

Could Star Trek's Replicator Become a Reality with 3D Printing Technology?

GT GreenbergTraurig

Article By

[Chinh H. Pham](#)

[Greenberg Traurig, LLP](#)

[Emerging Technology](#)

- [Biotech, Food, Drug](#)
- [Health Law & Managed Care](#)
- [Antitrust & Trade Regulation](#)

- [All Federal](#)

Thursday, January 28, 2016

The TV franchise *Star Trek* featured some amazing technological advancements that have continued to intrigue us for many years. For example, the “replicator” was a device that was able to instantly produce nearly any object, food or medicine on demand. Imagine how such a technology could change the way we live, the food we eat, and the medicine we need.

Well, we may not be that far away from inventing a real replicator thanks to 3D printing technology. Over the last few years, 3D printing has emerged as an innovation that can transform nearly everything, from manufacturing to medicine to entrepreneurship.

How Does It Work?

3D printing is the process of creating three-dimensional objects based on a digital map. 3D printers can print using a variety of materials which can include plastic, metal, carbon fiber, and printers are even being developed that can print sugar, chocolate, and even living cells. These materials are dispensed by layers either (a) from a printer onto a moving/rotating platform, or (b) from a rotating nozzle onto a platform in order to create a three-dimensional object. The industrial term for 3D printing is Additive Printing. Unlike traditional printing, the 3D process no longer covers flat paper surfaces with a single layer of dots, but rather deposits layers of the material *on top* of one another to create a 3D object. The amount of materials being dispensed, the rotation of the surface onto which the object is being printed,

the design of the object being printed, and many other parameters is controlled by software.

There are a variety of 3D printing processes, and not all of them use the same approach or technology:

- Some cure or harden the materials with UV light, as each layer is being built (Vat Polymerization, Material Jetting)
- Some use a melting or softening material to produce the layers to build the object (Material Extrusion, Powder Bed Fusion, Directed Energy Deposition)
- Some glue or weld the layers of material in building the object (Binder Jetting, Sheet Lamination)

Numerous Applications Across Diverse Industries

With the rise of low-cost 3D printers in recent years, the technology has become truly disruptive to a wide range of industries and businesses. The applications for 3D printing are numerous.

Food. 3D printing has gained traction in the food industry, and has the potential to revolutionize food production by boosting culinary creativity, food sustainability, and nutritional customizability. Everyday foods such as pasta and candy can now be printed, which could have life-saving implications for hunger-stricken populations around the world. Similarly, NASA is exploring the possibility of using a 3D printer on deep space missions to produce food for astronauts.

Medicine. Medical science and research is another sector that is benefiting from 3D printing technology. Layers of living cells can now be deposited onto a gel medium and slowly built up to form 3D structures. This bio-printing technology can potentially have significant applications in the area of tissue engineering to potentially replicate human tissues, organs, blood vessels, and can help many patients who are waiting for organ donation or eliminate such needs altogether. Bio printing can also be used to print artificial limbs and can customize it to individual patients. It is projected that by 2020 bio-printing can be used to produce functional human limbs and tissues.

Manufacturing. The aerospace and automotive industries as well as other types of manufacturing have been realizing the benefits of 3D printing technology for some time. 3D printing can be utilized to produce parts and components, can be used to generate an assembly of such parts and components in a single build, can reduce tooling, machining, can increase efficient designs and design changes for more effective prototyping and experimentation, and can lower the need to maintain inventory, as parts can be printed on-demand. Parts that once took a week to generate with significant investment, can now be done almost instantaneously with 3D printing technology at much reduced costs.

The consumer sector is another area that can greatly benefit from 3D printing technology. Initially, the domain of hobbyists and enthusiasts, personal 3D printing has gained much wider traction. With cheaper and cheaper 3D printers becoming

more available, personal printing or fabrication can provide the consumers with the freedom never before experienced. The consumer can now reproduce, in his own home, a broken part/component of a device, replace a missing piece from a favorite game, design a toy model for play, and so many more uses and applications.

The Future Has Arrived

Current conventional wisdom is that 3D printing will eventually be able to physically replicate most objects that we can scan and digitally define. However, many of the 3D printed objects will not have the same functionality as the original object, at least not in the immediate future.

If you are a Star Trek fan, you can see that we are getting closer to making the show's famous replicator a reality!

And finally, it is also worth noting that 3D printing technology companies should be on the lookout for regulatory and intellectual property issues that could arise as this technology develops.

©2019 Greenberg Traurig, LLP. All rights reserved.

Source URL: <https://www.natlawreview.com/article/could-star-trek-s-replicator-become-reality-3d-printing-technology>