

Análisis documental de las ventajas de la impresión 3D

Documentary analysis of the advantages of 3D printing

Análise documental das vantagens de impressão 3D

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Resumen

El presente trabajo es un análisis documental sobre la impresión 3D, la cual ha sido una revolución tecnológica en México en los últimos años. Para ello se estudiaron las principales ventajas de esta tecnología.

A pesar de que la impresión 3D se ha utilizado desde hace algunos años para distintos fines, se ha dado a conocer de forma más comercial y generado bastantes beneficios.

En este escrito se explica qué es la tecnología de impresión 3D y sus principales ventajas.

Dicha tecnología nació oficialmente en 1986, cuando Chuck Hull solicitó la patente de la estereolitografía, que en su momento no causó mucho impacto pero que actualmente ha ayudado mucho al avance industrial ya que facilita la obtención de distintos recursos en un tiempo mínimo y a un precio mucho menor que el de cualquier otro producto similar fabricado de manera tradicional.

En conclusión, las impresoras 3D son una tecnología muy útil para la sociedad cuando se utiliza de la manera adecuada.

Palabras clave: impresión 3D, ventajas, prototipado, análisis, tecnología.

Abstract

The present work is a documentary analysis of 3D printing, which has been a technological revolution in Mexico in recent years. The main advantages of this technology were studied for this purpose. While 3D printing has been used for years for different purposes, it has become better known commercially generating multiple benefits.

This paper explains what the technology of 3D printing is and its main advantages.

This technology was officially born in 1986, when Chuck Hull applied for the patent of Stereolithography, that at the time it did not cause much impact but that currently has helped to advance industry since it facilitates obtaining different resources in minimal time and at one price much lower than that of any other similar product made in traditional way.

In conclusion, 3D printers are very useful technology for society when used appropriately.

Key words: printing 3D, advantages, prototyping, analysis, technology.

Resumo

Este trabalho é uma análise documental de impressão em 3D, que tem sido uma revolução tecnológica no México nos últimos anos. Para fazer isso as principais vantagens desta tecnologia foram estudados.

Embora a impressão 3D tem sido usado por alguns anos para diferentes fins, que lançou comercialmente mais e gerado lucros suficientes.

Neste documento explica a tecnologia que a impressão 3D e as suas principais vantagens.

Esta tecnologia nasceu oficialmente em 1986, quando Chuck casco arquivou uma patente para estereolitografia, que no momento não causou muito impacto, mas que agora tem ajudado muito ao progresso industrial, uma vez que facilita a obtenção de vários recursos em tempo mínimo e com um preço muito mais menos do que a de qualquer outro produto semelhante fabricado de uma maneira tradicional.

Em conclusão, as impressoras 3D são uma tecnologia muito útil para a sociedade quando usado da maneira certa.

Palavras-chave: impressão 3D, vantagens, prototipagem, análise, tecnologia.

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Introduction

3D printing is a little-known technology and few have access to it. It began in 1983 when the inventor Chuck Hull invented the first method of 3D printing or Stereolithography, it is a manufacturing process by adding that uses resin curing through ultraviolet light in a tank, and a UV laser to build objects that are obtained by the addition of fine printed layers one above the other.

Beginning in 2014, 3D printing evolved into a very immediate potential massive utilization for manufacturing instant household objects and the generation of organic tissues from cellular bases.

“A 3D printer is a device capable of generating a three-dimensional solid object using (and therein lies the main difference with the traditional production systems) the addition of material. Traditional production methods are subtractive, i.e. to generate forms from the Elimination of excess material” (3dimpresoras3d, 2013).

3D printing is a technology based on models designed by special software that allows the design or scanning of different objects to define what will be printed. Materials that can currently be printed are varied, can be used from multiple polymers to metals and other firm more materials.

The main problem that they plan to solve by means of the present study is the lack of information about this technology, as well as the scarcity of writings of formal nature on the subject.

This work of collection seeks to present the main features of 3D printing and at the same time the main advantages of this technology and the benefits it has provided to the sectors in which is already used, because today is used in several different sectors and has generated improvements

in productivity by reducing the processing time of the objects and the increase in profits due to the simple process.

