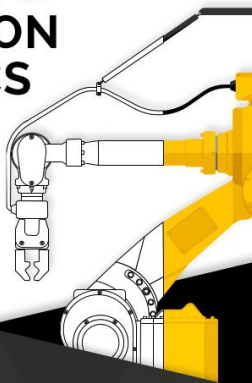


# THE EVOLUTION OF AUTOMATION & ROBOTICS

Automation has utterly transformed manufacturing and warehouse operations — but the most exciting developments are yet to come.



## AUTOMATION HISTORY

**1947:** General Motors establishes an "automation" department to oversee the development of mechanized controls for assembly lines.

**1961:** The first true robot is introduced, to unload parts in a U.S. die-casting operation.

**1990s:** Automation connects with business process management (BPM) to create advanced, integrated robotics systems.

**2000:** Honda unveils ASIMO (Advanced Step In Innovation Mobility), a revolutionary humanoid robot.

**1960s:** Integrated circuits, and advances in computer storage capacity and controls, expand industrial applications for robotics.

**1981:** A revolutionary design that increases the speed and agility of robots, SCARA (Selective Compliance Assembly Robot Arm) is introduced in Japan and soon put into operation by Mitsubishi.

**1996:** A computer, Deep Blue, loses to reigning world chess champion Garry Kasparov — but defeats him in a 1997 rematch. This event ushers in rapid development of AI in robotics.

**2011:** Apple introduces SIRI, voice-recognition software that stimulates rapid VR development.

## AUTOMATION PRESENT



### MAJOR APPLICATIONS

- Assembly
- Arc Welding
- Cutting, Grinding, Deburring, Polishing
- Gluing, Sealing
- Painting
- Quality Control
- Order Picking
- Packing & Palletizing
- Transportation
- Material Handling

### HOW ROBOTS ENHANCE INDUSTRIAL HEALTH & SAFETY

- Keeps humans out of hazardous and harsh environments
- Reduces injuries due to human error or fatigue
- Replaces human labor on dull, repetitive tasks
- Handles the heavy lifting



## AUTOMATION FUTURE

**Autonomous robots:** Mobile machines moving products through warehouses and factory floors.

**Co-bots:** Collaborative robots working together to accomplish more complex tasks.

**Microbots:** Helping emergency responders explore small or dangerous spaces.

Health and elder care will see dynamic growth, with rehab robots, active prostheses, exoskeletons leading the way.

**Drones:** For transportation, agriculture, warehouse scanning and more.

