




Can Open Source Save the World?

The challenge to the traditional economy by open source models of production.

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Abstract

Since Richard Stallman, his Free Software Foundation's vision of a wholly free operating system and the harmonious marriage between the FSF's work and Torvalds' Linux kernel development a new production paradigm has emerged. From GNU/Linux transpired the foundations of the open source movement ever present in modern society. Free(dom) software development and the open source ideology of the ability to freely improve upon an existing product and redistribute it for a larger benefit is transforming the way we use and interact with software, information resources and the web.

Through the use of open source methodologies, free(dom) software and with very little effort, knowledge or capital input individuals can now collaboratively produce products and reach markets that only large companies and corporations could previously. Thus it is providing a step up for small time producers and individuals to compete with well established businesses but at the same time threatens the traditional market based economy. Organisations such as YouTube and MySpace are founding a new form of business that circumvents the attack on the economy and utilises the urge to mass collaborate. Termed Wikinomics, this new business model creates an added value to their services and has proved to be extremely lucrative for their founders. Traditional business models face the threat of becoming outdated and obsolete when trying to compete with the new age of collaboration with un-savvy businesses facing an uncertain future in the emerging networked economy.

This thesis will strive to outline the problem that open source inadvertently poses on the economy. It has the potential to facilitate an economic meltdown giving way to an entirely free world where organisations would find it impossible to compete. However a select few are pioneering in an emerging networked economy by utilising open source methodologies, producing better end user driven content, goods and services as a result. Others must take heed in order to save the modern global economy from falling at the first hurdle.

Introduction

The long standing economic models of production were tried and tested methods of producing goods and services in the traditional economy. Hierarchical, self contained, inwardly facing companies could successfully produce these goods and services 'in-house' using their own employees and trusted lists of suppliers. These were key methods of producing goods to the market standard and required financial investments that only companies could justify. The traditional economy was a highly secretive and guarded environment where competition was key in advancing markets. There was good reasoning for this as it was the only way in which an individual organisation could succeed. Unfortunately for some, this is a dying era.

The information revolution is now upon us. The advent of the modern internet has facilitated the ease of networking on social and economical levels. Services such as MySpace and Facebook are growing ever popular and instill the mass collaborative and networked ethos into the masses¹. Individuals can not only form networks of their peers but can collaborate on mass scales to produce information, knowledge, goods and services. These collaborative efforts are aided by the plethora of free and open source tools to a point where they challenge traditional production methods. They are threatening the ability for businesses and organisations to compete and make a profit in the modern economy, and yet, the outdated dichotomy of the traditional economy is still held by a large number of them.

This thesis will examine the threat that open source methodologies and the emerging modes of production pose upon the traditional economy exploring how the new paradigm of the networked economy should be adopted in order for economy to advance. It starts by explaining

¹ **Facebook** (<http://www.facebook.com>) is a social networking website that users can connect with their friends and others based on networks of people from academic institutions, areas of the world or dedicated groups to a particular subject.

MySpace (<http://www.myspace.com>) is a social networking site "offering an interactive, user-submitted network of friends, personal profiles, blogs, groups, photos, music and videos" (Wikipedia: MySpace) (<http://en.wikipedia.org/wiki/MySpace>)

what is meant by the terms 'free software' and 'open source' and the fundamental differences between them that are often confused. Continuing into a potted history of how the open source principles and methodologies that form the emerging models of production evolved from the free software movement; using these as further understanding for the terms. The following chapters discuss the way in which the traditional economy operates compared to the emerging networked economy and the threat that open source production poses on traditionally operating organisations. Following this are a series of case studies that follow the pioneers in the utilisation of open source production and open innovation, focusing on the various ways in which these have been implemented. This should give substance to the argument for open source as part of the modern economy with each case study proving their success in advancing away from the traditional economy.

Open Source?

This chapter will summarise what is meant by the terms ‘open source’ and ‘free software’ and the principles in which they stand for respectively by outlining the history of both free software and the open source movement. It is imperative that the differentiation between the two terms is fully understood as there is a lot of confusion surrounding the subject. Once this is comprehended it will form the basis of understanding for what is meant by open source as a business model and the ways in which it can be utilised to a greater effect.

