Printing in 3-D

September 25 2007

It is a simple matter to print an E-book or other document directly from your computer, whether that document is on your hard drive, at a web site or in an email. But, imagine being able to 'print' solid objects, a piece of sports equipment, say, or a kitchen utensil, or even a prototype car design for wind tunnel tests. US researchers suggest such 3-D printer technology will soon enter the mainstream once a killer application emerges.

Such technology already exists and is maturing rapidly so that high-tech designers and others can share solid designs almost as quickly as sending a fax. The systems available are based on bath of liquid plastic which is solidified by laser light. The movements of the laser are controlled by a computer that reads a digitized 3D map of the solid object or design.

Writing in today's issue of the Inderscience publication *International Journal of Technology Marketing*, US researchers discuss how this technology might eventually move into the mainstream allowing work environments to 3-D print equipment, whether that is plastic paperclips, teacups, or components that can be joined to make sophisticated devices, perhaps bolted together with printed nuts and bolts.

Physicist Phil Anderson of the School of Theoretical and Applied Science working with Cherie Ann Sherman of the Anisfield School of Business, both at Ramapo College of New Jersey, in Mahwah, New Jersey, explain how this technology, which is known formally as 'rapid prototyping' could revolutionize the way people buy goods.

It will allow them to buy or obtain a digital file representing a physical product electronically and then produce the object at a time and place convenient to them. The technology will be revolutionary in the same way that music downloads have shaken up the music industry. "This technology has the potential to generate a variety of new business models, which would enhance the average consumer's lifestyle," say the paper's authors.

The team discusses the current advanced applications of rapid prototyping which exist in the military where missing and damaged components can be produced at the site of action. Education too can make use of 3-D printing to allow students to make solid their experimental designs.

Also, product developers can share tangible prototypes by transferring the digitized design without the delay of shipping a solid object between sites, which may be separated by thousands of miles. The possibilities for consumer goods, individualized custom products, replacement components, and quick fixes for broken objects, are almost unlimited, the authors suggest.

From the business perspective, e-commerce sites will essentially become digital download sites with physical stores, retail employees, and shipping eliminated. It is only a matter of time before the 'killer application,' the 3-D equivalent of the mp3 music file, one might say, arrives to make owning a 3-D printer as necessary to the modern lifestyle as owning a microwave oven, a TV, or indeed a personal computer.

Source: Inderscience Publishers

https://phys.org/news/2007-09-d.html