

Shaping the Future with Metal 3D Printing

In the current dawn of industry 4.0, the digital revolution of industries, 3D printing is expected to become a key technology that could reshape the standards of manufacturing, layer by layer. How can involved actors prepare for this change? What is stopping them from implementing it right away? Challenges and opportunities are rising ahead, but supporting strategies could help manufacturers handle the upcoming uncertainties and prosper in this new environment.

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Metal 3D printing paves way for a number of possibilities, such as shortened lead times, increased circular economy, and reduced need for transports. At the same time, it faces challenges in relation to the lack of knowledge, slow production speed, and undeveloped standards. As 3D printing in metal is still largely undiscovered within mass production, questions arise for existing actors in the field. There is a need for deeper knowledge on how supply chains and individual companies would be affected by an implementation of the technology. Which path to follow depends on the company's intentions; where different benefits of 3D printing align with different strategies.

In order to reap the fruits of this technology full of potential, business strategies and business models alike need to be reinvented. Business models provide a comprehensive way of visualising business activities and relating strategies. To adapt to emerging changes, such as the growth of 3D printing, business model innovation is a useful practice to make the most out of the opportunities while minimizing the risks related to the technology. Innovating relevant elements of the business model is needed to align companies' specific situation and capabilities with their strategy. In the case of 3D printing, the related business model becomes an addition to the general business model of the corporation.

Three potential implementations of 3D printing, in manufacturing firms, are identified; (1) development of new products, focused on design optimization and increased functionality, (2) globally distributed manufacturing of specifically requested parts, focused on shortened lead times and reduced transports, and (3) a digital warehouse where customers can pick and choose among products to print themselves. All of these scenarios provide different benefits and correspond to various obstacles.

A strategy that considers both the different opportunities of 3D printing, and the actions of competitors, is deemed crucial to be successful. For example, for a company that is focused on collecting patents and selling solutions, research and development within metal 3D printing may be optimal. For a firm that is serving a user base with lots of different spare parts and want to enhance their service offering, the focus could instead lay on creating a global network that utilizes printing-on-demand. Relevant competences and processes are then shaped accordingly.

Furthermore, by shifting production method to 3D printing, there is a need to determine which items would benefit the most from being printed. Depending on the strategy of the company, different items should be prioritized in the selection. Two potential item selection processes are (1) to evaluate one product at a time to determine if it is valid for 3D printing, or (2) to filter products from a larger database to find and prioritize among a greater number of potential candidates.

Actors in the manufacturing industry need to keep up with an everchanging environment and update their business models accordingly. Adopting 3D printing may involve some level of risk, although ignoring its impact and missing out on the benefits could pose an even greater threat.