Free Beer

Written by speakers at FSCONS 2008

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A complete list of reference links can be found on freebeer.fscons.org.

FSCONS, the Free Society Conference and Nordic Summit, is a annual event taking place in Göteborg, Sweden. Please visit fscons.org for more information.

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Nikolaj Hald Nielsen

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From Consumer to Creator

The Lego Generation in the Digital Age

1.1 Intro

I spent much of my childhood playing with Lego. My parents were never at a loss for what to get me for my birthday. While soft packages were scorned, the hard, box-shaped packages with that very special sound when you shake them were always a hit. I quickly outgrew building fixed models based on other people's ideas and started exploring the boundaries of what could be achieved with my imagination and my, unfortunately not as large as I would have wanted, collection of bricks. I would spend long afternoons building a spaceship that could transform itself into a moon base once it had landed, castles filled with secret rooms and traps, or weird machines that did a whole lot of nothing, but looked very cool doing it. Once built, I quickly lost interest though. For me, the fun part was not so much in playing with the things I built, as the creative process of actually building them. I know I was far from the only one.

Today I have replaced the Lego bricks with something else. Instead of small pieces of plastic, I am piecing together virtual building blocks of code on a computer screen. The basic desire to create, to use my mind and my hands to build

something that no one else has done before is the same, however, the satisfaction when my ideas slowly become real no less exhilarating. There are important differences though. Whereas in my childhood, building my Lego contraptions was mostly a solitary activity, today I am working with like-minded creators, accomplishing together what we could never hope to achieve on our own. And we are doing this in a spirit of openness and freedom, sharing the results of our labour, our software, freely with each other and the rest of the world.

Thanks to the ideas that were first formalized with Stallman's definition of Free Software[1], which have long since spread into other areas, such as Free Culture, we now have a conceptual and legal framework in place to foster this kind of collaboration and creative process, and the results are starting to show in a very big way.

For people who, like me, have grown up spending a great deal of time dreaming up crazy new ideas and trying to make them real with their hands and a finite number of bricks, the role as a consumer is not a natural fit. The notion of always receiving the creative works of others, only being allowed to play with the toys that others have built, feels strange. Yet this is how, for a large part, modern society works. A relatively small number of creators of software and culture try to convince us that their latest offering is what will make us happy, at least until the next big thing comes along. To make matters worse, the companies whose business is dependent on people constantly "consuming" their virtual goods have seen it in their best interest to start locking down their content by ever more sophisticated technical and legal means designed to make tinkering impossible. This is the digital equivalent of buying a Lego set that is not only pre-built, but where the pieces have been glued together.

The reasons why companies claim a need to lock down their contents are many, piracy being not the least. This discussion, and whether the countermeasures actually make economic sense, is a very large discussion all by itself that is better left for others with more knowledge of the area. One big issue I do see is that the companies value a creative work differently from society as a whole. For a record company or book publisher, value is proportionally related to the ability to monetize a given work. For society at large, the value of a creative work is something else completely, and something that is much harder to quantify. How do you determine the cultural value of a creative work? It would seem logical that cultural value is related to how many people come into contact with the work and how many new ideas it contains. But perhaps more importantly, a great indicator of a work's

[1] See http://ur1.ca/f6q5

cultural value is how much it is referenced, quoted and perhaps even remixed[2] (to borrow a term from Lessig) into derivative works, thus becoming a part of Culture in general. Based on this, it is my strong belief that the more controlled a creative work is, the less its cultural value will be as it becomes harder (or the barrier of entry becomes greater) to remix the work and integrate it with other works and other ideas in our shared cultural heritage.

1.2 Making the bricks play sound

My current involvement in Free Software is centred around the popular *nix (and slowly moving on to other platforms as well) audio player and manager, Amarok 2[3]. This is something I am quite passionate about as it is not only an outlet for my own creativity and that of the other authors and contributors, but it also strives to be a hub that can help bring other forms of freely licensed creative content to a greater audience.

Much of my understanding of, and appreciation for, the areas of Free Software, Free Culture and indeed the greater issues of Free Society comes from my work on this project, so it is only natural for me to explore these issues through this lens.

One of the basic premises behind Amarok 2 is that there is really no lack of high quality free content out there on the web (or in "The Cloud" as the fashionable term seems to be these days). The main challenge is making people aware of its existence. Whether you are an "up an coming" band, radio station, record label or indeed producer of nearly any kind of cultural content not inside the "mainstream media", one of your worst enemies is obscurity. With the vastness of the Internet, how do you get people to pay attention to you? You have to make yourself discoverable.

Amarok tries to accomplish this by making it easy to tie content from nearly any source into the core desktop application experience. Many of these sources will have content licensed under Creative Commons or similar licences, but this is not a strict requirement for inclusion of a service into Amarok. By making content available in a consistent way, and possibly tying content from multiple different sources together, the entire experience of discovering new content is greatly simplified. With the enormous potential audience, even the more obscure or experimental content, as long as the quality is high, is likely to find a significant audience.

[2] See http://ur1.ca/fcu2
[3] See http://ur1.ca/fcu4

An example of a source that is now integrated, and the one that actually got this idea started, is Magnatune.com[4]. Magnatune.com is a record label that tries to do "fair trade" music, treating both artist and customers with respect. One of the things this means is that customers should be able to listen, in full, to any album before deciding whether to purchase it or not. Magnatune.com not only provides these preview streams for all their content, but also a structured way of getting access to it from third-party applications. So within Amarok, it is possible not only to browse and listen to each and every album from Magnatune.com freely, as much as you like, but also make purchases directly from within the application. Many other Free Software applications have now included the Magnatune.com content as well, making it a classic case of "if you free it, they will come".