The term ‘open source software’ is a widely used misconception. It was coined by the members of the software sharing community as an alternative way of referring to software that is free. However, the term ‘free software’ is also widely misunderstood. Due to the ambiguity of the word ‘free’ it is hard to communicate what the term is referring to. In most cases this term is understood as software that is gratis, given without charge, referring to price, this unfortunately couldn’t be further from the truth. According to Richard Stallman (founder of the Free Software Foundation) free software refers to software that is free as in freedom, software that conforms to a set of principles that liberates the user’s freedom in running such software for whatever purpose the user sees fit, improving the software or modifying it for a bespoke purpose. For this to be possible the source code of the program must be freely available and the user must have the freedom to distribute the original or the modified version for the good of the community (Stallman 2002: 18). On the contrary to most people’s understanding of free software, the distribution of the software for a fee is encouraged as this provides capital for the further development of free software and facilitates the sustainability of the community.

It is due to the aforementioned misunderstanding and a ‘fear of freedom’ (Stallman, 2002: 57) that the term ‘open source’ came into being. It was favoured to avoid the confusion of the word ‘free’ when talking or writing about free software but this term explicitly refers to the fact that free software has openly available source code and disregards the other principles that define free software. Furthermore the word free(dom) evokes ethical issues and responsibilities

which at present are avoided in order to promote open source software into a more business friendly environment. Stallman states that there is not a single word within the English language that covers this subject successfully without any potentially confusing alternatives. He hints at the word 'unfettered' as one that has the closest meaning but this still does not solve the confusion (2002: 18). Today there are clear definitions of both 'free software' and 'open source' made by the respective organisations that preside over them². However, these definitions are unsurprisingly similar and for the purpose of this paper the difference between them lies in the physicality of what they represent. Wherever the term 'open source' is used within this paper, it is used referring to the free software principles and ideology that define the purpose of such software or practices.

The open source ideology of a sharing community is 'as old as computers, just as sharing of recipes is as old as cooking' (Stallman 2002: 15). However the Open Source movement we see today originated from a sharing community within the MIT Artificial Intelligence lab in the 1970s. Stallman and his co-workers at the lab would share their source code with each other and other universities and companies whilst developing the timesharing operating system they used on their Digital PDP-10³. Any interesting or unfamiliar source code that another programmer had written could be read, changed and used to make another program with no license infringement (Stallman 2002: 15). In the early 1980s the community was disbanded when the AI lab hackers were hired away and was not able to continue. The AI Lab then purchased a new PDP-10 and decided to use the proprietary operating system from Digital thus rendering the use of the code in other programs a violation of the non-disclosure agreement. A few years later the PDP-10 was discontinued along with its architecture which rendered the timesharing operating system that the AI Lab hackers had worked so hard developing completely obsolete. All other computers of the era came with their own operating systems which were all proprietary software in which a non-disclosure of source code agreement had to be signed in order to get a copy (Stallman 2002: 16). Stallman entertained the idea of joining

² The Free Software Foundation (<http://www.fsf.org>) and the Open Source Initiative (<http://www.opensource.org>)

³ A mainframe computer manufactured by Digital Equipment Corporation (DEC) from the late 1960's. It became popular with the hacker community of the era after the adoption of PDP-10s by computing research labs.

the proprietary software developers but decided that this would be a violation of his beliefs towards what software should be and so he set about developing a completely free and open operating system that would facilitate a new 'community of cooperating hackers' (Stallman 2002: 17). It was to be designed for the UNIX system for ease of use and so users could port to it; this gave way to its name, the GNU system (Gnu's Not Unix). In 1985 Stallman set up the Free Software Foundation 'a tax-exempt charity for free software development' (Stallman 2002: 21). Apart from being a means to develop free software and utilise talent from around the world, the FSF provided a much needed income from donations to the cause and the sales of free software. The foundation's employees write and maintain numerous different GNU software packages that contain different free tools and programs that in one way or another have contributed to the GNU project goal of completing an entirely free operating system (Stallman 2002: 21).

In 1991 Linus Torvalds started developing the Linux kernel which utilised many of the GNU operating system libraries and utilities hence the name given to the finished operating system of GNU/Linux. Torvalds shared the operating system with programmers over and online bulletin board and out of the first ten people to use it, five made substantial changes. Due to the success of these changes in improving the functionality of GNU/Linux, it was licensed under a GPL (general public license) making it free to use and develop as long as it was shared within the community (Tapscott 2007: 24). Today this operating system is the most popular and widely used distribution of free or open source software and is the base operating system of a wide variety of computer architectures and devices; the majority of which being servers with eight out of ten of the world's most reliable hosting companies running Linux (Wikipedia: Linux)⁴.

