 m/s	~ 5 m/s

As this table shows, the FANUC model can move 2kg more weight, at approximately 5 times the speed, and with more precision. It should be easy to make the choice to use a FANUC for this process if the requirements dictate a faster cycle time, or a slightly heavier part. However, since they are programmed

with different languages, URScript and KRL, it is a major effort to train the staff in the FANUC operations. The transition between a Universal Robot and FANUC is not seamless, which means anyone working with the robots needs expensive and lengthy training. It should also be noted that controls interfaces will likely need to be re-engineered as well since robots are not engineered to be modular replacements in most implementations. The good news is that READY's products enable manufacturers to use robots and cobots, from any brand, without an associated increase in costs from training.

## READY APPROACH

At READY, we have developed Forge/OS, the first enterprise-grade industrial operating system, that runs Task Canvas enabling virtually anyone to program virtual any robot. Task Canvas dramatically lowers the training requirements for workers, many of whom need no training because of its intuitive nature. In addition, Task Canvas plans can be transferred from one robot to another, with limited changes if the robot geometries are similar. That feature means that replacing a robot only requires minor updates, not a complete rewrite of the automation program.



By eliminating robot programming interface differences, manufacturers are free to choose the right robot, for the right job at the right price enjoying the best of what each robot, or cobot, has to offer. Cobots and robots are here to stay, and the level of innovation in the industry has never moved so quickly. Being able to pick a robot on its capabilities alone, not based on what training your team has had, means you can benefit from these advancements in the fastest possible way.



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