

Post-scarcity: Moving into a New Age of Living

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Imagine a world in which poverty and disease are non-existent, material goods such as food and clothing are freely available, and individuals are free to devote their time to whatever they pleased. This is the setting portrayed in Iain Banks' *The Culture*, and explored in countless other science fiction novels. Post-scarcity, a scenario in which material goods are essentially free, is heralded as an utopian era that is almost upon us, perhaps as early as 2045 [1]. How plausible is a post-scarce world, and what implications does it have on our way of life?

Scientific and technological advances have provided vast improvements in production efficiency throughout our history - take the combine harvester, the power loom, and more recently, injection moulding as examples. These inventions have liberated more time for leisure and ushered in new eras of prosperity. We already have glimpses of the kind of technology that might make post-scarcity possible.

Drinking water has long since become post-scarce in countries such as the UK and America. For developing countries, this was not the case, with over 21% of communicable diseases in India being water related. The LifeStraw, a portable water filter the size of a large pen, was introduced in 2005 [2]. Retailing at \$2 and capable of filtering 18,000 litres, it is being mass-distributed in developing countries, providing the population access to abundant, clean drinking water.

3D Printers are already operating on industry scale and are making their way into the home [3]. These are reminiscent of the matter compilation technology in Neal Stephenson's *The Diamond Age*: machines that are able to assemble basic molecules into everyday objects.

In the digital realm, we are already operating in a post-scarce environment. It is impossible to 'run out' of digital copies - one can simply make another copy of the file, free of charge. So it is to the Internet that we turn in order to study the significance of such a scenario.

Post-scarcity on the Internet

Digital media are the best example of post-scarcity in operation. YouTube, MegaVideo, Wikipedia and many other shared sites offer an endless stream music, literature, knowledge and entertainment, often free of charge. There are no shortages of virtual goods the internet - no waiting in line for the new album release, thanks to iTunes, or scouring the library for one copy of a research paper, using online databases.

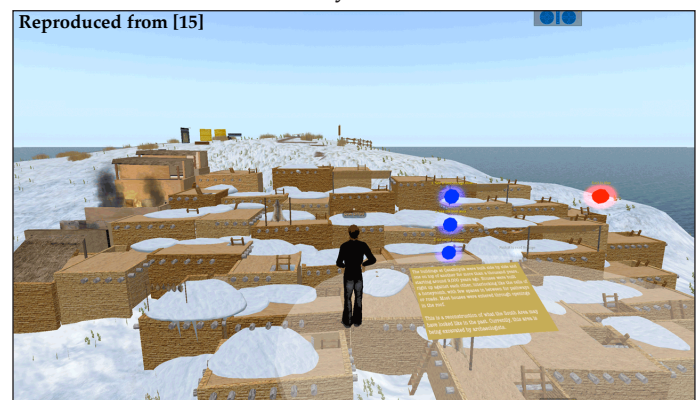
The ease of access to information, content and services is revolutionising the way we live, and it is not only entertainment and knowledge that have become post-scarce. From early internet forums (the Bulletin Board System) to the immersive role playing games available now such as *Second Life* and *World of Warcraft*, it has become possible to form online communities. One can meaningfully interact with a great number of people, unbounded by geographical constraints. Especially with online games, a great majority

of our psychogenic needs proposed by psychologist Henry Murray such as play and recognition can be fulfilled [4]. At any point during the day, a *World of Warcraft* player can complete a quest, acquire rewards and respect. Personal fulfilment has never been so readily available.

“ One can meaningfully interact with a great number of people, unbounded by geographical constraints ”

