

Open Source Entertainment -

How media and entertainment might thrive in a networked economy

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Summary

Peer-to-peer technologies have made file-sharing a very popular activity, but while governments try to counter its impact, arguing it will decrease the amount of creative works produced this paper suggests the opposite. Peer-to-peer technologies effectively lower the barriers of creative production and distribution thus increasing the amount of creative innovations available.

However as this technology also makes many of the current business models obsolete, new models must be created. The paper proposes that those models can be found by studying the open source development process where value is created on the edge of the commons of intellectual production by centering on the total user experience.

over the Internet. The idea was not new though. Just a few years earlier Shawn Fanning, a student in Boston Massachusetts, had released a similar piece of software named Napster. However whereas Napster was built on the classic hierarchal client-server architecture, Gnutella turned every computer on which it was installed into both a server and a client. This way Gnutella eliminated the class system and made all computers and all computer users equal. An entire network of users could now be connected without ever requiring the assistance of the old Internet authorities as the central servers and the companies that controlled them.

Thus the idea of peer-to-peer computing demonstrated to the public what Internet was originally designed to be: an exchange of information among people on the same level (Lewis 2001). In fact, one of the primarily motivations for building ARPANET, the predecessor to Internet, in 1960s was the belief that by connecting different computing sites, communities of computer programmers could more efficiently share their programs and knowledge (David & Fano 1965, Abbate 1999, Naughton 2000).

As such, the original architects invented an engineering principle that would leverage this effort and it later came to have a direct effect on the innovative efforts by Justin Frankel. This principle, called the end-to end argument (e2e), says to keep the intelligence in the network at the ends, or more precise in the applications, leaving the network itself to be relatively simple (Saltzer et al. 1984, Isenberg 1997, Lessig 2001). Moreover, because the architects of the internet decided not to try to anticipate how their network might be used, they designed protocols leaving the Internet to be relatively neutral or stupid (Isenberg 1997).

The idea behind this principle was to increase the flexibility of the network. A special feature of the network shouldn't restrict future innovations or

The Birth of Peer to Peer Computing

The 14:th of March 2000 marks the beginning of the end to an era that stretches over 500 years through history. On this date a twenty-year-old employee of America Online named Justin Frankel posted on the



Internet a piece of open source software called Gnutella. The name was a combination of the chocolate spread Nutella and GNU, the free operating system that was later publicity recognized as GNU/Linux or just Linux (Lewis 2001).

Gnutella enabled people to share files, computing power and everything else that resided inside PC:s

applications nor should it constrain what was possible. Accordingly, the network itself would not control how it would grow - applications would. In effect, the Internet does not know what it is carrying since the intelligence and the majority of the processing power in the network is pushed out to the edges (Saltzer et al. 1984).

This simple principle sets the Internet apart from every other communications network. For example, it is different from the switched telephone network that is made up of relatively stupid edges, your phone, and a smart network, complicated switches at the center (Weber 2004). The same thing applies to television and radio broadcasting. Indeed, the overall broadcasting paradigm embraces the opposite of end-to-end principles (Lessig 2001). The ends in the broadcast medium i.e. the receivers are stupid, not smart. Instead all the intelligence is in the broadcaster itself. It is a system of control where the network owner decides what the network should carry.

Internet on the other hand does not enable control. Here barriers to entry are low and nondiscriminatory. The conduit becomes just a pipe that carries what people on the edges ask it to carry. Hence, the stupid network empowers innovators to try out their innovations without having to ask permission or procure a license from the network owner. Indeed, the design choice of end-to-end assures that those with a new idea get to sell that new idea, the views of the network owner notwithstanding. This very design has had a critical effect on innovation. It has even been, in the words of the NRC, a "key to the explosion of new services and software applications on the net" (NRC 2000). So to those who argue that control is necessary if innovation is to occur, and more control will yield more innovation, the Internet is the simplest and most direct reply (Lessig 2001).

The Impact of Open Innovation

So on March 14th when Justin Frankel releases Gnutella he not only utilizes the potential of Internet neutral design he also demonstrates how this technology differs from all the previous communication networks, which logic can be traced as far back as the printing press (Friedman 2005). With Gnutella it came obvious how the Internet's neutral design would allow creativity and innovation to reside on the edges of the network outside of a big company and corporate control how ill tuned the contemporary business models was to digital technology. In the years to follow, people would follow in Justin's footsteps improving his initial innovation and releasing their own filesharing clones such as Kazaa, Grokster, Direct Connect, Morpheus, BearShare, iMesh, Limewire, Aimster, BitTorrent etc.

