

# Disruptive technologies - 3D printing

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10 Dec 2014

The future of how things are made is evolving rapidly to fit a changing world. Driven by disruption, it's no longer science fiction or limited to the imagination, the design-led revolution is now underway driven by cloud and advances in collaboration, simulation, visualisation, 3D printing and solutions.

3D printing is an amazing overnight success that has been 20 years in the making and gives us the ability to create just about anything we can imagine. Up until recently it has been used as a prototyping tool to test out designs. Now more cost-effective, flexible and growing every day, 3D printing is making its way into the mainstream. Gartner's 3D Printers Worldwide Forecast report issued in October 2013 predicted that shipments of 3D printers will grow 75% this year alone, a testimony to its growing popularity and uses.

## How it works

3D printing (also referred to as *additive manufacturing*) is a process of making a three-dimensional solid object of virtually any shape from a digital model. 3D printing is achieved using an additive process, where successive layers of material are laid down in different shapes.

Autodesk, the world's leading 3D CAD software company, has developed a broad portfolio of 3D CAD software programs to help designers and engineers explore design ideas, visualise concepts, and simulate how designs will perform in the real world, further breaking down the barriers between physical and digital worlds. This allows them to produce a cost effective prototype, using 3D printing, to test the product as well as determine any adjustments that need to be made. This greatly reduces the time it takes to go-to-market with a new product.

## Where is it heading in the future - application and benefits?

Not more than 100 years ago, design created the world we're currently living - and did it right. The big question of the future is - what's the right thing to design now? That fundamentally is a question of design and how design can solve future challenges. 3D printing will make it possible for us to create all sorts of things we create today, better, and to create all sorts of new things that we haven't even imagined yet.

### 1. 3D Digital manufacturing and biomedical innovations

3D printing will unlock massive potential with benefits already being seen in the manufacturing, health, engineering and construction industries. It will allow many industries to bring digital designs to fruition, anything from prosthetic limbs to appliance parts can be made. 3D printing can be used to prototypes, create replacement parts, and is even versatile enough to print viruses, prostheses and medical implants in colour, using different materials.

It will have a growing impact on our world, as more and more people gain access to this amazing technology. In tandem with this, manufacturing techniques are becoming increasingly democratised while simultaneously becoming both more powerful and cheaper.

### 2. New materials

We have a range of new materials, created through 3D printing and synthetic biology that allow for new ways of making things. From different types of wax or plastic, ceramics, to metals like steel, brass, bronze, silver, gold and platinum.

### 3. Open 3D software

Now that 3D printing is well on its way to becoming available to everyone, Autodesk recently introduced innovative software products to come to the 3D printing space. "Spark", the 3D printing platform takes the technology to the next level.

Spark is an open 3D printing software platform that will make it easier for hardware manufacturers, software developers, materials scientists, product designers, and others to participate in and benefit from this technology. Spark connects digital information to 3D printers in a new and streamlined way, making it easier to visualise and optimise prints without trial and error, while broadening the range of materials used for printing. And because the Spark platform is open, everyone can use its building blocks to further push the limits of 3D printing and drive fresh innovation. Spark will be open and freely licensable to hardware manufacturers and others who are interested.

Spark is compatible with any and all types of 3D printers, whether it is SLA, FDM, or even industrial level selective laser sintering machines. The algorithms, which the platform includes, is applicable all the way across the entire spectrum of 3D printing technologies.

3D printing is a game changer and will affect almost every aspect of business and our personal lives now and in the future. It will change the world as we know it and the possibilities are endless.

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