The popularity of the free software movement has been accentuated by the success of Linux and there are calls for major proprietary giants such as Microsoft to embrace the open source ideology not just on the software development front but in other fields such as knowledge production. Unsurprisingly these have been met with reactionary statements that the

⁴ Article on Linux. URL: <http://en.wikipedia.org/wiki/Linux>.

facilitation of a global sharing community is threatening 'the ability to make profits in knowledge-based industries such as software' (Tapscott 2007: 16). However, collaborative communities such as Wikipedia, YouTube and Flickr have already proved that the mass collaboration of the world's internet users can prove extremely lucrative for anyone who realises the potential⁵. With the recent sale of YouTube for \$1.65 billion to internet giant Google (Geist, 2006) it makes a point of how powerful the collaborative efforts of people on a large scale can be. The example that Tapscott uses of the regeneration of Goldcorp⁶ using open source practices also outlines how rewarding mass collaboration can be. By open sourcing their geological data via the internet and inviting the public to collaborate on finding new gold deposits within their site they single-handedly produced a 600% drop in their outgoings and an increase of \$8.9 billion to their yearly turnover. This process not only harnessed some of the most talented minds all over the world, which in the previous guarded environment would not have been possible, but liberated a 'highly secretive industry' (Tapscott 2007: 9). These powerful examples of successful 'open sourcing should compel the economy to take another look at the dominant paradigm of productivity that is so strongly held (Benkler, 2002: 3).

In summary, the term 'open source' is an umbrella for an ideology of a set of principles that apply to user generated content whether that be content generated as source code for free software or whether that be content in the production of knowledge, goods or services. This ideology can provide a successful business strategy which extends an organisation's talent pool further than ever before. 'Regardless of how smart, creative, and innovative your organisation is, there are more smart, creative, and innovative people outside your organisation than inside' (Goldman & Gabriel, 2005). It is this business strategy that has evoked the recent emergence of a shift in economic models from the traditional market based model to a new paradigm of

⁵ **Wikipedia** (<http://wikipedia.org>) is a free open source encyclopaedia that anyone can contribute to or participate in generating its content.

YouTube (<http://www.youtube.com>) is a video sharing website where all the video content is user generated. It enables individuals and small producers to broadcast their content.

Flickr (<http://www.flickr.com>), a photo sharing website with a similar concept to YouTube in that users can submit their images to be published on the web for others to view and comment upon.

⁶ A gold mining company based in Vancouver, Canada. Now one of the world's largest gold mining companies, aided by the use of open source practices.

networked individuals working together outside of an organisation. The following chapters will describe the threat that the open source ideologies pose to the economy and how individuals are threatening traditional production and the ability to make a profit in the traditional economy. They will also offer solutions to this threat and ways in which organisations can not only embrace this emerging paradigm but facilitate its growth as the emerging modern economy.

Networked Economy

The previous chapter summarised the development and definitions of the FSF and the open source movement in order to lay foundations for the rest of the essay and to introduce the principles behind the open source ideology. This chapter will outline how the traditional economy operates and how the outdated models compare to those of the emerging networked economy or as Benkler states, a new mode of 'commons-based peer production' (2002: 1). The networked economy has emerged from the development of these open source practices and has been facilitated by the power of today's communication and information infrastructure challenging the traditional economy's modus operandi. The threat that this poses to organisations who do not acknowledge this change is large and their competitors who embrace the networked economy will undoubtedly succeed and grow. This reinforces the argument for utilising open source methods and mass collaboration as part of the modern economy. Later in the chapter this threat is expanded upon and solutions to avoid the threat are offered.

In his 1937 paper 'The Nature of the Firm', the Nobel Prize winning economist Ronald Coase stated that an individual can contribute to the conventional and long established economy in one of two ways: an individual can either be an employee of a company following directions passed down through a hierarchical structure above them or act as part of the market following price signals. This outdated dichotomy of economic modes is still held by many economists and global firms, however, over the last four or five years focus has been drawn to the successful rise of the FSF and the free software flagship GNU/Linux described in the previous chapter. More specifically the focus has been on the way in which open source projects are conducted and how networks of producers can challenge the traditional economy as the principal engine of production (Tapscott, 2007: 55). This raises the question of whether Coase's models are still entirely valid within the modern economy. However, they cannot be entirely dismissed but an expansion of the law to encompass a third mode for the networked economy is in order to embrace the emerging peer production model. In the 1930's, Coase visited the two industrial giants of the era, Ford and General Motors. He saw the gargantuan hierarchical and somewhat