As such the foundations on which the media- and entertainment industry had built their businesses started to crumble. The broadcasting paradigm, where information is produced by a few professionals

and distributed to the consuming public for a fee, began to look painstakingly obsolete as people embraced the potential of peer to peer computing and filesharing. Today over 1 million Swedes have used the filesharing networks to download copyrighted material from the Internet without permission (SCB 2005) and Big Champagne estimates the filesharing networks to be used by 10 million simultaneous users worldwide (Anderson 2006).

The resulting effect on record sales has been discussed with great controversy (Oberholzer & Strumpf 2004, Lebowitz 2004, Blomqvist & Eriksson et al. 2005) but whatever the reasons behind the decline of music sales, the facts are depressing. For the first time in a decade album sales has fallen. By the end of 2005 music sales in the United States had dwindled more than quarter from their peak in 2001 and the number of hit albums fell by nearly a half (Andersson 2006). The market in Sweden is even worse. Here the sales have fallen by almost 50% since their peak in 2001.



The response by the entertainment industry has been to fight this new technology by taking consumers to court suing them for copyright infringement. Since 2003 the Recording Industry Association of America has filed some 14,800 lawsuits against individuals it says are stealing material (Lenhart & Madden 2005). The impact of this effort has however been somewhat disappointing as the popularity of filesharing is still growing. Last year the filesharing population in the US grew by more than 20% (Lenhart & Madden 2005) and the traffic Pirate Bay reached an all time high of 3.7 million visits a day during June 2006 after an unsuccessful attempt of the Swedish authorities to shut down the site (Rydergren & Willerbrand 2006).

It is quite plausible that filesharing will never go away. Faced with the declining price of broadband and disc space and the increasing amount of content available from the filesharing networks, most people will probably continue to download most of their content from the illegal options available to them online. Hence what are needed are new business models with the capacity to utilize the benefits provided to consumers by digital networking technology. Interestingly that answer might be buried within the name itself of the innovation that started this revolution.

Remember that Justin Frankel named Gnutella partly from the open source software now publicly recognized as Linux. This operating system is at present not a marginal phenomenon. Gartner/Dataquest estimates that Linux has 18 million users worldwide, making it the single largest collaborative project in the planet's history (Rivlin 2003). The operating software is robust enough to run the world's most powerful supercomputers yet sleek and versatile enough to run inside consumer toys. Increasingly, open source software is running major enterprise applications for large and small corporations alike.

Amazon, E*trade, Home Depot, Toyota, Fidelity, Royal Dutch/Shell, Reuters, and Merrill Lynch are examples of companies that have switched backend computer systems to Linux. Overall nearly 40 percent of large American companies use Linux in some form (Weber 2004). However, open source software is not only limited to Linux. A number of open source projects such as the Apache web server and Sendmail, dominate their respective product categories (Frauenheim 2002). In total, there exist thousands of open source projects, ranging from small utilities and device drivers to office suites, database systems, operating systems and special software including Gnutella. In total Sourceforge.net has reported 67,000 discrete projects overall (Goetz 2003, Weber 2004).

Yet, the recent adoption of all these open source projects is completely overshadowed by the Internet - itself the largest single structure humans have ever built (Thimbleby 1998). The single most mission-critical Internet application, the Berkeley Internet Name Daemon (BIND) system, which connects names to IP-addresses, was developed as an open code project at the University of California at Berkeley. Together with the public domain protocols that define the Internet, referred collectively as TCP/IP, including the core protocols for the World Wide Web, this free code made the Internet possible. Hence, without the open source mentality the Internet and the World Wide Web could not have been built (Berners-Lee 1999, DiBona & S Ockman et al. 1999, Raymond 1999, Lessig 2001).

Open Source Business Models

When we say "open source" we are speaking of the right to copy, distribute, modify, and redistribute software code. Consequently, when software is "free" or "open source", users are allowed to download the software from the Internet and use it without charge. Users are also explicitly granted the legal right to study the software's source code, to modify the software, and to distribute modified or unmodified versions to others (Franke & von Hippel 2002). Hence, by having the source code to a program you are given the power to change, fix, customize and learn about a program. This is a power you do not have if you are not given the source code.

