GLOBAL IMPACT OF 3D PRINTING ON INDUSTRIES

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<u>Executive Summary</u>

This report circles around the applications of 3D printing technology and its potential use cases across six of the most important industries. 3D printing is a revolutionary manufacturing technology that shows the potential to revitalize traditional manufacturing methods. The practice of 3D printing focuses on the forging and molding of stock materials using computerized blueprints that create physical objects. This analysis will explore the advantages, limitations, recommendations and actions of this new manufacturing technology across six industries.

3D printing technologies can date back to the 1980s and has gained the title of *Additive Manufacturing*. This technology has progressed from only being used in factory and industrial settings to more innovative, everyday use items using unorthodox materials. Although most iterations of 3D crafted products are in the prototype stages at the moment, more and more products are being brought to the market for consumer use. This opens up a whole new world of potential use cases and innovative solutions.

In Healthcare, 3D printing technologies are being manipulated to create new forms of healthcare solutions. The main areas showing promise include customized prosthetics, drug formulation, bioprinting organs and the production of surgical instruments. These areas will enable the industry to be more efficient and change the patient experience entirely.

The new additive manufacturing process has the ability to disrupt current manufacturing processes. Due to its design process of intricate shapes and formations, 3D printing is a unique and incredibly promising manufacturing tool. Mass manufacturing of large-scale products could be adopted by incremental process improvement, including lean processing and creating more efficient and higher quality products.

3D printing technology is making waves in transforming education and research to meet the Industry 4.0 challenges. This exploration focuses on the modernization of educational programs through incorporating 3D printing technologies into curriculum. It also fosters a simplified way to teach future generations including technologies that will shape the future. The impacts on STEM education are of incredible value and can add directly to transforming global education systems.

Some industries have not seen revolutionary results as of today. These include construction, food and transportation. In the construction sector, changes are slow moving and hard to implement but use cases have been identified to be unique. The food and agriculture industry have also seen less effective 3D printing solutions but there are interesting use cases being identified by modern restaurants and even NASA. The transportation manipulates 3D printing technologies to create innovative automotive and transportation vehicles as well as transport structures. This technology also affects the actual transportation of materials which impacts the industry as a whole.

While some industries are already making headway and promising a revolutionary transition towards 3D printing, others are at a different stage where extensive research and experimentation is underway. For each industry, it is important to identify whether or not 3D printing brings value to support the current systems. As long as the proposed use cases are identified as "financially efficient" or superior in quality, the adoption of 3D printing should become easier. Important thing for the reader is to evaluate whether the industry they represent faces a problem that 3D printing can solve using the solutions presented in the report?