

Decentralisation of Production with Peter Cochrane

The latest Outsights Next Revolution event focussed on “The Decentralisation of Production” – a revolution which looks at how nanotechnology and biotechnology will live up to their promises, ultimately blurring the line between consumers and producers. Peter Cochrane - technologist & futurist - talked about how developments in bio- and nano-tech and materials technology is making the decentralisation of production increasingly possible and the potential implications for our working and personal lives.

The Decentralisation of Production is the third of the three “Next Revolutions” identified in this Outsights programme, alongside [A New Sense of Identity and Mass Social Action Enabled by Technology](#). All three Revolutions look at how advances in technology interact with society, politics and the economy. Peter suggested that since 1800 knowledge has become increasingly specialised. However, he argued that over the coming years we will be able to harness technology to such a degree that individuals will have all knowledge through technology. Such a situation will enable production to become much more greatly decentralised. For Peter’s full and lively presentation see [here](#). His headlines are as follows.

The New Industrial Revolution

Nowadays everything around us has had some previous contact with machines. Machines are now able to surpass human visual acuity and manual complexity and we have become increasingly dependent on them to help us understand the world around us.

Room at the bottom for development (Bottom up-top down)

Progress is now being powered by machines – it is no longer humans who are discovering and developing new technologies but machines. Machines are now accelerating their power faster than humans ever could and by [2015 machines will have completely taken over humans](#) on a progress level.

We are once again turning back to biology and with the ability to explore smaller and smaller units – a layer one atom thick will allow the development of innovative new devices and materials. As a result, humans will have more power at their disposal. Although atomic manipulation has been a reality for some time we are only just beginning to see it in practice. [The Power of Nanotechnology](#) opens up a world of possibilities such as nanodevices being [able to repair tissues, clean blood vessels and airways](#), replace the insulin-making cells of your pancreas to cure diabetes or detect the early stages of [cancer](#). However, along with innovation we must be aware that there could also be [downfalls](#).

The next hot spot – develop by combining all three

What we should really be studying is the space that exists between Nanotech, Biotech, Artificial Intelligence (AI) and IT. The convergence of ‘dry’ and ‘wet’ science’ - genome, protein, nano, intelligence, robotics, AI + AL with old, and new forms of genetics is where interesting developments and discoveries will be made. Although this hot spot will increase our understanding and capabilities, our dependence on machines, science and technology will also grow.

3D replication

This new technology is now moving faster than ever, and increasing human productivity. It is helping to create parts which are stronger, smaller, lighter, and more durable than ever seen before. They now have the capability to produce a gear box in one piece; this will also help to reduce waste. The use of 3D printers will enable us to reuse our rubbish and recycle them into another product.

Whilst [3D printers](#) are currently too expensive for commercial use. prices will fall – it is just a question of speed, scale and understanding, as with many of the everyday machines we use today. This new ability to programme material to form 3D objects of a predefined shape and function will have great potential for stem cell research, for example.

<http://www.medicalnewstoday.com/articles/154584.php>
<http://news.bbc.co.uk/1/hi/health/1949073.stm>

A new ability to understand complex systems through sheer computational power will transform the pharmaceutical industry and R&D more generally. The human genome is now fully decoded and the next step is to decode the protein stack, thus enabling personalised drugs. This would revolutionise the pharmaceutical industry, making the current model redundant, due to increased knowledge, information and modelling capabilities, with the potential for people to conduct genetic engineering from home.

Humans merge with technology

We can expect people and technology to [merge](#) in order for humans to understand anything around them. No individual has the understanding of all areas of development, with the trend towards specialisation limiting our knowledge, the only way in which we can know everything is if we combine with technology.

Some have attempted to [improve their brain functioning](#) - for example the US military using a process of brain enhancement to increase soldiers' IQ by 20 points. However whilst this may make aspects of the brain and reception sharper, it does not expand the knowledge base and only has short term effects.

In conclusion there is an opportunity to change every aspect of human life; it is just a question of whether we are smart enough to take full benefit.