

Research Proposal

Area of Research-3 D Printing

INTRODUCTION

Digital fabrication technology, also referred to as 3D printing or additive manufacturing, creates physical objects from a geometrical representation by successive addition of materials. Nowadays, 3D Printing is widely used in the world. 3D printing technology increasingly used for the mass customization, production of any types of open source designs in the field of agriculture, in healthcare, automotive industry, locomotive industry and aviation industries. 3D printing technology can print an object layer by layer deposition of material directly from a computer aided design (CAD) model.

At the same time, there are several disadvantages the adoption of 3D printing technology in manufacturing industry. For instance, the effect of the use of 3D printing technology will reduce the use of manufacturing labour so automatically will greatly affect the economy of countries that rely on a large number of low skill jobs. Furthermore, by using 3D printing technology, users can print many different types of objects such as knives, guns and dangerous items. Therefore, the use of 3D printing should be limited to only certain people to prevent terrorists and criminals bring guns without detected. At the same time, the people who get a hold of a blueprint will be able to counterfeit products easily. This is because, the use of 3D printing technology is simple, just sketching, and set the data in the machine-printed so 3D objects can generate.

Materials Used for 3D Printing Technology in Manufacturing Industry

1. Metal
2. Polymer
3. Ceramics
4. Composites
5. Smart Materials

6. Special Materials like food (Chocolate, Candy, Pizza), Textile Materials.

Types of 3D Printing

1. Binder Jetting
2. Directed Energy Deposition
3. Powder Bed Fusion
4. Sheet lamination.

Brief overview of 3D printing

The first 3D printing technology was developed by Charles Hull in 1986, and was followed by numerous novel technologies evolved over the decades. Customized functional products in 3D printing will be the mainstream of industry as predicted by Wohlers Associates, who has envisioned that about 50% of 3D printing will revolve around the manufacturing of commercial products in 2020. Currently, American Society for Testing Materials (ASTM) and ISO standards recognizes seven 3D printing technologies adapted for medical use to a certain extent: powder bed fusion, material extrusion, material jetting, binder jetting, sheet lamination, direct energy deposition, and vat photopolymerization.

Objective

To Develop a model using 3 D printing which would be beneficial to the society.

Preliminary Literature Review

A Preliminary Literature review showed that 3D printing technology is a truly innovative and has emerged as a versatile technology stage. It opens new opportunities and gives hope to many possibilities for companies looking to improve manufacturing efficiency. Conventional thermoplastics, ceramics, graphene-based materials, and metal are the materials that can be

printed now by using 3D printing technology 3D printing technology has the potential to revolutionize industries and change the production line. The adoption of 3D printing technology will increase the production speed while reducing costs. At the same time, the demand of the consumer will have more influence over production. Consumers have greater input in the final product and can request to have it produced to fit their specifications. At the meantime, the facilities of 3D printing technology will be located closer to the consumer, allowing for a more flexible and responsive manufacturing process, as well as greater quality control. Furthermore, when using 3D printing technology, the need for global transportation is significantly decreased.

REFERENCES

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