Amarok 2 includes many other sources of content already, such as Jamendo.com[5], LibriVox.org[6] and others. So as soon as a new user launches Amarok, these are immediately available. Perhaps much more powerful than this however, Amarok 2 provides the ability for people to add their own content in a relatively simple way.

One of the key issues to adoption of a scheme like the Amarok 2 service framework is the barrier to entry. In order to spur adoption, this should naturally be as low as possible. In an attempt to overcome this, Amarok 2 makes it possible for third parties to add services using simple scripts. This means that with very little knowledge of code, it is possible to add content to Amarok. Coupled with Amarok's integrated system for downloading new "service scripts", this is a potentially very powerful feature.

1.3 Celebrating Diversity

To be completely honest, the possibility of adding services to Amarok using scripts did not start out as a grand vision of empowerment. Few such things do. But as the work progressed and interested people started contributing scripts, even before Amarok 2 was ever officially released, it started to become clear that it had great potential.

A concept that has become quite clear to me lately is that though some content might be limited in its scope of appeal, due to language, topic, genre or a host of other reasons, this does not make it collectively less important. In fact, the sum of

[4] See http://ur1.ca/fcu5
[5] See http://ur1.ca/fcu6
[6] See http://ur1.ca/fcu7

people interested in content like this might well exceed the number of people interested in some of the services with more broad appeal that are already integrated. This is in essence the idea of the "long tail"[7].

There are however two main issues with "narrow" content of this kind. First of all, it is unlikely that any of the regular contributors to a project like Amarok will be motivated in adding sources of content far outside their own areas of interest. Secondly, including content that is too narrow in the default installation is not desired. 99% of the users are not likely to care much about Danish radio stations, and having too large a list of services installed by default is likely to cause confusion. Also, everything that is included in the default install will have to be maintained by the Amarok developers, taking time away from other development work. This is where the scripted services really show their worth.

Using the scripted service framework, people have already created a host of services for national radio stations, access to the BBC's and NPR's archives of freely available (but unfortunately not always freely licensed) materials, a service for a site running a monthly vote of the best Free music, and the aforementioned LibriVox service (which is included in the default distribution as an example of what is possible using scripts). All of these services can be browsed and installed from within Amarok and the content becomes instantly available.

Having localized or niche content easily available in an integrated form is interesting in a number of ways. Generally, in the Free Software and Free Culture movements, we have a tendency to be very Anglocentric. That is, most development work takes place in English, and this spills over into the kinds of content that we generally include in the standard distribution of an application like Amarok. For many people though, who speak poor or no English (or simply have no interest in English language content) this makes the application less appealing. The availability of third party scripted services providing easy access to local content, such as local or regional radio stations, can potentially do much to overcome this issue, making Amarok feel more "native" to non-English users. For instance, having the service providing a comprehensive list of Danish radio stations would be a great selling point for my parents, who, even though they speak perfectly fine English, generally only listen to Danish radio. And getting Amarok into the hands of more users expands the potential audience for the other integrated services, not the least of which is the Free Culture based ones. This example is based solely on my own

[7] See http://ur1.ca/fcub

work with Amarok and the integrated services, but the underlying mechanics apply far beyond this limited scope.

Which neatly brings me back to the Lego bricks.

1.4 Empowerment

One of the truly great things I see in the advent of Free Software and Free Culture is that it is getting a nearly unlimited amount of interesting bricks into the hands of creative people to build even more interesting stuff. This overcomes many of the financial and social barriers of entry that have traditionally made it difficult or impossible for “ordinary” people to create and disseminate high quality cultural works, software and so on, without the backing of a large corporate entity. The flow of culture, traditionally one way from the few to the many, is becoming much more many to many, peer to peer. While this new wave of peer-generated content might not supplant the traditional media industry any time soon, the amount and quality of Free Culture and Software available has long since reached the tipping point of becoming a viable alternative to many people in many cases. You can now run your computer using only Free Software and have a very functional setup, and you can have a life filled with great music from one of the many online sources of freely licensed music.

For most, this creation of new culture will be unpaid, but the instinct to tinker and the gratification of being a creator and not merely a consumer is a great motivation for many. And of course, as with all other things, the people who are most skilled will find ways to make money from their works, even if they are freely licensed.

I don’t know what it will take to create a truly free society, but I have no doubt that a large amount of Free Culture and Free software “bricks” will go a very long way!

Mike Linksvayer

2

Free Culture in Relation to Software Freedom

Richard Stallman announced the GNU project (GNU's Not Unix) to create a free operating system in 1983, making the free software movement at least 25 years old[1]. In a number of ways, free culture is harder to pin down than free software. No single event marks the obvious beginning of the free culture movement. Candidates might include the launches of the first Open Content licences (1998[2]), Wikipedia (2001), and Creative Commons (2002). One reason may be that there is no free culture equivalent of a free operating system - an objective that is clearly necessary, and for at least some people, sufficient to fully achieve software freedom.

This chapter compares and contrasts software and culture and the free software and free culture movements. The ideas herein formed, with my observations as a free software advocate working at Creative Commons for five years, then took the form of five presentations on the topic during 2008[3]. I gave the second to last of

[1] See http://ur1.ca/f6pj for my perspective on the 25th anniversary of GNU.

[2] See "10 Years of Open Content" at http://ur1.ca/f6pm by David Wiley, creator of the first open content licence.