‘stalinesque’ structures of these manufacturing firms and questioned why individuals organise themselves in such a manor, ‘why don’t individuals act as individual buyers and sellers...?’ (Tapscott, 2007: 55). He deduced that this was mainly due to the fact that information comes at a cost. The information in question for such firms are the sourcing of parts and materials, the contractual information for supplying the materials and management of the operation. He broke this down into three different ‘transaction costs’: search costs, contracting costs and coordination costs. These encompass the expenditure involved in utilising information and services to produce a product from either outside or within the firm. Summarised by Tapscott, Coase’s theorem states that a [manufacturing] firm will grow until the costs of transactions carried out ‘in house’ equal that of the costs of transactions carried out on the open market⁷. In other words, when it is cheaper to do something within the firm, keep it there. If the opposite is true, take your transaction to the open market (2007: 56). This is seen as a basic description of how conventional hierarchical firms operated within the traditional economy.

However, the advent of the modern internet (web 2.0) has assisted the ability to network and collaborate on a scale such as to invalidate Coase’s theorem as an explicit description of the modern economy. The transaction costs of sourcing goods and materials for the manufacturing sector are cut dramatically by links to industry exchange services, similarly for contracting and organisational costs with a majority of the administration taking place over the internet. The information revolution has permanently distorted the traditional methods of conducting business with the sharing of previously costly information being changed into an inexpensive and instantaneous practice. The formation of ‘business webs’, networks of collaborating businesses, facilitates the ease in which supply information is opened up unto participating firms thus forming a collaborative effort towards a networked economy.

The advent of the networked economy has had its most profound effect on the knowledge, information and cultural industries. This is due to the ease in which these goods and services are created. In the modern environment all that is needed to produce such goods is ones

⁷ The size of a firm is determined by how many internal transactions are carried out compared to external transactions.

‘creativity, a computer and an internet connection’ (Tapscott, 2007: 68). The reliance on capital firms and markets to produce and distribute knowledge and information has all but dissipated. As Tapscott states, ‘...a growing proportion of the things we value...can now be produced by us or in cooperation with the people we interact with socially-simply because we want to’ (2007: 25). The free software movement has helped to instil this peer production ethos in to the mass public. Software developers do not work to hierarchical directions nor do the projects rely on markets to succeed (Benkler, 2002: 4). Stallman’s motivation for creating the GNU project came from the frustration of conforming to restrictions set by companies in order to corner markets and as with all free software developers, he participated in these projects without any direct monetary appropriation or gain. Free software developers participate because ‘they want to’ rather than ‘they are told to’. Torvalds states that “People just self-select to do projects where they have expertise or interest” (Tapscott, 2007: 69), people contribute to a certain project because they are passionate about a particular subject matter. Wikipedia is a prime example of this point. Individuals expend large amounts of their free time administrating and curating articles in a particular field because they have a certain expertise or passion towards the subject. For software developers the ‘hacker’ ethic of ‘all information should be free’ replaces the monetary drive with a motivation to produce liberated resources and information for all. These motivations are not sufficient for people to participate in such projects however. Tapscott points out that there a number of ‘intrinsic and self-interested reasons’ (2007: 70), depending on the type of person participating and the nature of the project. Mostly, motivation in such projects comes from a personal need for exposure. The majority of contributors to the FSF and the OSI and indeed the ongoing development of GNU/Linux distributions have jobs within companies in the industry. Their participation in these projects gives them knowledge, experience and facilitates their network of knowledge producers and contacts as well as heightening their status within the community and aiding their careers (Tapscott, 2007: 70). Coase could not have foreseen that individuals would openly contribute to the economy in such a manor without any direct traditional influence or motivation. Although Coase’s theories are still valid it is important to recognise this new networked model of production as a third mode in the Coase theorem, updated for networked global economy.

