



Deloitte Global's predictions

- 3D printing will enter a new growth phase in 2019, offering viable advanced capabilities to manufacturers and moving beyond novelty status for consumers.
- Improvements in the technology of 3D printing, including the availability of materials used and the ability to print larger items, will allow 3D printing to be utilised not just in prototyping, but throughout the manufacturing process.
- The quality of products produced by 3D printing will usher in a new era of personalisation and customisation for consumer products.
- Sales related to 3D printing – including enterprise 3D printers, materials and services – will surpass £2.1 billion in 2019 and £2.4 billion in 2020.

Why is 3D printing on the rise again?

After the initial excitement surrounding 3D printing, growth slowed as the technology's limitations became apparent. Traditionally, industrial grade printers have been used almost exclusively for rapid prototyping, with the industry unable to take the next step – creating more products at scale, and at the speed necessary to make the technology a viable alternative to traditional manufacturing. In 2019 and beyond, this is set to change. 3D printing is experiencing a new era of growth because companies in multiple industries have begun to identify new uses for the technology beyond just rapid prototyping. This change is driven by three factors: the materials that can be used, the speed at which printing takes place and the size of objects that can be printed.



Materials

3D printers are now capable of printing a greater variety of materials than before, including different types of metals. The shift towards metals is key to growth in the manufacturing industry because although plastics are fine for rapid prototyping, metal parts are more frequently required for the end-product.



Speed

Building a part, one ultrathin layer at a time, is an inherently slow process. But printers are getting faster. While printing time does vary depending on the complexity of the product's shape, the quality of the print and/or the materials used, the 3D printers on the market in 2019 will be nearly twice as fast compared to 2014 models.



Size

Not only are 3D printers getting faster, but their build volume – the printable objects' size – is growing. A few years ago, a typical high-end metal printer could only build an object that was smaller than 10x10x10 centimetres, or a cubic litre. In 2019, multiple printers are available with a 30x30x30 centimetre volume, or 27 cubic litres. This allows for larger objects to be made without the need to print smaller objects and then assemble them. Progress is also being made on very large build volumes, with the x, y, and z axes measured in metres rather than centimetres.

Consumers will directly experience 3D printing as companies develop a range of bespoke, customised products for them based entirely on the technology.

What does this mean for consumer-facing businesses?

More and more consumer businesses are responding to constraints in their supply chain and manufacturing operations by opting for 3D printing, meaning that consumers are beginning to experience the benefits of 3D printing directly, even if they are not aware of it. Consumer electronics and automotive industries will represent a combined 40% of the coming growth in 3D printing, followed by medical devices with 15%. For example, already 98% of hearing aids worldwide are manufactured using 3D printing.¹

Also it is not just minor components in complicated consumer technology where 3D printing will be utilised. Consumers will directly experience 3D printing as companies develop a range of bespoke, customised products for them based entirely on the technology. The technology is well suited to product customisation because it can support a wide variety of complex geometries without the manufacturer needing to incur the additional setup costs typically associated with tailoring a product. For example, with conventional manufacturing techniques, customisation can require multiple and unique machine setups, unique moulds and other tooling, and product-specific post-processing. Whereas 3D printing can use a software-driven approach to program custom outputs without physically changing the production equipment.

Skincare is a sector that can highly benefit from offering more personalisation. Recently, the beauty brand, Neutrogena, has introduced a patent-pending 3D printed sheet mask, MaskiD, that delivers personalised skincare solutions powered by user data captured in an app including facial measurements and skin data. Using this data, a custom-fit hydrogel mask is 3D printed to conform to the contour of the face and lock in potent skincare ingredients, which are 3D printed onto the mask. The masks are manufactured on demand and delivered directly to the customer.²



Case study
3D printing in the automotive industry

The manufacturer of the Mini introduced the 'Mini Yours' personalisation service which allows customers to personalise their cars with 3D printing and laser engraving. When purchasing a new Mini, consumers will be able to use a simple online tool to choose from different side decorations, personalised door handles and LED lights for the doors. When all customisations have been selected, Mini manufactures the bespoke pieces in their factories, making use of 3D printing to bypass costly changes to machine configurations.

At the other end of the market, French luxury car brand Bugatti is pushing the boundaries of what is possible in the world of 3D printing. For the first time, developers at Bugatti have succeeded in designing a Titanium brake calliper that can be produced by 3D printing.² This is a significant achievement especially since Bugatti cars use the most powerful brakes in the world. Given that the price of their three models typically range from \$1.7 million to \$3 million, and the cost of an oil change is the same as a new Toyota Camry, a Bugatti may not be on the shopping list of the average consumer, but as a member of the Volkswagen group, it is expected that technological innovations from Bugatti will, in time, filter down to the mainstream market.³



Bottom line

3D printing technology represents a potentially valuable option and investment for companies as they consider adapting their products to satisfy the demand for customisation. As the technology continues to improve, its ability to enhance product performance is expected to increase. With improved performance, 3D printing is likely to move from being a niche technology used only by innovators to a more commonly used technology for core production activities. The ability of 3D printing to produce customised products without the need for costly changes to production machinery will allow businesses to offer customised products to their consumers at a fraction of the previous cost.

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Endnotes

1. <https://www.computerworld.com/article/3066862/emerging-technology/3d-printing-industry-to-triple-in-four-years-to-21b.html>
2. <https://www.tctmagazine.com/3d-printing-news/neutrogena-personalised-3d-printed-maskid/>
3. <https://www.3dnatives.com/en/3d-printing-mini-100120184/>
4. <https://www.bugatti.com/media/news/2018/world-premiere-brake-caliper-from-3-d-printer/>
5. <https://www.cnn.com/2018/09/18/a-bugatti-hypercars-oil-change-costs-as-much-as-buying-another-car.html>

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