[3] See http://ur1.ca/f6pp, http://ur1.ca/f6pr, http://ur1.ca/f6ps, http://ur1.ca/f6pv and http://ur1.ca/f6pw.

those presentations at FSCONS (not coincidentally, a conference dedicated to free software *and* free culture), the book version of which this chapter is being written for.

I start by examining differences between software and culture *as they relate to the need for and ability to collaborate across individual and organizational boundaries*, then move on to the implications of those differences for free software and free culture. Next I look at the history of each movement and indicators of what each has achieved - mostly by loosely analogizing free culture indicators to free software, the latter taken as a given. Finally, I attempt to draw some lessons, again mostly for free culture, and point out some useful ways for the free software and free culture movements to collaborate.

In this chapter I take "cultural works" to mean "non-software works of a type often restricted by copyright". Admittedly this is not perfect - software is culture (as is everything of human construction in some sense), some recognizably "cultural" works include software, and many non-software works are not usually thought of as "cultural".

While plenty may be said about the relative properties of cultural and software works usually recognized as such without creating precise definitions for each set, it is worth noting that Stallman, at least since 2000, has delineated three categories of works - functional (software, recipes, dictionaries, textbooks), representative (essays, memoirs, scientific papers), and aesthetic (music, novels, films)[4]. Although Stallman's evaluation of the freedoms required for representative works has had some unfortunate effects[5], these categories are very insightful and have some correspondence with my claims below that some cultural works more than others share similarities with software.

2.1 Obvious Software, Ubiquitous Culture

2.1.1 Reuse

The case for reusing software code is obvious, compelling, and pragmatic. If one can use or improve existing code, it often makes sense to do so rather than writing

[4]See http://ur1.ca/f6px (speech transcription, 2000) and http://ur1.ca/f6py (interview, 2002).

[5]Verbatim-only permissions for GNU essays on which I comment in another GNU 25th anniversary post at http://ur1.ca/f6q0 leading directly to an over-complicated Free Documentation Licence with non-free options, discussed briefly on The Software Freedom Law Show: Episode 0x16 concerning documentation licensing; see http://ur1.ca/f6q1.

new code from scratch. For example, if one needed a HTML renderer, it would be very difficult to justify starting over rather than using Gecko or WebKit, the renderers used most notably by the Firefox and Safari web browsers respectively, and also many other projects. On the other hand, the case for reusing software code is very narrow. If one is writing a device driver, code from an HTML renderer is useless, as is nearly all other software code.

Any particular cultural reuse does not seem necessary. If one needs music for a film soundtrack, any number of existing pieces might work, and one would hardly question a decision to create a new piece just for the film in question. However, no particular cultural reuse is absurd, excepting when absurdity is a cultural feature. Cat photos and heavy metal music can make a music video. I challenge you to think of *any* combination of artefacts that some artist could not incorporate together in a new work.

Software is usually fairly clearly used in some part of a “stack” and an entire stack forms a self-contained nearly universally multi-purpose whole - usually an operating system with applications. Cultural works can of course be layered, but don’t sort naturally into a “stack” - a film may need a soundtrack in roughly the same way a song needs a video, while a video player needs an audio codec, but not *vice versa*. There is no cultural equivalent of a shippable operating system.

2.1.2 Maintenance

Maintenance of software is almost necessary. Unmaintained software eventually is surpassed in features, becomes incompatible with new formats, has security holes discovered, is not included in current distributions, is only runnable on emulators, and if it is still useful, may be rewritten by a new generation of programmers who can’t understand or even can’t find the code. Non-maintained software is dead, or at least moribund.

A “maintained” cultural work is pretty special. Most are consumed verbatim, unchanged from the artefact originally published, *modulo* technical medium shifts. This may be a primarily 20th century phenomenon - beginning earlier for text, which could be mechanically reproduced on an industrial scale earlier. Arguably culture before mass reproduction required maintenance of a sort to survive just as much as software does - manual copying since the dawn of writing and repeated performance before that. It is possible to imagine a future in which a lack of truly mass media and tremendously powerful and accessible modification tools mean that in order to survive, a cultural work must be continually modified to

remain relevant. However, it is clear that at least now and in the recent past, an old verbatim cultural work is at least potentially useful, while old verbatim software work seldom is useful.

2.1.3 Modifiable Form and Construction

Software's modifiable form is roughly all or nothing - you have the source code or not. Some reverse engineering and decompilation is possible, but clearly source code is hugely more useful than binaries for modifying - including maintaining - software.

The modifiable forms of cultural works are varied and degradable. For example, text with mark-up is more useful than a PDF, which is more useful than a bitmap scan. Audio multi-tracks are better than a lossless mixdown, which is better than a high bitrate mixdown, which is better than a low bitrate mixdown, which is better than a cassette recording of an AM radio broadcast during a storm. At the extremes, the most preferred form is much better than the most degraded, but the degradation is fairly steady and all forms have potential for cultural reuse.

The closest to such steady degradation for software source code might be that commented code is better than uncommented code, which is better than obfuscated code, which is better than binaries, which are better than obfuscated binaries - but most of these forms are fairly unnatural - while it is hard to avoid encountering most of the continuum of modifiable form degradation for cultural works - except that the most preferred form is often unavailable.

Relatedly, there's a gulf in the construction of software and cultural works. Creating software is identical to creating its modifiable form. Creating cultural works often involves iteratively leaving materials on the cutting room floor or the digital equivalent.

It makes intuitive sense that that which does not degrade gracefully requires maintenance and that which does not degrade gracefully does not require maintenance, though it is unclear there is any causality in either direction.