As touched on previously, the age of the information revolution has provided individuals with a mode to act in a way that fulfils Coase's questioning as to why they self organise into firms. Free (as in cost and also as in freedom) resources such as open source VOIP (voice over internet protocol), social networking services, Wikis and free software packages are allowing networked individuals to collaborate on a scale never before seen. Individuals can now act as individual 'buyers and sellers' or producers, authors and 'prosumers' (a term coined by Tapscott to describe the new generation of consumer producers who actively participate in research and development programs and improve the products by 'hacking' them to their specific needs). These individuals have already proved that their efforts can threaten and even better production by long established cornerstones of the economy. Again, Wikipedia is a prime example of this. Started in early 2001 and using the voluntary efforts of the world's internet users, it quickly became the largest encyclopaedia in the world. At the time of writing, Wikipedia is noted as having 'over 10 million articles in 253 languages' (Wikipedia: Wikipedia)⁸ and is offered completely free. Although there is much speculation over its validity as a scholarly source and its previous use as a propaganda aid⁹ it is still widely regarded as the most comprehensive information resource in the world. This alone is a large enough testament of the power of collaborating individuals with a passion for a particular subject as their only motivation. Wikipedia constantly threatens traditional information resources such as newspapers and traditional encyclopaedias with numerous examples of breaking news reports appearing on Wikipedia hours, even days before they are published by traditional forms of the media. Reports of the transportation bombings in London, 2005 were appearing on Wikipedia minutes before the first news report reached broadcasters. By the time the American public were waking up to the news, contributors had compiled a full and extensive report of the events under the Wikipedia article, more comprehensive than most broadcasted reports at the time. Similarly, the death of Andrea Dworkin, the American feminist protester and writer, was

⁸ Article on Wikipedia. URL: <http://en.wikipedia.org/wiki/Wikipedia>

⁹ Wikipedia is said to be a constant target for Organisations to fabricate information regarding competition and individuals. Similarly it is used by individuals to express biased beliefs towards political figures; the article on George W. Bush has been under constant 'surveillance' during his presidency and since the 9/11 attacks. (Wikipedia: Wikipedia)(see footnote 8)

published on her Wikipedia biography 24 hours before the first major news outlet was notified by her agent. Although these claims are regularly 'flagged' by Wikipedia officials as bold claims without substantive evidence, this nevertheless demonstrates the abilities of the contributing mass audience.

Another obvious application of mass collaboration and open source is through research and development programs. Empowering the public to become part of the development of a project or product can harness the plethora of creative and technical minds outside of the organisation that previously could not be reached. People will freely participate in improving a product that is relative to them as this offers them the chance to tailor it to their specific needs and have an input into the products that they consume. Equally the active 'prosumer' will see a new product as a chance to 'hack' it in to something more relative or more useful to them. These prosumer hacks can often lead to a future for a specific product, pointing the possible directions and advancements in which markets can take. Prosumerism also enables consumers who produce the products in which they consume. Tapscott uses the Linden Labs RIA (rich internet application), Second Life as an example of a tool that empowers prosumerism in such a way¹⁰. He also points out that some of the more advanced users of Second Life form networks not dissimilar to business webs in which they share information on the prosumer products that they have created, collaborate on other projects, engage in financial transactions (via the Second Life native currency, Linden Dollars, L\$) and exchange product hacks (2007: 126). With the current ability to exchange Linden Dollars into US Dollars at a rate of approximately 250L\$ to the US\$, Second Life potentially threatens not only research and development schemes but possibly the traditional market place.

The threat that the emerging networked economy and the utilisation of the open source ideology poses to the traditional economy is very real. It not only threatens the way in which it operates but also threatens the ability to make profit in the modern economy as a traditional

¹⁰ **Second Life** (<http://secondlife.com>) is an internet based virtual world where people can build characters (or avatars) and live a 'second life'. The environment is created entirely by the residents (users of the game) including, shops, real estate products, goods and services.

organisation. The new paradigm is a positive step in the right direction for the economy as a whole and therefore should not be avoided. Instead companies should adopt methodologies and technologies that facilitate the embracing of the open source ideology. Of course there have been many success stories to date with many of the world's largest organisations already broaching the subject of open source and the networked economy and these shall serve as steadfast examples of how other companies can approach the subject. The following chapter will look at some of these pioneers in more detail in order to serve as a benchmark for others to take heed.

Pioneers in the New Paradigm:

Connect and develop, Crowdsourcing and middle men.

In the emerging collaborative age where networked individuals can easily and cheaply challenge long established organisations in cornering markets as well as the quality and usability of the goods and services they can produce there is a valid threat to organisations that do not embrace or at least acknowledge collaborative efforts as a intelligent method of retaining their established place within their market. This also poses new opportunities for the savvy organisations who can count on mass collaboration to better their value to consumers and their stakeholders¹¹.

