The future of 3D Printing

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February 2014
Introduction

• In 2014 3D printing will be widely available to the public – if they can afford the initial investment

• 2013 already saw growing awareness in 3D printing – and increasing experimentation with the possibilities

• 3D printing exhibitions dominated the International Consumer Electronics Show (CES) in Las Vegas

• 2014 will certainly be a year where businesses test and deploy 3D printing in a range of manufacturing/maintenance roles
What is 3D printing?

- 3D printing creates objects by layering one layer of material above another.
- Most common material plastic, but other materials include metals, rubber, porcelain and foodstuff amongst others.
- While the cost of 3D printers is still a major obstacle to its mainstream adaption, prices are falling rapidly.
- 3D printing has potential to revolutionize manufacturing as we know it.
## Revolutionizing Manufacturing

<table>
<thead>
<tr>
<th>Changing Supply</th>
<th>Changing demands</th>
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</thead>
<tbody>
<tr>
<td>– Spare parts provision</td>
<td>– Mass customization</td>
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<td>– On-demand</td>
<td>– Immediacy</td>
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<td>– On-site</td>
<td>– Cost-Effectiveness</td>
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(Post) Post Post Post-modernism?

• No one knows in how many ‘post’s post-modernity can currently be categorised.

• But if we were to stick to standard ideas of modernity being about the rise of mass-manufacturing, and post-modernity the shift to mass-consumption,

• Then the endless possibilities brought by 3D printing in regard to mass-customization mark a clear shift from previous patterns

• The consumer as active participant in the production process is a natural extension of the co-creation concept
3D printing in perspective

• As technology progresses, it takes less and less time to be adopted by the mainstream

• Given how long it took these to reach the 1 billion benchmark, it will be interesting to see the pace at which 3D printing is adopted

**Years to reach 1 billion users**

- Mobile Phone: 22 years
- Internet: 21 years
- Smart Phones: 16 years
- Facebook: 8 years
2014
Demand explosion from medical device market

2015
2D printer manufacturers will be selling 3D printers under brand names

2016
Bio-printing will cause global debate regarding regulations and ethics

2017

2018
At least seven of the world's top 10 multichannel retailers will use 3D printing technologies to generate custom stock orders

2019

2020

Source: Gartner, Inc.
Medical implications – Short term

- 3D printing of prosthetics
- Especially advantageous in war torn and emerging regions
- Ease of access and commoditization of 3D printing technologies makes prosthetics more affordable
Medical implications – long term

- Bio-printing is the medical application of 3D printers to produce living tissue and organs.

- In 2013, Hangzhou DianZi University was able to print a fully functional kidney – however, only lasted for 4 months.

- Technology will develop faster than people’s understanding.

- Ethical and moral debate regarding regulations, control.
Obstacles to 3D printing

- 3D printing is believed to disrupt a number of aspects of everyday life
- Various ethical, moral, political and religious debates regarding bio-printing
- 3D printing to disrupt intellectual property law as we know it today
- The impact on the employment market is as yet unknowable
3D printing and employment

• Democratise manufacturing

• Counterbalance globalisation trend of outsourcing manufacturing

• Blurring lines between design, manufacturing and retail processes

• Despite the obvious threat to jobs both domestically and internationally, 3D printing may actually serve to both redefine current roles and to create new ones
Moral Panic

- Media portrayal of 3D printing as either fascinating or scary
- Tendency to predominantly focus on negatives
- Focus on misapplication of 3D printing technology
- Debate about personal safety, but most importantly debate on how to control its spread
- Fundamental issue of adapting to changes by new technology and providing a legal framework for safe practice
3D Printing in practice

- Foodstuffs
  - NASA Pizza
  - Barilla Pasta

- Airplane parts
  - Boeing/Airbus
  - Turbines and wings

- Household appliances

- International Space Station
Thank You

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