2.1.4 Distributed Collaboration

The compelling case to reuse specific software and the need to maintain software means that individuals and organizations with similar needs are likely to benefit from using the same software - and for some of them to work together (closely or loosely) to maintain and improve the software.

Given lack of a compelling case for reusing specific cultural works and the lack of need to maintain cultural works means the need to collaborate across entity boundaries around *a specific work* is much lower - though there remains a strong desire to collaborate across entities around any number of cultural works, and once a project that cannot be completed by a single entity is under way or a work gains cultural significance, there can be a very strong need or desire for distributed collaboration around that specific project or work.

2.1.5 Wikis

Note that typical Wikis are somewhat like software in many of these respects. They require maintenance so as not to become stale and overrun with spam. Reuse may be more pragmatic and modifiable form more singular than most cultural works. Wikipedia is much more like a self-contained nearly universally multi-purpose whole than most cultural works.

2.2 Freedom

What do these differences in reuse, maintenance, and modifiable form mean for free software and free culture, in particular the latter relative to the former? Much has been written about software freedom, and there is wide agreement about what it entails. Distillations such as the Debian Free Software Guidelines[6], the Open Source Definition[7], and the Free Software Definition[8] almost completely agree with each other about which software is free (or open) and which is not[9].

Why software freedom? The Free Software Definition's four freedoms state (somewhat redundantly) things we want to be able to do with software - use, read and adapt, share, and improve and share improvements. More abstractly, free software grants users some autonomy (and the ability to get more), promotes a sharing ethic, facilitates collaboration, unlocks value, reduces transaction costs, makes distributed maintenance tenable, and arguably is congruent with and facilitation of broader social goals such as access, participation, democracy, innovation, security, and freedom[10].

[6] http://ur1.ca/f6q2
[7] http://ur1.ca/f6q4
[8] http://ur1.ca/f6q5
[9] See http://ur1.ca/f6q6 for a rare exception.
[10] Find a broad discussion of how free software and similar phenomena further these liberal goals in The Wealth of Networks by Yochai Benkler, available from http://ur1.ca/f6q7. I highlighted

2.2.1 Software Services and Fee Software and Free Culture

Software services delivered over a network have reignited the debate over what constitutes necessary software freedom. No doubt the rise of software services has aided and been helped by free software - the applications themselves are often not free software, but are usually built of and on top of many layers of free software, while the move of the most important applications to the web means that free software users only really need a web browser to be on a par with non-free users (there are important caveats, in particular the dominance of patent-encumbered media codecs, but the web is fairly clearly an equalizer). However, some see software services as a gigantic threat to software freedom. Not only is the source to most popular applications unavailable and not freely licensed, operations of software services are completely opaque, they have your data, and could shut down or deny you access at any time!

Among the vanguard that sees a problem in software services and an answer in more software freedom, there is broad agreement in outline, e.g., the Franklin Street Statement[11] and Open Software Services Definition[12] probably would agree most of the time on which services are free, but many details and a huge amount of practise remains to be worked out[13].

The Franklin Street Statement and Open Software Services Definition each recognize the need for content freedom. Private content makes things interesting, but both broadly agree on what constitutes free cultural works. Indeed, both build on definitions of freedom (or openness) for non-software works that plainly map software freedom to cultural works, the Definition of Free Cultural Works[14] and the Open Knowledge Definition[15] respectively.

2.2.2 Definitions of Freedom for Culture

These definitions have gained considerable traction - the former is used as Wikipedia's definition of acceptable content licensing and is recognized (reciprocally) with an "Approved for Free Cultural Works" seal on qualifying Creative Commons instru-

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the positive impact of free software and free culture on freedom and security in particular in another FSCONS 2008 presentation, see http://ur1.ca/f6q8.

[11] http://ur1.ca/f6qa; see http://ur1.ca/f6qe for my perspective.

[12] http://ur1.ca/f6qi

[13] See http://ur1.ca/f6qj for ongoing discussion of "free network services."

[14] http://ur1.ca/f6qm

[15] http://ur1.ca/f6qo

ments (public domain, Attribution, Attribution-ShareAlike)[16]. In debates about free culture licensing, it is regularly assumed and asserted that licences that do not meet the translated standards of free software are non-free.

However, there is some explicit disagreement about whether freedom can be defined singularly across all cultural works or that non-software communities have not arrived at their own definitions (Lawrence Lessig[17]) or that many cultural works require less freedom (Stallman[18]), to say nothing of graduated and multiple definitions in related movements such as those for Open Access[19] and Open Educational Resources[20]. More importantly, approximately two thirds of cultural works released under public copyright licences use such licences that do not qualify as free as in (software) freedom - those including prohibitions of derivative works and commercial use[21].

Does culture need freedom? As in free software? I take this as a given until proven otherwise, but the case for has not been adequately captured. The Definition of Free Cultural Works says "The easier it is to re-use and derive works, the richer our cultures become. ... These freedoms should be available to anyone, anywhere, any time. They should not be restricted by the context in which the work is used. Creativity is the act of using an existing resource in a way that had not been envisioned before."[22] So free as in software freedom culture is asserted to result in richer cultures.

The Definition of Free Cultural Works maps the Free Software Definition's four freedoms for works of authorship to (1) the freedom to use the work and enjoy the benefits of using it, (2) the freedom to study the work and to apply knowledge acquired from it, (3) the freedom to make and redistribute copies, in whole or in part, of the information or expression, and (4) the freedom to make changes and improvements, and to distribute derivative works[23].

[16] http://ur1.ca/f6qp

[17] Discussed at http://ur1.ca/f6qq; also see Lessig presentation at 23C3 available at http://ur1.ca/f6qr starting at 41 minutes.