There are many ways in which an organisation, regardless of their market, can utilise open source methodologies and mass collaboration. This chapter will examine, using short examples, various companies and organisations that have recognised collaborative production as a successful business strategy so to reinforce the argument for open source practices in the modernisation of the traditional economy.

1. Procter & Gamble: Connect and Develop.

Procter & Gamble is one of North America's largest (by revenue and by profit) 'fortune 500' companies. The famous 'brand aggregator' owns at least 250 brands in six main categories: laundry and cleaning, paper goods, beauty care, food and beverages, feminine care and health care. Originally working in the specialist chemical sector, P&G frequently acquire brands in other sectors to reach other markets with its products. Traditionally they would rely on in house innovations, abilities and a network of trusted suppliers to invent, produce and distribute new products to the marketplace. All of their innovations in product development, packaging

¹¹ Value is measured differently by different types of people. For consumers, some may value price, quality, service or environmentally friendly products. On a corporate level value is measured depending on the type of organisation concerned. Profitable companies will promote value to their shareholders as financial gains and increases in stock value but for non-profit organisations value can become more complicated to measure. They can define value as 'good service' or for health trusts value can be 'lives saved' (Derby, 2006: 5).

and marketing and research methods were regarded as highly secretive and were protected from the competitive marketplace.

In 2000, P&G realised that their innovation budgets were under strain to maintain their position ahead of the competition, with constant technology advances and an increasing number of smaller organisations innovating in sectors that they could not. In order to satisfy their shareholders, P&G set an incremental growth percentage of between 4-6% per year, however, due to the size that they had reached, that equated to around a \$4billion increase in their gross profits year-in year-out (Huston, 2006). This presented a problem to P&G, their long established 'in house' research and development programme was failing them in the increasingly modernised economy and their stock value dropped from \$118 to \$52 per share. Their answer came from their newly appointed CEO A.G. Lafley.

Taking inspiration from IBM's move to utilising open source techniques in their innovation and development programmes, Lafley challenged P&G to 'reinvent their innovation business model' (Huston, 2006). Due to the nature of their operations in the past P&G knew that their best innovations had come from collaborating ideas and networking their internal companies and brands. They could, however, establish the same networks and innovation exchanges without first acquiring the company and incurring more expenditure. This formed the basis of their 'Connect + Develop' programme. The system opens up P&G's in house innovations in trademarks, technologies, engineering solutions, business services and market research methods for other companies to use in exchange for innovations and solutions to problems that they publish on the 'Connect + Develop' website¹². In the first two years of the programme, P&G released more than 100 new products with some collaborative aspect from outside the organisation, their R&D expenditure has been substantially reduced, they have doubled their share value and today have an impressive portfolio of over twenty two brands grossing over a billion dollars each.

¹² <http://www.pgconnectdevelop.com>

P&G's 'Connect + Develop' approach to open source methods mostly aspires to acquire innovations from other companies much like a business web. It serves as an example of how business webs can be opened up further so that any company can potentially become an innovator in P&G's products. Furthermore 'Connect + Develop' also encompasses the talents of individuals and welcome any innovative submission to their problems. This is a very good example and testament of open source methodologies in business as P&G have founded an extremely effective method of harnessing talents not only of individuals but of whole companies, which gives them unrivalled advantages in their sectors and also offers a 'step up' for any aspiring company or individual wanting to innovate in their field.

2. 'Crowdsourcing': Phillips, Nintendo and iStockphoto.

'Crowdsourcing' is yet another neologism for open source practices and mass collaboration. The term was coined by Jeff Howe in 2006 to define the process of offering a task, normally offered to an employee or a contractor, to the general public in order to harness outside talents. This process is by no means a new innovation in business models, with early examples of 'crowdsourcing' reaching as far back as the eighteenth century. However, the open source revolution combined with the networked age has facilitated this practice into a much more effective and recognised business model.

The Dutch multinational lifestyle technology company Phillips has implemented the 'crowdsourcing' technique to engage their consumers in their research and development processes. Their platform resides at livesimplicity.com and essentially comprises of a forum that facilitates discussion in the topics of Business, Communication, General, Internet & Technology, Lifestyle & Social and Wellness. Contributors to the discussions are presented with a description of a problem (set by Phillips) and then two contrasting viewpoints on the problem. The contributors can then either vote on the viewpoints or register and write comments. They are rewarded for their involvement in this process with a rating system which enables members to build respectability within the community with highly rated members selected to contribute to other discussions. Although on the surface this seems to be just another forum, the

descriptions posted by Phillips are often research and development problems with their innovative products. This not only harnesses external creative minds in the development of Phillips' products but also involves the prospective end users in their development process.

