

Pick-and-place tasks have always been stable in various industries right from the start of the First Industrial Revolution when automation wasn't even extensively used. As the world started to embrace automation, pick-and-place sorting-based tasks continued to sustain. At the height of the Third Industrial Revolution, robots like industrial robot arms, robot grippers, and robot sorters started replacing human labour-based redundant tasks with a motive to increase efficiency and value output. Industrial robotic arms were first invented by George Devol in the late 1950s. The industrial automation pioneer Unimation introduced these robotic arms as "the Unimate" to the industrial world. Soon later a company based in Brooklyn called American Machine and Foundry (AMF) became the second company to develop an industrial robotic arm called "Versatile Transfer Machine or the Versatran" which competed with the Unimate on the market for years. Present industrial robotic arms closely resemble human arm.

Industrial robotic arms help companies attain increased and more efficient productivity through enhanced speed, efficiency, and precision across a variety of applications. Machine vision and network technologies allow robotic arms to perceive, analyze, understand, and comprehend their environments. This intelligence allows them to execute tasks with flexibility, precision, and speed while increasing output quality and industrial safety. Modern-day robot arms are fast, reliable, and accurate and can be programmed to do an exquisite number of repetitive and redundant tasks such as painting, picking, selecting, and sorting. As these arms become even more connected and extensively used, the abilities of robotic arms expand to enable new cases and business models.

In the past, training was necessary for a robotic arm to carry out certain tasks, such as selecting one sort of object from a specified place with a particular orientation. Robots were unable to distinguish between different item types, locate an object with some degree of accuracy (area rather than precise position), or modify their grip according to the orientation of the object. Nowadays, robotic arms are enhanced with the sensing and intelligence to accomplish new jobs owing to devices like powerful CPUs and GPUs and AI technology. These intelligent, vision-enhanced robots are able to detect things in their environment, identify them by kind, and operate them appropriately. Robots are now able to function more safely, quickly, and precisely because of these characteristics. They also expand the range of tasks that robots can accomplish.

With these advancements in machine vision, AI, and network technologies, robotic arms can now see, analyze, and respond to their environments while transmitting valuable data and insights back to facility and business management systems. One area that benefits from this transformation is equipment (robot included) maintenance. The robot can compute data at the edge or transmit it to a server or the cloud for remote monitoring. This process enables predictive maintenance, which in turn helps reduce maintenance costs while improving machine uptime.

Robotic arms can now perceive, understand, and act in their environment while sending important data and insights back to facility and business management systems thanks to improvements in machine vision, AI, and network technology. This change is advantageous for maintaining machinery, including robots. For remote monitoring, the robot can process data at the edge or send it to a server or the cloud. Predictive maintenance is made possible by this procedure, which lowers maintenance costs and increases equipment uptime.