

Robots

Introduction

"A robot is a reprogrammable, multifunctional machine designed to manipulate materials, parts, tools, or specialized devices, through variable programmed motions for the performance of a variety of tasks."

"A robot is an automatic device that performs functions normally ascribed to humans or a machine in the form of a human."

Webster's Dictionary

History

The word 'robot' was coined by the Czech playwright Karel Capek (pronounced "chop'ek") from the Czech word for forced labor or serf. The term 'robotics' refers to the study and use of robots and was coined and first used by the Russian-born American scientist and writer Isaac Asimov.

The first industrial modern robots were the Unimates developed by George Devol and Joe Engelberger in the late 50's and early 60's. The first patents were by Devol for parts transfer machines. Engelberger formed Unimation and was the first to market robots. As a result, Engelberger has been called the 'father of robotics.'

Use in Industry

Today 90% of all robots used are found in factories and they are referred to as industrial robots. Ten years ago, 9 out of 10 robots were being bought by auto companies - now, only 50% of robots made today are bought by car manufacturers. Robots are slowly finding their way into warehouses, laboratories, research and exploration sites, energy plants, hospitals, even outer space.

The robotics industry is booming, to say the least. North American robotics suppliers saw orders leap 36% in the first half of 2005, putting the industry on pace for a record year, according to new statistics released by Robotic Industries Association (RIA), the industry's trade group.

A total of 10,712 robots valued at \$638.9 million were ordered by North American companies through June. When orders from companies outside North America are included, overall sales for North American robot suppliers totaled 11,381 robots valued at \$673.1 million in the first half of 2005.



The April through June quarter was the robotics industry's best quarter ever, with 5,396 robots valued at \$336.3 million ordered by North American manufacturing companies.

Robots are useful in industry for a variety of reasons. Installing robots is often a way business owners can be more competitive, because robots can do some things more efficiently than people.

1. Robots never get sick or need to rest, so they can work 24 hours a day, 7 days a week.
2. When the task required would be dangerous for a person, they can be do the work instead.
3. Robots don't get bored, so work that is repetitive and unrewarding is no problem for a robot.

Although robots can't do every type of job, there are certain industrial tasks robots do very well including:

- **Assembling Operations** - Assembly accounts for approximately 33% of the applications of the world robot stock (1997). Many of these robots can be found in the automotive and electronics industries.
- **Continuous Arc Welding & Spot Welding** - One of the most common uses for industrial robots is welding. Robot welded car bodies for example enhance safety since a robot never misses a welding spot and performs equally well all through the day. Nearly 25% of all industrial robots are used in different welding applications.
- **Packaging/Palletizing** - Packaging/palletizing, is still a minor application area for industrial robots, accounting for only 2.8% (1997). This application area is expected to grow as robots become easier to handle.
- **Spray Coating/Painting**
- **Material Removal**
- **Machine Loading**
- **Material Transfer**
- **Cutting Operations**
- **Part Inspection**
- **Part Sorting**
- **Part Cleaning**
- **Part Polishing**