[18] Ibid. 4.

[19] See http://ur1.ca/f6qu for an overview that unfortunately uses "libre" to indicate that at least some permission barriers have been removed, a much looser indicator than the standard of Free, Libre, and Open Source Software, which requires that all permission barriers be removed, with exceptions only for notice, attribution, and copyleft.

[20] See http://ur1.ca/f6qv for one conversation demonstrating lack of consensus on freedoms required for Open Educational Resources.

[21] http://ur1.ca/f6re

[22] Ibid. 14.

[23] Ibid. 14.

It is easy to argue that free culture offers many of the benefits free software does, as enumerated above: grants users some autonomy (and the ability to get more), promotes a sharing ethic, facilitates collaboration, unlocks value, reduces transaction costs, makes distributed maintenance tenable, and arguably is congruent with and facilitating of broader social goals such as access, participation, democracy, innovation, security, and freedom. And could lead to richer cultures.

2.2.3 Why Semi-Free Culture?

So why the semi-freedom (relative to free as in software freedom) granted by cultural licences that include terms prohibiting derivative works or commercial use? Are such terms helpful or harmful to the free culture movement? I don't know of any empirical work on why people use semi-free licences, but anecdotally reasons include not wanting others to change the meaning of a work (derivatives prohibition) and having a business model that depends on restricting commercial uses or having feelings that are sensitive to anyone profiting without you being part of the deal (commercial use prohibition).

Prohibition of derivative works seems particularly misguided and non-beneficial. Misguided because free licences do have limited mechanisms to restrict disagreeable uses - the licensee distributing a derivative work must describe changes made and must not imply endorsement of the licensor, while the licensor can mandate that credit be removed so they are not associated with the derivative and (unfortunately) retains "moral rights" against derogatory uses (these vary in strength around the world). Furthermore, given the diminution of fair use, fair dealing, and other copyright exceptions (which tend to be weakest where moral rights are strongest), lack of explicit permission to create derivative works is a free speech issue.

Most of the problems with prohibition of commercial use from a free culture perspective are comparatively well documented[24].

While the problems of semi-free licences should not be underestimated, there are some reasons for their existence, some reasons to think they are less problematic for culture than they are for software (where they have been roundly rejected) and some possibility that their impact is net positive.

Battles over file sharing are one reason. These may have reached their peak relevance around the time Creative Commons launched in December, 2002 (since then the web has become the increasingly dominant platform for sharing - and

[24] http://ur1.ca/f6qy

for media, period). People were (and are) getting sued simply for making verbatim works available via file sharing at no charge and many innovative P2P startups were shut down. Many in the copyright industries hoped that DRM, a threat to computer users, civil liberties, and free software specifically, would render file sharing useless. In this environment, merely allowing legal sharing of verbatim works would be a significant statement against shutting down innovation and mandating DRM.

Because reuse of cultural works is non-pragmatic relative to reuse of software code, it is possible that a derivatives prohibition on some cultural works is less impactful than such a restriction would be on software. Lower requirements for maintenance also mean that the importance of allowing derivative works is lessened for culture.

Restrictions on field of use (namely, commercial use) may also be less harmful for culture than they would be for software. Lack of interoperability is one of the problems created by non-commercial licensing. However, if prohibiting derivative works is less impactful in culture, so too are interoperability problems, which are triggered by the inability to use derivatives created from works under incompatible licences.

When distributed maintenance is important, non-commercial licensing is unusable for business - a commercial anti-commons is created - no commercial use can be made as there are too many parties with copyright claims who have not cleared commercial use. This is perhaps one explanation of why free software $\cong$ open source - although the latter is seen by some as business-friendly, to the detriment of freedom, businesses require full freedom, at least for software.

Maybe some artists want a commercial anti-commons: nobody can be "exploited" because commercial use is essentially impossible. If most of culture were encumbered by impossible to clear prohibitions against commercial use, the commercial sector disliked by Adbusters types would be disadvantaged. However, I suspect very few licensors offering works under a non-commercial licence have thought so far ahead. Among those who have thought ahead, even those with far left sympathies, seem to appreciate forcing commercial interests to contribute to free culture *via* copyleft rather than barring their participation.

Many licensors do want to exploit commerce under fairly traditional models. There is a case to be made that copyleft (e.g., ShareAlike) licences have an underappreciated and under-explored role in business models, but it certainly requires less imagination to see how traditional models map onto only permitting non-commercial use - the pre-cleared uses are promotional, while the copyright holder

authorizes sales of copies and commercial licensing in the usual manner. While businesses based on selling copies of digital goods are cratering, commercial licensing of digital goods (e.g., for use in advertisements) is a huge business. I do not know what fraction of this business results in creating derivatives of the works licensed, but it is at least possible that a significant fraction does not, and hence ShareAlike may be a poor business model substitute for commercial use prohibition.

By contrast, free commercial use is less impactful on the bulk of the software industry, which is mostly about maintenance and custom development. While impact on existing business models is not directly part of the calculus of how much freedom is necessary, high impact on existing business models may drastically limit willingness to use fully free licences. So while for software, semi-free licences may compete with free licences (fortunately the latter won), for culture semi-free licences may largely be used by licensors who would not have offered a public licence if only fully free licences were available, meaning that semi-free licences produce a net gain. It is entirely possible that many licensors offering works under semi-free licences would have used free licences if no prominent semi-free licences were available, producing a net loss or ambiguous result from semi-free licensing. I hope social scientists find a means of testing these conjectures with field data and lab experiments.

