4D Printing

Scientists are developing 4D printing technology to pave way for ‘smart’ materials that can change shape by themselves. Imagine buying a dress online that takes shape in front of your eyes in your living room.

Researchers are combining different types of plastics and fibres to create ‘smart’ materials that change shape when they come into contact with stimuli such as heat or water.

How it will work?
Objects designed in this way can expand, fold or unfurl into pre-designed forms after being printed, in a process dubbed 4D printing. Using a scan of the customer’s body, the dress could be designed to fit perfectly and would be created with a series of tessellating segments. A computer model would then compress the design into the smallest possible space to fit inside a normal 3D printer. The customer would simply download the design, print it and unfurl it.

Skylar Tibbits, from the Massachusetts Institute of Technology, is pioneering the research with Stratasys, a digital manufacturing company.

Potential benefits of 4D Printing
1. Using only water, heat, light or other simple energy input, this technique offers adaptive and dynamic response for various kinds of materials. For instance, cloth can be used to manufacture dresses according to the size of a person.

2. The manufacturing would totally rely on machines. Thus, the standardization of quality, price and other attributes of the product will emerge.

3. 4D printing would enable large scale manufacturing at quick pace. Thus, the overall cost of products is expected to decline in the long run.

Potential Disadvantages of 4D Printing
1. Machine-based manufacturing may aggravate the problem of unemployment, especially in the populated countries.

2. The 4D printing of products may shift the manufacturing base from developing nations to the developed nations as the labour needs will get replaced by the advanced techniques and technologies. Consequently, economic inequality may rise in the world.

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