Post-scarcity poses a dilemma to distributors dealing in digital goods. Beyond the creation of the first unit, the costs of producing every additional unit is effectively zero, barring negligible transmission and storage costs. The CD of Jason Derülo's *Whatcha Say* single can be purchased in HMV for £7, whereas the digital copy is available on iTunes for 99p. Similarly, Amazon's Kindle ebooks retail at a significantly cheaper price than that of the same paper book on their website. The fact that it costs nothing to duplicate data makes pricing somewhat arbitrary and begs the question from consumers, 'If it doesn't cost anything to copy a song or film, why pay for it at all?' This has led to the proliferation of digital piracy through file-sharing - the most infamous being the torrent tracker website, *The Pirate Bay*. The trafficking and distribution of such content, known as 'Warez', is done by pirates who obtain a copy of the media item and converts it into a distributable format which is then eventually made publicly available across the Internet. The MPAA (Motion Picture Association of America) ran an infamous anti-piracy campaign proclaiming, 'You wouldn't steal a car, you wouldn't steal a handbag, you wouldn't steal a television, you wouldn't steal a movie', accompanied by a gritty soundtrack and ominous setting. The standard retort, 'Well, I would steal a car if the person I stole it from still had their car,' encapsulates the issue at hand.

It is estimated that digital piracy sites experience more than 146 million visits a day and in 2009 [5], the software



Snapshot of Secondlife.

industry claimed to have lost more than \$51 billion in profits. The RIAA (Recording Industry Association of America) wages an ongoing war against music pirates, advocating copy protection so that once purchased, music cannot be copied. Although some artists are often happy that their work is distributed this way as a free form of promotion, many others share the opposing view. Heavy metal band Metallica notably expressed theirs when they successfully sued the peer-to-peer file-sharing network, Napster, which had been freely distributing the band's discography.

A Transitional Phase

The over-abundance of goods due to the efficiency of production is not a new concept in the physical world. In competitive markets operating on demand and supply, prices of undifferentiated goods can tend to a minimum along with their costs of production, making such businesses unprofitable in the face of post-scarcity.

Traditionally, businesses have sought to create brand recognition in to attain some monopoly power on their specific product - for example, Panadol (paracetamol) and Bayer (aspirin) can be sold at much higher prices than chemically and functionally identical unbranded counterparts because there is differentiable demand between the two. Businesses have also set out to induce artificial scarcity, either through limiting the supply and thus fixing the price of their product at profitable levels, or through planned obsolescence, which is the practice of designing a product so that it breaks down, falls out of fashion, or becomes unsupported after a certain time period. Many items such as iPods have an irreplaceable lithium battery built in which provides 350-500 charge cycles. Many often than not, owners have to buy a new device after the battery runs out. Computer company Intel recently attracted controversy in when they introduced a processor with locked performance [6]. Only after paying \$50 for an 'upgrade card' can buyers unlock the extra processing power. Intel fixed the scarcity of processing power, despite being capable of supplying the extra power at the base price.

Post-scarce goods are necessarily free goods. Amidst the lavish brand advertising campaigns and questionable pricing tactics, a new business model is on the rise. The term 'freeconomics', coined by Wired magazine editor Chris Anderson [7], is used by businesses that provide goods and services free to one party whilst receiving monetary payment



Reproduced from [16]

from another. Google provides free web searches (amongst a host of other services) in return for the revenue generated from their AdSense advertising service. Freeconomics has been operating even before the internet - radio stations allowing listeners to tune in for free are sustained by airing ads between programmes. Spotify is able to offer on-demand music using the same model, but allows users even more freedom. By paying a fee, advertisements can be removed and the consumer is able to stream higher quality music.

Overall, businesses are changing so that money is no longer the only medium through which goods and services can be exchanged. Consumers have more choice in deciding how to pay. We are able to consume 'free' goods in exchange for the time and effort expended absorbing advertising exposure. An economy in which the meaning of 'free' is even less constrictive is also optimistically becoming more prominent.

The Gift Economy

Returning to technology, we examine the beginnings of the free software movement: the GNU project [8]. Started by software freedom activist Richard Stallman, the initial goal of the project was to develop 'a sufficient body of free software [...] to get along without any software that is not free.' This eventually led to the development of Unix, an open-source operating system. Today, masses of open-source software, libraries and tutorials are now available on the web. Free and open-source software are also gaining popularity on their propriety counterparts. Since its introduction in 2003, open-source browser Firefox now commands 30% usage share compared with Internet Explorer's 44% [9]. The GNU project is a prime example of an information gift economy - where services such as programming aren't done for non-monetary profit, but are instead performed for more intangible 'payment' such as reputation and personal satisfaction. With money taken out of the equation, this new currency of exchange is taking its place.