Although the direct impact of prominent licence choices on the freedoms afforded to cultural works is important, so is the indirect impact on norms and movements. One complaint about semi-free licences is that they weaken the consensus meaning of free culture - licensors can feel like they're participating without offering full freedom.

There is another, older consensus around "non-commercial" that doesn't have much if anything directly to do with licences, that we could return to - that non-commercial use should not be restricted by copyright, as the default. We are a very long way from reaching such a consensus, but it would be a huge improvement over the current consensus, that nearly all uses are restricted by copyright. "Huge" is an understatement.

It is at least possible to imagine widespread adoption of public licences with a non-commercial term as being an important component of a shift back to the second kind of non-commercial consensus. If non-commercial public licences were to have a positive role to play in this story, it seems two things would have to be true: (1) many more people use non-commercial public licences than would oth-

erwise use public licences if only fully free public licences were available; and (2) use of non-commercial public licences sets a norm for the minimum freedom a responsible party would offer rather than all the freedom people need. In other words, the expectation should be that if you don't at least promise to not censor non-commercial uses, you're an evil jerk, but if you only promise to not censor non-commercial uses, you're merely not an evil jerk.

As someone who strongly prefers fully free licences, I even more strongly prefer to see effort put into building and promoting free cultural works rather than bashing semi-free licences, for roughly three reasons: (1) use of semi-free licences could have a positive impact, to the extent they don't crowd out free licences (see above); (2) building is so much more interesting and fun than advocacy, especially negative advocacy - in the history of free software, the people who are remembered are those who built free software, not those who sniped at shareware authors (roughly equivalent to semi-free licensors); and (3) pure rationalization - as of this writing, I work for an organization that offers both free and semi-free public copyright licences.

It is unsurprising Stallman only supports cultural freedom necessary for free software, rather than that which is necessary for building equivalently free culture - software freedom is his overriding mission. Although he has not made such a claim, and has a coherent explanation for why works of opinion and entertainment do not require full freedom[25], there is a case to be made that semi-free cultural licences do everything necessary to facilitate free software, e.g., allowing format shifting (to non-patent encumbered formats) and presenting a counter-argument to mandating DRM.

It should be noted that for some communities free as in free software is not free enough, for example the Science Commons Protocol for Implementing Open Access Data[26] claims that only the public domain (or its approximation through waiving all rights that are possible to waive) is free enough for scientific data.

2.2.4 Copyleft Scope

Copyleft scope or "strength" is another theme that cuts across free software and free culture, possibly differently. In software, copyleft strength ranges from zero (permissive licences) to limited (LGPL) to what most expect (GPL) to including triggering by offering an interface over a network (AGPL). It is possible to imagine

[25] Ibid. 4.
[26] http://ur1.ca/f6r0

taking copyleft strength to an absurd limit - a licence that only permits licensed code to run in a universe in which all software in that universe is under the same licence.

For culture, copyleft strength depends on what constitutes an adaptation that triggers copyleft (ShareAlike). For example, version 2.0 of the Creative Commons licences explicitly declared that syncing video to audio creates a derivative work[27], and thus triggers copyleft. There is debate concerning whether "semantically linked" images with text triggers copyleft[28].

If the goal is to expand free universe, optimal copyleft is where the opportunity cost of under-use due to copyleft equals the benefit of additional works released under free terms due to copyleft at the margin. Again, there is an opportunity for social scientists to address this question, possibly with field data, certainly with lab experiments.

2.3 Relative Progress of Free Software and Free Culture

Given differences between software and culture, one may expect free software and free culture to progress differently. One quick and dirty means to gauge their relative development is to list the years of milestones in each field, as I have done in the table below. These are certainly not the best milestones for comparison - particular licences are over-emphasized - the reader is urged to render this analysis obsolete by publishing better analysis.

If crude analogies can be made between free software and free culture project timelines, what do they indicate?

Perhaps the earliest massive community software project is Debian, started in 1993. Wikipedia began 8 years later, in 2001. Wikipedia's success came faster, more visibly, and within the context of its field, far greater. Wikipedia exploded the encyclopaedia category - comparison to previous encyclopaedias is fairly ridiculous as Wikipedia is orders of magnitude bigger and excels for many uses completely out of scope for an encyclopaedia, perhaps most obviously as a database and current events tracker.

Debian is a very successful GNU/Linux distribution and an even more interesting community, but has not remotely exploded the GNU/Linux distribution cat-

[27] See http://ur1.ca/f6r1 for a post announcing and explaining changes in version 2.0 of the Creative Commons licences.

[28] See part of the debate at http://ur1.ca/f6r3

egory, let alone the computer operating system category. Nor has Ubuntu (2004), a commercially supported distribution based on Debian, that has greatly increased the market share of Debian-based distributions. In contrast, there has been some commercial activity around Wikipedia content, it is uninteresting and unimpactful relative to the main project. Wikia, a commercial wiki hosting venture using the same MediaWiki software as Wikipedia, but not a substantial amount of Wikipedia content, could be very roughly analogized to Ubuntu. Wikia is successful, but not relative to Wikipedia.