The entertainment sector giant Nintendo is another example of an organisation that is successfully utilising 'crowdsourcing' in their business model, unlike the previous example however, it is not part of their research and development programme but generates extra revenue off the back of user generated content. Nintendo recently released (in Japan, at the time of writing, with the U.S. and U.K. versions still in development) their 'WiiWare' programme for the popular Wii platform. This is a 'channel', developed as part of the 'Wii Shop Channel', where developers with small budgets can 'release innovative, original, and smaller-scale games without the investment and risk of creating a title to be sold at retail' (Wikipedia). These 'user generated' games are then sold through the 'WiiWare' channel using Wii points, the same currency used to purchase the already available 'virtual console games', and are downloadable using the Wii's internet connection. This scheme has the potential to generate developer and user communities that have vested interests in developing games for the Wii and its innovative interaction capabilities. This will give Nintendo a large network of small development companies and individuals willing to develop and innovate ultimately to Nintendo's financial benefit and will add value for its customers and consumers of their products.

iStockphoto is an international royalty free stock photography library trading solely over the internet. They adopt the micropayment business model using differing numbers of credits depending on the size and quality of the image. They have also recently started trading in stock video and vector artwork. The interesting aspect of iStockphoto is the fact that unlike most stock photography repositories, its entire collection of stock images, video and illustrations is user generated and anyone can become a contributor. Following a short sign up process (including information about requirements, policies, legal issues and basic photographic knowledge) any photographer of any age can publish their work through the website and receive a commission of 20% to 40% of the sale price of the image. With the most downloaded

image reaching over ten thousand downloads (at the time of writing) this business model has proved to be extremely lucrative for both iStockphoto and its contributors. As of April 2008, it consisted of nearly three million images from over fifty thousand contributors and a community consisting of over three million registered members. In 2007 alone, iStockphoto is reported to have made revenue of \$71.9 million USD of which its contributors earned over \$20.9 million USD (Wikipedia: iStockphoto)¹³. These figures alone give testament to the potential of user generated content and the 'crowdsourcing' business model. The iStockphoto community plays an integral part in the development of the company. Members communicate over a forum in which employees and developers of the service interact with their members discussing developments and new ideas to be implemented into the site as well as rewarding contributors with milestone recognitions for the numbers of downloads they have achieved, this lets members gain respect and admiration within the community.

Both iStockphoto and Nintendo use similar business strategies to the plethora of social networking websites such as Facebook, MySpace and YouTube as well as Wikipedia and other wikis. The common aspect of all such businesses is their ability to build a community, which is also key to any 'crowdsourcing' strategy. The power of a community of networked individuals that all have a vested interest in the subject matter is unrivalled by any other business strategy. Their attention to and their interest in the project in hand will be unconditional as they are participating due to the self-interested reason mentioned in the previous chapter. This can invariably lead to a higher quality and a more valuable end product to the consumer. These examples highlight ways in which companies can utilise 'crowdsourcing' as a method of embracing the open source ideology. The latter two examples are different from the Procter and Gamble example in that the 'crowd' produces the content in which the business is based upon. This is the basis for many of the open source projects that exist today and is an effective method of establishing large communities of people devoted to your cause.

¹³ Article on iStockphoto. (<http://en.wikipedia.org/wiki/IStockphoto>)

3. Open Innovation Middle Men: Innocentive and Ninesigma.

Another way in which open source can be used as a business strategy is to become a provider of different open source strategies and solutions. This does not imply providing free software solutions to businesses but to provide an open innovation service for companies to utilise in their research and development schemes. Not dissimilar from 'Connect + Develop', these organisations provide an independent service so that organisations that are looking to embrace open source can do so without setting up their own innovation platform.