Objective

General Objective

Analyze the main advantages of 3D printing nowadays.

Specific goal

Identify the main advantages of 3D printing in the manufacturing industry.

MATERIAL AND METHODS

The present study was based on the compilation of articles, technical documents, blogs, forums, websites and written works related to 3D printing, as well as support material on the dissemination of scientific knowledge. Also a documentary research methodology was used, which according to Mario Pineda, editor of the blog of social sciences, consists of the following phases:

- **Selection of research topic.** When making the selection of the research topic you must choose the area in which you want to investigate. The subject must be of interest and mastery of the researcher.
- It is carried out the approach of the problematic of the area and it looks for a subject that generates interest.
- Based on the knowledge that has been obtained by the student of a subject in the previous stages, he can elaborate a reasoned interpretation that allows him to reach conclusions.
- Another important delimitation to achieve the choice of topic is the extension. The first is to make clear the field in which research is carried out: sociology, ecology, linguistics, and so on. Once the field is established, the object of study is required, being careful to locate it in a place and at a time.
- **Work guide.** It is the work schedule in which the physical record is to be carried out in the manner in which the writing with which the investigation is completed.

- It allows to identify through some analysis which are the main and secondary parts of the problem to solve. You must identify through this writing the information that is important to include in the file and not, so that it is not repetitive.
- **Collection of information.** This phase is where the collection of information on the subject is carried out through the bibliographic and content file.
- Thorough reading of the bibliography implies the serious analysis and interpretation of the data. The most important ideas go to the content tabs, which can be mixed when they contain the author's ideas and the researcher's own reflections and comments.
- The content tabs help to manage the data of the authors and the researcher. They are a very important resource for the preparation and approximation of the first draft of the final work. The organization of the content file and the revision of the scheme are important ways to verify that the research process is correct and not wrong.
- **Final writing of the work.** In this phase the research is concluded, which communicates its results through a written text.

3D PRINTING

3D printing was officially launched in 1986, when Charles W. "Chuck" Hull, co-founder, executive vice president and chief technology officer of 3D Systems, applied for a patent for the Stereolithography (SLA) process, which became the first known method for The creation of three-dimensional objects. While the vast majority of existing processes for creating three-dimensional objects employ a "subtractive" process, the technology proposed by Hull uses an "additive" process. Another of Hull's patents is the STL (Stereo Lithography) file, a three-dimensional model-specific format that allows 3D printers to "slice" the object comfortably and effectively into the individual layers used in actual printing. Most 3D printing models are first created in computer aided design (CAD) software and then converted to STL (News, 2013).

In 2013, Angelica Parrado Sánchez wrote an article on the Urban Cartel website, which mentions that 3D printing was born from a research project that the Massachusetts Institute of Technology (MIT) developed a couple of decades ago. The project consisted of quickly and flexibly materializing parts, prototypes, models and parts that would have been digitized in three

dimensions in a modeling software such as AutoCAD in .STL (monochrome) or .VRML (color) format, for the printer to create Little by little each layer of the piece using sand or a kind of powder that would be subjected to high temperatures, and later to solidify and obtain a texture harder than plastic, as resistant as metal.

The result was achieved and is what we know today as 3D printers, which are capable of creating any shape, practically any material, including ceramic, metal and polymers, having absolute control of the composition of the material, its microstructure and the Surface texture.

Not a few are those who see in 3D printers those wonderful objects they dreamed of in their childhood. There is no denying the astounding potential of these devices to play the favorite toys of just about anyone with enough time and patience. They are amazing tools and beneficial, as long as they are in the right hands.

ADVANTAGES OF 3D PRINTING

According to articles published on the websites 3DSYSTEMS, universia and 3d 3d printers it is mentioned that the main advantages of 3D printing are as follows.

