

# 3 TECHNOLOGIES TRANSFORMING THE MANUFACTURING INDUSTRY



At this point, there's hardly an industry in existence that has not been dramatically transformed by technology. Everything from education to music to mass media is different because of technological advances, many of which have occurred only in the past quarter century.

Manufacturing is an industry that seems to be one of the most impacted by the tech revolution. In fact, our industrial revolution predecessors would probably hardly recognize today's assembly line. And, their jaws would hit the floor if they were to behold the efficiency, speed and uniformity with which we're able to make things today.

All of this change has been brought about by a few key technologies.

## **1. Robotics**

When the layman thinks of manufacturing, he probably thinks of an assembly line made up of humans, each handling one part of the assembly process. This is still how some factories function, but many of those humans are being replaced by robots ... no, not the kind that walk and talk, but the ones that can do automated manufacturing work that's perfect all day, every day.

Automated robotics came on the scene in 1961 in the form of Unimate, a robotic arm that assisted General Motors in rolling automobiles out to a car-crazed country. Though it looks a bit primitive to us now, Unimate was a huge development for manufacturing at the time – it was immune from all the issues that make human beings fallible, inconsistent and unreliable.

Sure, it wasn't perfect for every step of the process, but it was ideal for the many unskilled, repetitive tasks that needed to be done hundreds or thousands of times a day. Though robots can't make decisions, use creativity or adapt to changes, in the right context, they can more than double a factory's efficiency and greatly increase its consistency in output and quality.

## 2. 3-D Printing

To many people, 3-D printing still seems like something out of a science fiction movie – telling a machine to make you a bowl or a brick or a table and then having that thing pop out fully made is pretty incredible, no matter who you are. And although the technology used to be more about wowing us in its ability to shoot out a blue plastic elephant, now 3-D printing is being seriously implemented in manufacturing in a great many industries.

In the last year, we've seen the technology used to print artificial human body parts, rocket components, engine blocks and even entire homes. The incorporation of 3-D printing in manufacturing is not a thing of the distant future; it's happening now. Change is currently underway, but you can safely expect that that change will only grow exponentially over the next decade.

The very existence of a huge factory made up of various assembly lines, laborers and robots may be an antiquated notion sooner than later. Design has gone almost fully digitized already, but the physical implementation of those designs will likely soon go the same way, so that making anything from a pair of shoes to a car will be entirely digital – from conception to creation.

### **3. CO<sub>2</sub> Snow Cleaning**

Cleaning would be a whole lot easier if it wasn't for that pesky water, right? In the manufacturing process, cleaning is required in several steps – unfortunately, most methods of cleaning are messy, hazardous, inefficient, and far too rough for many delicate parts.

Enter CO<sub>2</sub> snow cleaning, a waterless cleaning method that successfully eliminates those issues that complicate precision manufacturing in industries like data storage, automotive, and medical device. Recycled liquid dry CO<sub>2</sub> drawn from a source expands to form “snow” particles that are forced through a nozzle to clean by precisely impacting the surface.

And just as robotics are streamlining the assembly line, so is dry CO<sub>2</sub> cleaning – systems can be automated for improved efficiency and have recently taken the automotive plastics industry by storm. BMW and VW are the first European automotive manufacturers to implement these practices, but more will surely follow.

Another huge shift in the manufacturing is that towards environmentally-friendly practices, and where recycled CO<sub>2</sub> succeeds is in preventing water and chemical waste from entering and harming the environment.

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