

**CONCEPT** In robotics, a drive train is the mechanism that propels the robot. It usually consists of a motor, wheels or tracks, and a controller that manages the movement of the robot. The type of drive train used in a robot will depend on the specific application, such as speed, maneuverability, or terrain.

## BACKGROUND

As robotics evolved, drive trains became more sophisticated, incorporating new technologies like sensors, controllers, and advanced materials. In the 1960s, the Unimate was introduced, which used a hydraulic drive system and represented a significant advancement in automation. The 1990s and 2000s saw further advancements in robotics drive trains, including the use of more sensors, electric drive systems, carbon fiber, and titanium. Today, robotics drive trains continue to evolve, incorporating new technologies such as AI and cloud computing, with a focus on developing drive trains that are even more precise, efficient, and adaptable.

## EXAMPLES

**MOTORS:** These are the power source for the drive train and convert electrical energy into mechanical energy to move the robot.

**WHEELS OR TRACKS:** These are the means by which the robot moves and can be designed in different shapes and sizes to suit specific applications.

**GEARBOXES:** These are used to control the speed and torque of the robot's motors and enable them to efficiently transfer power to the wheels or tracks.

**SHAFT COUPLINGS:** These connect the motors and gearboxes to the wheels or tracks and allow for the transfer of power and motion.

**CONTROLLERS:** These manage the movement of the robot and include software and hardware components such as microcontrollers, sensors, and actuators.

**TRANSMISSIONS:** These are used to convert the motion of the motors into the motion of the wheels or tracks.

**BRAKES:** These are used to stop or slow down the movement of the robot and are important for safety and precision control.

**SUSPENSION SYSTEMS:** These are used to absorb shocks and vibrations and provide stability and traction for the robot, especially when operating on uneven terrain.