This way open source processes encourages not only peer-to-peer distribution but also peer-to-peer production and innovation in the sense that everybody belonging to the community can share their knowledge with others. However open source processes also undercuts the conventional business logic in the sense that property in open source is configured fundamentally around the right to distribute, not the right to exclude (Raymond 1999, Stallman 2002). One of the most obvious points is that suppliers cannot generate significant

income from selling undifferentiated copies of a digital product because freedom of redistribution would move the market price toward the marginal cost of reproduction, which is asymptotically zero (Weber 2004).

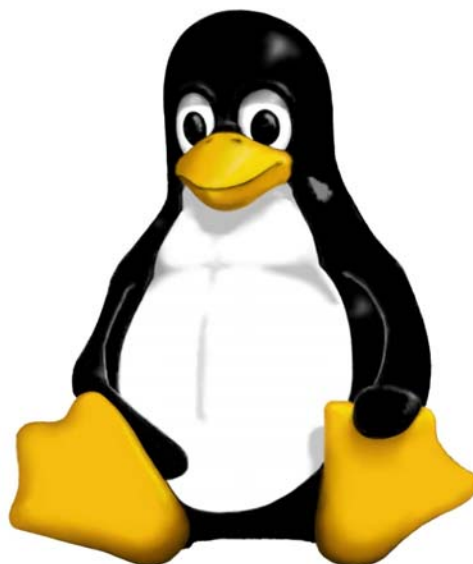
Even so, faced with this dilemma a growing number of business models, configured around open source, have in recent years become very successful, thus indicating that a good business model in a networked economy simply is the one that succeeds in creating additional value on the edge of the commons of intellectual production. For example companies like Red Hat, SuSe, Debian, Caldera, VA Linux, TurboLinux, Conectiva and Covalent make their money essentially by tailoring open source software to the specific needs of their customers. The customers don't have to pay for the software itself but pay for the knowledge, services and added features provided by these companies (Bonaccorsi & Rossi 2003).

Hence, what the customers are really paying for is the reliability and convenience that comes from dealing with a trusted partner (Weber 2004). Moreover, Red Hat has almost become a de facto technology standard, but not because it can exclude other companies or individuals from appropriating its technology. Rather the opposite. Red hat has almost become a standard by the virtue of abandoning the classical value chain and replacing it with a network configured around a positive feedback loop including both its customers and the open source community.

In fact, the funds Red Hat earns, they invest in new open source software development, which it gives back to the community under the General Public License (GPL), often referred to as copyleft. This is part of its explicit strategy to maintain a synergistic relationship with the user community. But Red Hat's promise to release all its software under the GPL is not only aimed at keeping the developer community on board. When Red Hat releases its software, the viral clause of GPL creates a situation in which anyone else trying to build something on top of the Red Hat software must also release its software under GPL.

This means that any valuable innovation by another programmer or company can almost immediately be reincorporated into Red Hat Software, removing the competitive advantage of a new entrant (Weber 2004). Someone else might innovate, but since Red Hat dominates the conventional marketing and distribution channels it is Red Hat that reaps most of the economic benefits.

In principle, no one can produce anything new from Red Hat software that Red Hat can't absorb and then market more effectively. Hence, copyleft, the opposite of copyright, paradoxically protects Red Hats competitive advantage.



Moreover, even if the underlying software is free there is nothing saying that you can't sell any complementary products. IBM for example has both adopted the Apache server and Linux since it makes money by selling equipment. IBM has even committed its own money and resources to support the development of Linux and Apache. In 2001 IBM took the step of placing \$40 million of in-house tools for developing software into to public domain because it sells more equipment if the software that runs that equipment is better (Lessig 2001, Thomke & von Hippel 2002). Therefore, the free software it supports simply adds to the value of the equipment it sells (von Hippel & von Krogh 2003).

These examples would suggest that a vital business model can be realized even though the underlying product is not protected with traditional copyright or patent law. However a critical question remains. Does this business model scale to other industries?