Innocentive and Ninesigma are two organisations that perform similar services¹⁴. They both offer a service in which their clients (including Eli Lilly and even Procter & Gamble¹⁵) or 'seekers', as they are referred to within their system, can actively publish problems in the fields of physical sciences, engineering and design, chemistry, mathematics and computer science, life sciences and business to a networked community of 'solvers' who are dedicated to their field of interest. These problems or 'challenge problems' are opened up for innovation and development by the open community. The identities of both the 'seekers' and the 'solvers' are kept private and the IP (intellectual property) transfer process is managed entirely by the organisation (Innocentive or Ninesigma). Cash incentives are offered to the solvers who substantially innovate in their field and meet the 'seeker's' specification. This process could in theory entirely replace the need for a company to have a research and development department but in practice it only reduces the expenditure and supplements existing R&D programmes. Innocentive not only provides this service to profitable organisations but also offers an open innovation service to non profit organisations and charities. Organisations such as The Rockefeller Foundation¹⁶ offer up challenge problems in solving famine, diseases and

¹⁴ Innocentive - <http://www.innocentive.com>

Ninesigma - <http://www.ninesigma.com>

¹⁵ Eli Lilly is one of the world's largest corporations specialising in pharmaceuticals with some of their more notable innovations including insulin and Prozac (anti depressants). (Wikipedia: Eli Lilly)(http://en.wikipedia.org/wiki/Eli_Lilly_and_Company)

¹⁶ The Rockefeller Foundation is a philanthropic organisation that solves problems such as diseases and poverty through the use of scientific innovations. (Wikipedia: The Rockefeller Foundation)(http://en.wikipedia.org/wiki/The_Rockefeller_Foundation)

poverty situations in some of the world's most poverty stricken countries in which the same community of 'solvers' can choose to innovate in areas that will help others around the world.

These open source 'middle men' provide an extremely valuable service in the advancement of the networked economy and help companies more attuned to the traditional operations of the established economy adjust to the certainty of the emerging economic model. Without major investment of resources, companies can use these services to 'test the waters' and establish the confidence in open source methods as a business strategy. Furthermore, they can either continue using these services as part of their strategy or develop a programme of their own (akin to Connect + Develop).

The examples shown in this chapter were simply 'cherry picked' from the vast numbers of success stories in the field of open source business and open innovation. They all show varying aspects and methods of utilising open source strategies and embracing the networked economy and serve purpose in instilling confidence into other organisations that are apprehensive at the change. In the same way that free software programmers leave source code 'open' for others to view, use and modify, P&G have opened up their innovation information or their 'research and development source code' as part of 'Connect + Develop' in order to set up an exchange system with other company's or an individual's innovation source code. This facilitates development of not only P&G's products but encourages smaller companies and individuals to advance in the market place. The crowdsourcing and middle men examples are less literal with their definitions of open source business. Their strategies have come from the open source ideology of collaborative efforts towards an improved end result rather than opening specific data to the public which, nevertheless, yields similarly effective results.

Conclusion

The title of this thesis hypothesises whether open source can save the world. This in a literal sense would not be a practical reality however using open source to save the world's economy from the inadvertent threat that open source posed originally seems to be a practical solution and sensible step in the right direction for the traditional economy.

Technology has advanced exponentially during the last century however the economic principles behind the traditional economy still largely remain the same as when Coase defined them. The world has changed and so too does the economy in order for it to stay ahead of the individual. Economic leaders such as Procter and Gamble have already realised this fact and are pioneering the new networked paradigm. Their open boundaries attract some of the most talented minds in their fields and they quickly become a center for innovation and successful business strategies. Instead of creating products within their organisation, their internal workforce can concentrate on creating value from their new worldwide R&D department (Tapscott, 2007: 290). Their end products become increasingly user centered and contain more and more value for their consumers giving them an unrivalled competitive edge in the global market place. However, in order for the economy as a whole to complete the shift into the networked age others must follow suit. The death of the gargantuan, traditional organisation is nigh and the only way to avoid this is to be 'open'. In whatever guise you choose to accept the open source ideology it will always be a step in the right direction. At the most basic level the work is done for you by dedicated individuals working on a non-monetary basis and you quickly develop a community that you can use at your disposal.

It is true that the move to an open source business strategy can be an uncomfortable move to make for many organisations accustomed to traditional economic ethos, however, this has become a necessity. This is the reason why organisations such as Innocentive are so valuable to this change. They provide a compromise and a low risk 'life line' for apprehensive companies

with the uncertain future that lies before them. This move can be made a lot easier by such organisations and by heeding the examples they set.

To summarise, the answer to the question 'Can open source save the world?' would be a positive one. It can not only save the global economy from the individual but can provide a business strategy that surpasses performance of any previous models. As Benkler points out in a lecture on Open Source Economics 'social production is a fact, not a fad...[it is] sustainable and growing fast' (2005). This is the new paradigm for the modern economy.

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