Scientific research is another form of an information gift economy. Findings are published in science journals that are accessible to others in the community. Research is generally undertaken due to personal interest and prestige, rather than monetary gain. In fact, over 20% of Cambridge's natural sciences undergraduates, despite paths to lucrative jobs such investment banking or consultancy being open, stayed on for a research degree in 2009 [10].

An information gift economy has its own society with distinct manifestations of social hierarchy and status indicators. On most internet forums such as open-source software (and indeed on Warez websites) operates a reputation system. Each member is allocated reputation points that can be awarded to or deducted from fellow members as they see fit. 'Reps' may indicate an agreement or gratitude, while 'negs' convey the contrary. Post counts serve as a similar incentive to contribute so that members with high reputation and post count are considered to be in the social elite.

Another attribute in the virtual community is the '1% rule', also known as participation inequality [11]. The theory is that in a virtual community, only a small proportion (~1%) of the users will contribute content. It is estimated that 0.003% of Wikipedia users contributed about two-thirds of it's content [11]. The non-contributors are colloquially known as 'lurkers'. However, the social stigma associated

with being a lurker is much less so than, say, a national resident seeking illegitimate welfare. It costs the same to supply post-scarce digital content to the core community and it's outliers, whereas this is not the case with money.

Imagine a community in which 99% of the population are not required to work, nor are they derided for doing none. The evidence of the existence of gift economies in a post-scarce environment may well satisfy the condition that 1% of the community will sustain such a society.

“ In a virtual community, only a small proportion of the users will contribute content ”

A Brave New World

As of now, the country is going through its post recession hangover with the lowest graduate employment confidence in 15 years [12]. In the UK alone, millions of people are still living in absolute poverty. Talk of over-abundance is perhaps too rich a topic to bring up in light of the current situation.

Enthusiasts for post-scarcity are clamouring for the technological singularity, a hypothetical situation in which technological advances progress at such a rate that the future of humanity becomes unfathomably changed [13]. Such explosions of enlightenment may come from molecular nanotechnology or the application of quantum computing. Scientists tend to dismiss such views as fantastic, but world-changing scientific discoveries have always been unforeseen. Elements of post-scarcity have already made an appearance in our lives and it is expected that as technologies advance, more and more aspects of living will adhere to this new type of economy. The shift to a new age will be a gradual one.

The possibility of a totally post-scarce world, however, faces some glaring issues. The depletion of certain natural resources, for example fossil fuels, is inevitable. Historically, over-abundance is kept in check with a negative feedback loop - with more supplies comes more mouths to feed. Finally, when Earth runs out of room to keep her population, physical space will be a scarcity indeed. Perhaps some incredible social engineering, or breeding limitations imposed by a powerful world government could address the overpopulation issue.

In science fiction, post-scarcity is frequently portrayed in a dystopian setting as well. Soma is a fictional drug used by inhabitants of Aldous Huxley's *A Brave New World*. It



Poverty remains a big issue in the UK.

is a government-issued hallucinogen that allows users to take pleasant 'trips' of varying intensity without a hangover. Non-drug analogues that facilitate escapism already exist today in the form of YouTube, daytime television and other mindless entertainment. With even more immersive simulations (Microsoft's Kinect) on the way, are we in danger of losing our creativity, curiosity and tenacity to instant gratification?

Pixar's *WALL-E* depicts humans as obese and lethargic as a result of being over-pampered by technology. In a post-scarce world lacking in constraints and obligations, the opportunity for excess self-indulgence poses dangers that stem from the very nature of humanity. Firstly, whether technological convenience will erode the social skills required to interact with other people and form relationships. Cracked writer David Wong cynically notes, 'peacefully dealing with incompatible people is crucial to living in a society. In fact, if you think about it, peacefully dealing with people you can't stand is society' [14]. Secondly, in the pursuit of happiness, whether our post-scarce lifestyle will create any kind of irreducible dissonance with our evolutionary hard-wiring. As technology progresses, such issues will need to be addressed.

We have seen that with the disappearance of scarcity, new economies may emerge and with them, new societies. In the increasingly post-scarce future, what kind of world will we live in? In order to truly mould the next age into a utopia, a combined effort from science, technology but also the fields of humanities will be required to forge a sustainable society. A brave new world awaits. ■

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