Free Software	Free Culture
1983: Launch of GNU Project	1998: Open Content Licence
1989: GPLv1, Cygnus Solutions	1999: Open Publication Licence
1991: Linux kernel, GPLv2	2000: GFDL, Free Art Licence
1993: Debian	2001: EFF Open Audio Licence, launch of Wikipedia
1996: Apache	Other early 2000s open content licences (some of them Free): Design Science Licence, Ethymonics Free Music Public Licence, Open Music Green/Yellow/Red/Rainbow Licences, Open Source Music Licence, No Type Licence, Public Library of Science Open Access Licence, Electrohippie Collective's Ethical Open Documentation Licence.
1998: Mozilla, "open source" term coined, IBM embraces Linux, other open source software	2002: OpenCourseWare, Creative Commons version 1.0 licences
1999: Cygnus acquired by Red Hat	2003: PLoS Biology, Magnatune
2000: .com bubble peaks and pops, includes open source bubble	2004: CC version 2.0 licences
2002: OpenOffice.org 1.0	2005: CC version 2.5 licences
2004: Firefox 1.0, Ubuntu	2007: CC version 3.0 licences
2007: [A]GPLv3	2009: Wikipedia migrates to CC BY-SA
????: World Domination	????: Free Culture

Table 2.1: Selected free software and free culture milestones.

Many of the licences from this period are described at [1].

The canonical free software business is Cygnus Solutions (best known for work on the GNU Compiler Collection, perhaps the most "core" software in the free stack), started in 1989 and acquired by Red Hat in 1999. There is no canonical free culture business, but Magnatune (a record label) has often been held up as a leading example, started 14 years after Cygnus. Cygnus was acquired by Red Hat in 1999, while Magnatune's long term impact is unknown. Unlike Cygnus, Magnatune uses a semi-free licence (CC BY-NC-SA), so for some it may not even qualify as a free culture business.

Wikitravel (collaboratively edited travel guides) is another early free culture business - both a business success, having been acquired by Internet Brands[29], and using a fully free licence (CC BY-SA).

Like Magnatune and unlike Cygnus, Wikitravel could not be said to be near the "core" of the free stack - probably because there is no such thing for culture, excepting fundamentals such as human language and music notation that fortunately reside in the public domain.

Another point of comparison is investment and resistance from major corporations. In 1998 IBM's beginning of major investments in free software was a business adoption landmark. No analogous major investments have been made in free culture. Most large computer companies have now made large investments in free/open source software. In 1998 Microsoft was a bitter opponent of free software - many would say they still are[30]. In 2009 Microsoft's public messages and its activities, including release of some software under free licences, is considerably more nuanced than a decade ago. In 2009, big media still largely has its head buried in the sand - and continues to randomly kick and punch its customers from this position. Could Microsoft's *animus* towards openness a decade ago, be loosely analogous to big media's Neanderthalism today?

2.3.1 Licence Deproliferation

One difference in the development of free software and free culture not fully revealed by the table above (because it only mentions versions of the GPL for software licences) is that free culture has not experienced licence proliferation as free software has - and has even experienced licence deproliferation. In 2003 the author of the Open Content and Open Publication licences recommended using a Creative Commons licence instead[31] and PLoS adopted the Creative Commons Attribution licence. In 2004 the EFF's Open Audio Licence 2.0 declared that its next version is CC Attribution-ShareAlike 2.0[32]. There have been no significant new free culture licences since 2002. In June, 2009 Wikipedia and other Wikimedia Foundation

[29] See notice of the acquisition at http://ur1.ca/f6r4 as well as my comments at http://ur1.ca/f6r5. I also highly recommend Wikitravel founder Evan Prodromou's advice for businesses involving community wikis or other tools with "WikiNature" - see http://ur1.ca/f6r6 and my commentary at http://ur1.ca/f6r8.

[30] See for example http://ur1.ca/f6r9.

[31] David Wiley discusses the history of the Open Content License and Open Publication Licence at http://ur1.ca/f6rb.

[32] See the Open Audio License v2 at http://ur1.ca/f6rd.

projects migrated from the FDL to CC Attribution-ShareAlike 3.0 as their main content licence[33].

Presumably this difference is largely due to both free culture having had the benefit of over a decade of free software learning - including learning through making many new licences - and that a fairly well-resourced organization, Creative Commons, was able to establish its central role as a creator of free (and semi-free) culture licences relatively early in the history of free culture licences. It should be noted that Creative Commons was able to be relatively well-resourced early due to the pre-existing success of free software - both because such success made Creative Commons' plan credible and directly via donations from a fortune made in free software[34].

However, some of the difference in proliferation may be due to the narrow case for reuse of specific software and broad case for reuse of specific culture. Licence proliferation may actually be less harmful to software than culture, since most combinations of software in a way that would create a derivative work are absurd, while no such combinations of culture are - so most of the time it doesn't matter that any given pair of software packages have incompatible free licences. Still, licence incompatibility does especially hurt free software when it does happen to be material, and proliferation guarded against and compatibility strived for.

2.4 How Free Can We Be?

Generally culture is much more varied than software, and the success of free culture projects relative to free software projects may reflect this. It seems that free culture is at least a decade behind free software, with at least one major exception - Wikipedia. Notably, Wikipedia to a much greater extent than most cultural works has requirements for mass collaboration and maintenance similar to those of software. Even more notably, Wikipedia has completely transformed a sector in a way that free software has not.

One, perhaps the, key question for free culture advocates is how more cultural production can gain WikiNature[35] - made through wiki-like processes of community creation, or more broadly, peer production[36]. To the extent this can be done,

[33] For my take on this migration see http://ur1.ca/f6rf and http://ur1.ca/f6rg.

[34] Early Creative Commons funding came from a foundation started by Bob Young, the founder of Red Hat. See pp. 102-103 of Viral Spiral by David Bollier, available at http://ur1.ca/f6ri.