- **RECYCLING.** Scientists have succeeded in developing a machine with the ability to recycle household plastic waste to convert them into work material for 3D printers, that machine is called Filabot and allows by recycling plastic to generate savings in the purchase of ABS .
- **M MEDICAL INDUSTRY.** Technologies such as bio-printing have been developed that help to print organs through cellular tissues, and also have been able to print prosthetics. This application of this technology is one of those that have greater margin of profit because they manage to be an alternative to the high prices of the industries of this sector.
- **HUM HUMAN DEVELOPMENT.** The use of 3D printing is a staggering product of human progress, as these extraordinary tools provide immense ease for small workshops and hardware developers to create all kinds of inventions that could hardly be seen at any other time. Also these tools can help a lot to improve our quality of life.
- **VERSATILITY.** A single printer has the possibility to make a myriad of different products unlike the way it was previously made, because to produce an object there had to be a specific machine, and if the product changed the machine had to be retrofitted.

- **COST REDUCTION.** Production costs decrease because manufacturing times are faster and can be done at home.
- **CUSTOMIZATION.** One of the most attractive advantages is the possibility that each user can design their own articles according to their needs and tastes.
- **CREATION OF A NEW INDUSTRY.** Thanks to this technology new industries will emerge in the production process, that is to say, there will be new products manufactured more easily and also more companies selling templates or 3D Open Source models that are downloaded and can be printed.
- **DECREASE OF MARKETING TIMES.** Production times and cycles are reduced, prototypes are printed more easily until the final objective
- **DEVELOPMENT COSTS REDUCTION.** This technology helps us reduce costs in prototyping because they are no longer done in a traditional way or with the laborious procedures with which they were made before, in addition it allows to identify the errors of design from the moment in which they are being elaborated and Not at the time of marketing.
- **PRODUCTION FACILITY.** Many businesses in different sectors will be greatly favored since the production of the different objects will be faster, for example the jewelery business, because when being able to be printed in wax rings, they simply make the mold in a file and the technological device prints them.
- **CREATION OF PROTOTYPES.** Industrial designers can prototype industrial objects in less time and cost.
- **LOW PRICES.** Printed products will have a lower cost due to lower production costs.
- **PRODUCT AVAILABILITY.** A product can be printed on demand, without the need for storage. This will reduce storage costs and not have any product breakdown as they can be manufactured at the time they have demand.
- **WASTE DECREASE.** The material used is only the necessary one, because given its way of production it does not produce waste so that the amount of waste to be discarded is reduced.
- **CAPACITY TO CREATE EXACT REPLICAS.** Scanning technology combined with a 3D printer will allow us to perfectly replicate objects that we consider necessary or that we simply like, always respecting copyright.

- **CONSTRUCTION.** This tool is also applied in the architecture as it facilitates the construction of buildings and other structures since large-scale prints can be made and by modeling layer by layer. This application is currently being experimented to create structures on non-Earth planets.
- **BIOIMPRESSION.** Thanks to this tool organs and tissues are created with biotin and cellular tissue to be used in transplants.
- **ENERGY SAVING.** By reducing the production time, the energy consumption of the different companies that use this technology is significantly reduced.

CONCLUSIONS

After carrying out the present analysis it is possible to mention that the use of 3D printing has been gradually, but significantly in some sectors of society, and although its use is still not very common, it is very important. In the course of time they have increased their benefits of use, for example, has evolved from a simple design to a medical development, such as the printing of some organ of the body. Therefore, we can say that the development of 3D printers has become necessary.

The advantages that this technology offers us are many since it is being used in different areas, from the medical industry to the production of objects of common use. The use of this tool saves time and costs in any field because due to its manufacturing process the cost of production decreases and any object can be manufactured more quickly. In addition, being economical the materials in which it is printed, the production costs are significantly reduced, not to mention that it allows to make modifications to existing designs according to the needs of each person.

In addition to the advantages to the different productive sectors are also those related to the environment since it has been able to be used in recycled materials. On the other hand, it promotes energy savings because production times will not be as long. Another advantage is that waste that is left after the production process is reduced because only the necessary material is used and nothing is wasted. For all of the above, it is concluded that 3D printers are a technology extremely useful for society.

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