Open Source in Other Industries

The interesting thing about the intellectual commons form of open sourcing is how quickly peer-to-peer production and distribution has morphed into other spheres and spawned other self organizing collaborative communities, which are democratizing production and distribution in their own areas. For example consider the blogosphere where cheap computer software and the Internet have given millions of people the means of production to become their own publishers. Technorati, the leading search engine for blogs, estimates that over 50 million people are currently posting their texts, pictures, video and linking to other sites via their online diaries.



WIKIPEDIA
The Free Encyclopedia

the online dictionary Wikipedia, which on July 1, 2006 offered more than 4.6 million articles in 200 languages written by more than 48,000 voluntary contributors. As contrast, consider that Encyclopedia Britannica and Microsoft's Encarta offers less than 80,000 and 4,500 articles respectively (Anderson



2006). The list goes on from scientific projects as the Human Genome Project, SETI@home (Search for Extra Terrestrial Intelligence at home), Mars Global Surveyor Map by Nasa, PLOS (Public Library of Science), Groklaw etc. to more commercial projects such as the social networking site of MySpace, the photo sharing service Flickr, the hugely popular online computer game World of Warcraft and the virtual world of Second Life, where the users produce all the content.

Hence peer-to-peer production and distribution is not an uncommon phenomenon. On the contrary, the Pew Internet and American Life project report that some 57% of online teens and 35% of all Internet users create content for the Internet. That amounts to about 48 million individuals in the US alone (Horrigan 2006). These content creators creates blogs, work on a personal home page, share original artwork such as photos, stories or videos online and remix content found online into a new creation.

What is especially interesting is that there is a significant statistical association between having a home broadband connection and putting content online, suggesting that this activity will continue to grow in the future as the broadband penetration increases (Horrigan 2006). Also the balanced growth in broadband penetration and user created content among broadband users is further evidence that posting content on the Internet is not just a phenomenon limited to early internet adopters (Horrigan 2006).

Sweden is by no means different. Even though the SCB, a Swedish research institute, does not publish the data on an aggregate level the category breakdowns tells us that the Swedish and the American Internet user are very much the same. In the age group between 16-24 years 43% report posting content in chat-rooms and newsgroups, 22% report have written a computer program, and 25% report have built a website. In that same age group 38% report have been using peer-to-peer filesharing services (SCB 2005). This suggests that among the Internet population peer-to-peer distribution is as common as peer-to-peer production thus indicating that the open source model of production might have a more general application beside the server software industry.

Creating Value on the Edge of Intellectual Production

The problem with the business models currently used within by the entertainment industry is that they don't tap into the full potential of the digital copy and networking technology. While they utilize some of the benefits such as low cost of production, reproduction and distribution they do not support the consumer from benefiting of the same technology thus limiting not only the marketing potential of the original work but also the potential amount of new innovative works created.

In fact, one of the main benefits with digital technology compared to the analog equivalent is that the former is easier to copy and modify (Stallman 2002). Or put more simply: Digital technology brings the ability to improve the creative works by others thereby growing the stock of qualitative innovations.

As digital technology continues to reduce the cost of production, more content will be produced thus growing the demand for convenient information filters such as brands and search engines. This need is already increasing. Between 2004 and 2005 the number of new albums published in the US grew by 36%, from 44,000 titles to 60,000 largely due to the ease with which artists can now record and release their own music. At the same time bands uploaded more than 300,000 free tracks to MySpace, accelerating the need for filters even further (Anderson 2006).

Nobel price winner Herbert Simon has once said: "A wealth of information creates a poverty of attention" (Shapiro & Varian 1999:6). When the amount of information goes up so do the search costs and those aggregators who can help people navigate through a world of abundance are in a better position than those who make a living from scarcity. For example, it's no coincidence that Google, the worlds largest search engine, has revenues of more than \$ 5 billion a year and that amount is doubling every nine months (Anderson 2006).

The really interesting thing however, is how that money is made. Google like Red Hat has built its revenues not by being at the center, but on the edge of intellectual production. Almost nothing that Google displays is produced by itself. All it does is list what sites are probably most relevant to you as a searcher. And if you as an advertiser want instant publicity there is no other way but to bid yourself to the top of the list. The great paradox with networks is that value doesn't seem to come from the content you produce but from the content you can link to. Hence in a world of infinite choice, connectivity - not content is king.

