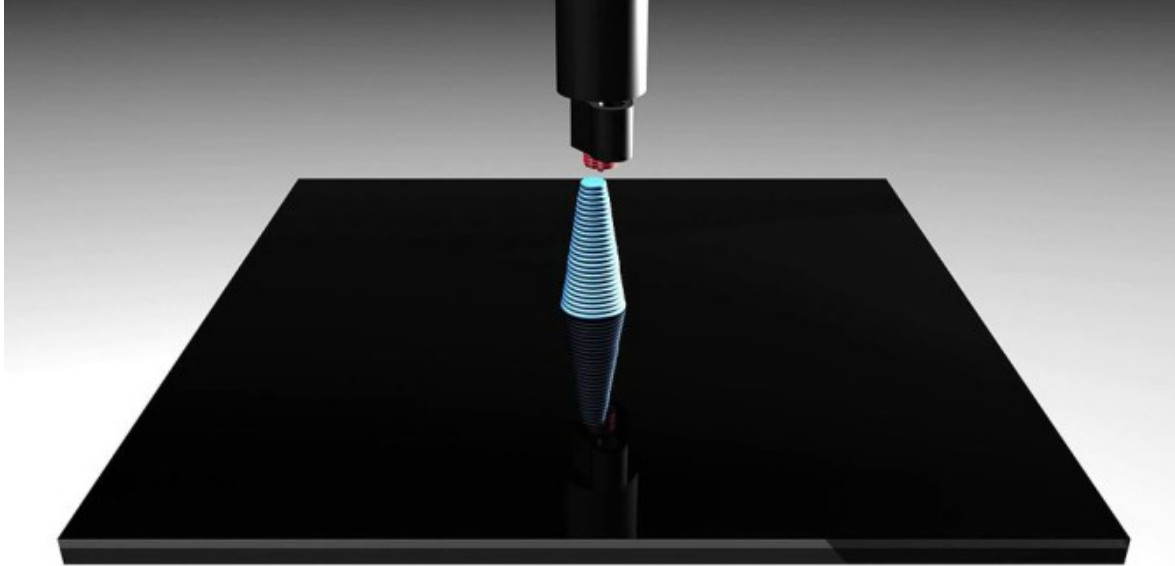


For 3D printing to go mainstream, it needs a platform



It is a truth all but universally acknowledged that in our digital age every great technology is in need of a platform to enable it to make the leap from technological renown to mass application. We have all heard of the stories of how sector after sector has been transformed by platforms. Think of telecommunications, media and entertainment and, more recently, hospitality and mobility. From Uber to Airbnb, platforms are the business model revolution of choice.

But if you talk to executives in B2B (*business to business*) companies in heavy industries they tend to think that platform business models simply do not and cannot apply to them. "Platforms are for B2C," (*business to consumer*) they will typically observe with resignation.

Such shrugging of shoulders may well be premature. There are strong signals that B2B sectors, even the most traditional and heavy ones, are the next in line to be disrupted by platforms. After construction and agriculture, on which we wrote, the next in line for the platform treatment may well be 3D printing, which is currently languishing like a character in a Jane Austen novel, waiting to be swept off her feet by an industrial Mr. Darcy.

In 3D printing the initial hype has given way to scepticism. The current share price of 3D printing machine manufacturers leaders, like Stratasys and 3D System, is down 80 per cent from the peaks of 2014. The expectation of speedy and dramatic expansion into mainstream manufacturing has not materialised.

There is a fundamental reason for this, as we have observed in other industries. Even a fantastically impressive technology like 3D printing is not enough; the business model is more important. It is the business model that has the power to transform existing industries and also to accelerate the development of early stage industries like 3D printing.

Indeed, the 3D printing market has been associated with the manufacturers of printers. As the technology has developed over the last decade, a small number of printer manufacturers have been able to secure high profits for themselves. While this was, obviously, good news for them, it has proved a hindrance to the sector's growth and innovation dynamics. The business model pursued by printer makers like 3D Systems and Stratasys is similar to that of Gillette and its razor blades. In this model consumables are the main source of profit. It is a closed system. You can use the printer only when you also use the manufacturer's resin/ink and software. Printer manufacturers employ lock-in strategies on the ink materials through key-coding and RFID tagging of material cartridges.

The trouble with closed systems is that one printer manufacturer alone cannot offer the materials needed for the thousands of potential 3D printing applications. As a result, such a closed system limits innovation in terms of end-user applications, materials as well as data on material performances in combination with different printers.

Creating a closed system means that 3D printing has reached an impasse. To break free the industry has to be conceived as an open system.

In the last couple of years new actors coming from adjacent industries have been trying to open up 3D printing. This is progress. Usually open systems win over the long term as we have learned from the computer operating model historical lesson.

Consider HP and its recent entrance to additive manufacturing with an open platform approach. Rather than having a proprietary closed system with its own materials, HP is open to third party material development. It is offering a 3D printing industry materials development kit (MDK). This is like a software development kit (SDK) in software open platforms for new apps, like Apple store for example. The MDK enables companies interested in certifying their materials to quickly test the compatibility of 3D powders with HP Jet Fusion 3D printers before submitting them to HP for certification.

HP has also recently announced the opening of the world's first 3D Open Materials and Applications Lab where material developers from all over the world can come to innovate, iterate and test materials. Some chemical companies are joining the initiative to accelerate material development.

With an even more holistic mission built on openness, Autodesk has recently planted the seed of a future platform business model that will help users find the right machine and material combinations for a targeted application. The first step to achieve this bold vision is the Additive Manufacturing Alliance: an ecosystem of contributors. This includes leading machines and materials companies (for example, DSM, Formlabs, polySpectra, and Structured Polymers). Working together, they will simulate a multitude of tests to develop data on how certain materials perform with machines for specific applications. This will create a dataset able to allow designers and engineers to choose from combinations of materials, machines, and parameters. Once released, this catalog of additive manufacturing data from the ecosystem of contributors will be accessible via the Autodesk Netfabb platform.

What we are seeing here are the first signs of a multi-sided 3D printing platform. In the years to come, this platform is likely to mean that engineers and designers will access the (digital) platform, input their target application-object and search/filter the optimal configuration options in terms of materials, parameters, printer, etc. The orchestrator of such a platform will be most likely be a software provider acting as the Operating System and search engine. The platform will grow thanks to the network effect: more data on materials and machine performances will attract more users who will attract more producers of data and information to upload their solutions and knowledge.

Who will be the winners and losers in the re-configured industry likely to emerge around the 3D printing platform?

Digital players like Autodesk or HP are well positioned to be the leaders of this new open world. In the future they are likely to orchestrate the process of matching value between users and producers. Traditional closed system manufacturers will probably need to rethink their strategies as openness will improve inter-operability, drive prices down and accelerate innovation. Chemical companies and other material producers will have plenty of opportunities to co-create solutions for new applications and could leverage user data to improve their R&D. They will also need to develop capabilities to manage the new digital channel on top of the existing traditional ones.

In turn, this will accelerate the adoption and penetration of additive manufacturing in mainstream production rather than in the niche market of prototyping as it is today. And, of course, end users will benefit from broader, better and cheaper options available with a few clicks on the platform (simulating the right combination of material properties, printer software settings, printer and also cost).

Finally, the industry will meet their 3D-printed Mr. Darcy.



Notes:

- *The post gives the views of its authors, not the position of LSE Business Review or the London School of Economics.*
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