And what holds for Google might also hold for the entertainment industry. For example the site Pirate Bay which publishes links to various filesharing torrents is reported selling advertising space for over sek 50,000 a month (Rydergren & Willebrand 2006). And with newspaper readership and TV ratings on the decline, especially in the US, Internet as a platform for advertising is starting to look ever more attractive. In Sweden alone online advertising, mostly thanks to Google, is growing with 44% and is currently at par with the spending in magazines reaching well above

sek 2,4 billion annually, giving it a share of total advertising spending of 8,3% (Irm 2006).

The situation in the US is not any different. Here online ad revenue has swollen to a market worth \$ 17 billion (Jönsson 2006) indicating that the entertainment industry would probable have much to gain by following the business model presented by Google, Pirate Bay, YouTube and MySpace.



In fact, Rupert Murdoch, founder and chairman of News Corp is betting \$ 580 million on this business model. Last year the company engaged in a bidding war with Viacom for buying the social networking site

of MySpace from InterMix. A war News Corp finally won. Since then membership has quadrupled to over 100 million users and the growth continues adding 280 000 new members each day making the site traffic ratings second only to Yahoo (Reiss 2006). On an average day 45-50 million people visit the site (Jönsson 2006).

When Ross Levinsohn, chief executive for News Corp online ventures, comments on how MySpace will pay for the investment by News Corp he says: You'll see us morphing from a content company into a marketing company" (Reiss 2006: 164). When people produce all their content themselves, News Corp will be the switchboard sitting on the edge of intellectual production connecting the blurring distinction between artist and users in a positive feedback loop while collecting revenues from selling advertising space to those people who want to catch the public eye. Indeed, on the 12 of August 2006 Google paid an astonishing \$ 900 million for publishing it search field on MySpace giving the original investment by News Corp a positive return in less than two years (Jönsson 2006).

A New Experience Economy

In the near future there might not be a working band or a musician left in the English speaking world that doesn't have a MySpace profile. Ditto comedians, artists, photographers, filmmakers and practically anyone else trying to make a living from intellectual production. However, faced with the growing popularity of filesharing they too must find alternative revenue models. Increasingly that additional value might also be found on the edge of the commons of intellectual production.



With the contracts currently in use, a musician collects about 4-9% of the album sales after expenses paid by the record label for studio time and marketing (Grimm & Petersell 2000, Scott 2001, Engström & Hallencreutz 2003).

However approximately 80% of albums and 85% of all singles released fail to cover these costs leaving the artist without any compensation for the work produced (Caves 2000). Hence the vast majority of artists, including those lucky few with a record contract, never see any money from album sales.

On the other hand, the increased publicity the filesharing networks might bring may translate to real money from concert tickets and merchandise. Indeed, the average band collects about 85% from the ticket revenues at concerts and 100% of merchandise sales that take place at the live performance. Normally the merchandise revenue a band receives equals roughly 25% of ticket sales (Caves 2000).

So even if the artist is not compensated for his or her original work by the sales of albums, it will still be possible to collect some income from public performances. For example, the rock band Dir en Grey from Japan, ranked in more than \$80,000 in tickets and another \$65,000 in posters and other merchandise from the three concerts it held in the US despite the fact that the band have had no airplay, no presence in mainstream media and have never released an album in North America (Robert La Franco 2006).

This business model would by no means be a new one. In fact, the model has historically been adopted by many artists. The Grateful Dead are probably the most well known example of a band with a high tolerance of pirated music. In order to secure long term popularity and the sales of diverse products, the band encouraged the distribution of their music via copied tapes. Rather than focusing on the sale of CD:s the band created an environment that people enjoyed and wanted to be a part of (Pfahl 2001). With the Internet, live appearances will probably take on greater value for both the artist and their audiences. The more popular an artist becomes, the greater the demand for live performances, and with greater demand, more people will pay for them to perform, which in turn generates revenues for the artist (Pfahl 2001).

Indeed, as John Perry Barlow, songwriter of Grateful Dead has put it: "In regard to my own soft product, rock 'n' roll songs, there is no question that the band I write them for, the Grateful Dead, has increased its popularity enormously by giving them [the songs] away...The fact is, no one but the Grateful Dead can perform a Grateful Dead song, so if you want the full experience and not its thin projection, you have to buy a ticket from us. In other words, our intellectual

property protection derives from our being the only real time source of it." (Barlow 1994:8).

Barlow is not the only artist stressing the importance of live concerts. In 2002 David Bowie predicted that "music itself is going to become like running water or electricity", and he advised performers, "You'd better be prepared for doing a lot of touring because that's really the only unique situation that's going to be left" (Pareles 2002:30). In fact, faced with the growing popularity of the filesharing networks many artists have gradually started to seek out additional revenue.

Between 1996 and 2003 the average concert ticket price increased with 82%. Since then, revenues have treaded upwards suggesting the price elasticity of demand to be less than 1 (Krueger 2005). However at the same time artists have also cut back on the number of shows performed in the US with 16%, ignoring the recommendation by Bowie and causing the tickets sold at concerts to drop from 30 million to 22 million (Krueger 2005).



John Perry Barlow - Songwriter of Grateful Dead

The accumulated effect has been a 10% drop in total ticket revenue for the artists, further emphasizing the growing importance of live performances. The rock band Clap Your Hands Say, is one of the few exceptions. Without a record label the band has sold over 100,000 copies of its self released CD, mostly thanks to its publicity on MySpace. The band has over 45,000 friends and is famous for its busy tour schedule, currently performing each night throughout the US (Steuer 2006).

Centering on the Total User Experience

Clearly by focusing on the total user experience it seems possible of collecting additional revenue on the edge of intellectual production. One specific company might have sized this opportunity better than anyone else. With more content than ever available online, filling the disc space of 10,000 songs in an MP3 player by using the filesharing networks seems like a lot of hassle in particular when you can't evaluate the quality of the songs before you have listened to them.

Previously this was mainly done by listening to radio or watching MTV. Recently however, due to the consolidation of radio and centralized programming by Clear Channel in the US, diversity has taken a back seat while MTV doesn't show many music videos anymore (Krueger 2005, Anderson 2006). This fact encouraged Steve Jobs to launch Apples online music service today carrying over 700,000 songs.

Instead of downloading 1000 songs from the filesharing networks in order to find the few ones you really like, iTunes made browsing and downloading easy. To be sure, the simplicity and the convenience of the service have made people consider iTunes as a competitive alternative to many of the filesharing networks. In May 2006 iTunes alone was even at par with the filesharing networks combined, attracting more than 10 million people worldwide (Lenhart & Madden 2005, Honan 2006). Moreover, Apple report selling over 1 billion tracks since its launch in 2002 giving it a US market share of 70% for legal music downloads (Chan Kim & Mauborgne 2005, Anderson 2006).

Also the sales of downloads in Sweden are up, growing with more than 420% since last year (GLF 2006). In fact, between January and June the sales digital downloads even outnumbered the sales of CD albums selling 10,190 and 6,667 units respectively. This has happened despite the fact that the songs on iTunes costs 99 cents each, while they are essentially free on the filesharing networks.

What would happen if the songs would be priced less? Although iTunes might be convenient, not many people can afford paying \$ 9,900 for 10,000 songs. In fact, at the present state less than 1% of the capacity of all Ipods is estimated to be filled by songs from iTunes (Honan 2006). The reason digital downloads are being priced so high, it that the four global music conglomerates, being afraid of channel conflicts with the retailers, insist on getting almost the same cut they get from selling CD:s. And with the current contrasts written with Apple, they receive a mere 65% of the purchase price so a lower price might seem impossible?

On the other hand, consider that by a pure digital model each copy manufactured and sold is simply a database entry incurring a marginal cost of essentially nothing (Anderson 2006). May and Singer (2001) for example propose that of the \$15 that consumers typically spend on a CD, around \$9 has the potential to be "redistributed" if electronic distribution channels are used.

Moreover, based on the cost estimates provided by Engström & Hallencreutz (2003), without the need to pay for studio time, reproduction, distribution and marketing, the total costs might be lowered with up to 95%, further increasing the demand of legal downloads.



Indeed to see the consequences of lowered prices we only have to look at the book publishing industry in Sweden. Due to the tax relaxation, the introduction of pocket books, a deregulated market where retailers are free to set their own prices and a wider distribution, primarily through supermarkets and convenient stores, the industry has seen a twelve fold increase in sales since the early 70:s, from sek 145 million in 1974 to sek 1,752 million in 2005.

The main cause behind this phenomenal growth has been the tax relaxation in 2002 which caused the prices to plummet to more attractive levels increasing the demand with 14% in just one year. Nevertheless the distribution of pocket books sold outside the traditional retail channel has been a contributing factor. In 2005 sales outside the traditional bookstores accounted for almost 60% of all sales. In total, a wider distribution and lowered prices have made the Swedes a population of reading fanatics, each on average buying 10 books annually (SvFs 2006).

However what might be the biggest gotcha for Apple is that the company is not dependent on the revenue that comes from selling songs or video. Indeed, by following the approach of IBM, where money is made by selling hardware on the edge of the commons of intellectual production, Apple has put itself in a very comfortable position.

As market pressures eventually will force the price down to the marginal distribution cost of reproduction, Apple will still make money from the excellent hardware it sells. In fact during the third quarter of 2006 Apple shipped 1,327,000 Macintosh computers and 8,111,000 Ipods together representing revenue of \$ 4.37 billion and a net quarterly profit of \$472 million (Apple 2006). Interestingly those shipped Macintosh computers also indicates that making money from uploads - not downloads, is where the future of the entertainment industry might be heading.



By using the hardware and software provided by Apple anyone can become a full-fledged artist. For example included in the software suite I-life you find a complete set of tools for intellectual production, effectively lowering the barriers of making films, newspapers, web pages and music. And if you are really serious about your artistic efforts in music for example, there is the professional music suite called Logic Express that ships for \$400.

A closer look at Apple also reveals that the company is actually an open source multimillion dollar powerhouse. In fact, according to Apple, the company has made Open Source development a key part of its ongoing software strategy. Major components of Mac OS X, including the UNIX-based core, are made available under Apple's Open Source License allowing developers and students to view source code, learn from it and submit suggestions and modifications. In return Apple distributes the software created by the Open Source community and its enhancements back to the community.

Currently the company supports over 180 different open source projects including Apache, Open Directory, FreeBSD, Bind, emacs, fetchmail, MySQL and GNU. You can even set up your peer-to-peer super-computing grid, just like SETI@home, by using Apple's X-grid, or take an active part in the peer-to-peer online dictionary of Wikipedia from our desktop.

What this effectively means is that Apple through its brand, hardware, software and multiple distribution channels has created a switchboard connecting the blurring distinction between professional artists, programmers and amateurs in a positive feedback loop thereby leveraging the potential of peer-to-peer production just like Red Hat and IBM.



Conclusions

Apple is by no means the only company making peer-to-peer production a key part of its ongoing strategy. In fact the business model is finding supporters in a growing number of industries. For example, many videogame developers such as Dice, Valve, Blizzard Entertainment, ID software and Bethesda softworks are currently experimenting with this business model and what seems to be the common denominator is the recognition of the following six conclusions.

Production is consumption: People produce content that they are willing to share with others not because they expect to make money from their efforts but by the sheer joy of being able to produce something new and creative.

Value is based on uploads not downloads: Since production has become consumption there is a growing market potential in offering the means of production, thereby lowering the barriers of creation.

Revenue is created not at the center but on the edge of production: With lower barriers for creative production, those who can leverage the growing supply of creative works are in a better position than those who make a living from scarcity.

Connectivity not content is king: In a market of abundance and infinite choice, firms acting as a switchboard connecting the blurring distinction be-

tween professional artists and amateurs in a positive feedback loop will be in a better position than those focusing on the traditional value chain.

Copyleft is more relevant than copyright: Firms acting as a switchboard instead as a value chain has more to gain from copyleft than from copyright since any additional modifications or enhancements by the user community can be incorporated in new releases.

Open Source Development is a general production process: Open source processes are not restricted to server software and by studying the dynamics of this production process firms have the potential of unlocking the value of peer-to-peer production and distribution.

Can open source development even be the next generation of production and innovation? Perhaps. At least there are many arguments supporting it might

have a more general application in society. However as we can see from the conclusions presented above, the foundation of its logic is more or less a complete opposite of the common practices currently used by many organizations in the entertainment industry.

Accordingly there are still many questions that must be answered in order to evaluate the relevance of the open source development model outside of server software production. Nevertheless, in the end it is my hope that this paper will give us all a better understanding of how we might benefit from peer to-peer distribution and production instead of countering its potential by dragging private persons to court suing them for copyright infringement.

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