[35] http://ur1.ca/f6rj

[36] See http://ur1.ca/f6rk for one discussion of relevant terminology.

free culture may “win” faster than free software - for consuming free culture does not require installing software with dependencies, in many cases replacing an entire operating system, and contributing often does not require as specialized skills as contributing to free software often does.

A question for those interested specifically in free software and free culture licences is what is the impact of different licensing approaches - in particular semi-free licences, copyleft scope, and incompatibility and proliferation. I don’t think we have much theory or evidence on these impacts, rather we hold to some “just so” stories and have religious debates based on such stories. If we believe the use of different licences have significantly different impacts and we want free software and free culture to succeed, we should really want rigorous analysis of those impacts!

One final point of comparison between free software and free culture - how free can an individual be? Now it is just possible to run only free software on an individual computer, down to the BIOS if one selects their computer very carefully. However, visit almost any web site and one is running non-free software, to say nothing of more ambient uses - consumer electronics, vehicles, electronic transactions, and much more. Similarly one could only have free cultural works on a computer[37] (not counting private data), though visiting almost any web site will result in experiencing non-free cultural works, which are also ambient to an even greater extent than is non-free software. My point is not to encourage living in a cave, but to elucidate further points of comparison between free software and free culture.

One final question of broad interest to people interested in free software or free culture - how can these movements help each other? What are the shared battles and dependencies?[38] Knowledge sharing and dissemination is an obvious starting point. To the extent processes or conceptions of freedom are similar, learnings and credibility gained from successes (and learnings from failures) are transferable.

We should set high goals for free software and free culture. Freedom, yes. We should also constantly look for ways freedom can enable “blowing up” a category, as Wikipedia has done for encyclopaedias. The benefit to humanity from more

[37] I don’t know anyone who does this consciously, which perhaps indicates the hard-core free software movement also leads the hard-core free culture movement - there are many people who try very hard to only run free software on their computers. For the record on my computer I run Ubuntu, which is close to but not 100% free and my cultural consumption consists of a higher proportion of free cultural works than does anyone’s I know, though nowhere near 100% - e.g., see `http://ur1.ca/f6rl` or `http://ur1.ca/f6rm` for data on my music consumption.

[38] For example, see `http://ur1.ca/f6rn`.

freedom should not just be more freedom (or, per an uncharitable rendering of the open source story, only fewer bugs), it should include radically cool, disruptive, and participatory tools, projects, and works. *King Kong*, sometimes shorthand for expensive Hollywood productions that free culture can supposedly never compete with - this is far too low a bar!

Stefan Larsson

3

The darling conceptions of your time,

or: Why Galileo Galilei sings so sadly in the chorus

3.1 Law, social change and conceptions

"People in power get to impose their metaphors", wrote Lakoff and Johnson in their ground-breaking work Metaphors we live by, on structures of metaphors and concepts and the manifest part in human thinking and communication that metaphors and concepts play. They strengthened the idea that human thought processes are mainly metaphorical and said that the "human conceptual system is metaphorically structured and defined". By "metaphor" they actually meant "metaphorical concept"[2]. Their work inspired many disciplines to develop in this direction.

Conceptions, like metaphors, carry with them a heritage of the context from which they were derived. They are not always easily translated from one context to another without some kind of distortion. One can go even further: conceptions and metaphors are ways of thinking. They describe the way we understand life, our world and our place in it. The problem is that metaphors and conceptions can be both informative and deceptive. They can be taken from a context where they function well, to be used in a context where they deceive and distort (see for instance [3]). The starting point of this article is that conceptions can be tied to a

specific world order, to a way in which a society is organized: in its politics, administration, government and, very importantly, its regulation. This leads to what the title asserts: societies change and the conceptions that have been more or less deeply founded in them can face problems when translated into a new context. This article uses the examples of file sharing and Internet and copyright legislation to show the clashes of such a societal transition and the conceptions embedded. And it does this via the lyrics of a song about the astronomer Galileo Galilei. Before I go into detail on this perhaps unexpected diversion I want to elaborate the role of technology in relation to social norms and legal regulations.

This article is about metaphors, or rather conceptions, and about law and social change connected with technology. Technology often has an important role in social and normative transitions[4]. Digital technology has changed the conditions of communication and has therefore caused a changed behaviour in society in connection to what can be perceived as normative change, for instance regarding file sharing of media content. To illustrate the battle of conceptions tied to this I use the example of stealing/sharing. What from an analogue perspective is seen as theft, an action with highly negative connotations, is from a digital perspective seen as something else, with less or no negative connotations. Normatively, one could say that these actions are not comparable. Technology can be seen as the prime mover of the social changes creating the contemporary copyright dilemma. I am focusing on technology in the sense that other parallel processes that are part of the paradigmatic transition are neglected (for a grander picture, see [5, 6, 7], and for a stronger focus on law and legislative paradigmatic change in a global perspective, see [8, 9]), but I am still interested in the consequences of how technology rearranges society and creates various conditions for norms.

Each society regulates differently. One can here talk about rules of the game. Every society, like every game, has its own set of rules that define that society or that game. Historically, social evolution has often been connected to technological innovations. The combustion engine took a central position in what later became known as the industrialized society, an urbanizing era of factories and production, following the rural society tied to agriculture and trade (see [10, 11, 12]). With each type of society comes a specific type of legal “darling” conceptions tied to the patterns of behaviour relevant for this type. Some conceptions are in conflict when society changes, some new conceptions emerge.

In general, some of the conceptions embedded in law and the debate around, for instance, file sharing are dependant on the preconditions of reality, which also

form the conceptions that are used in legal regulations. The aim of this article is to highlight and describe a few of the conceptions that have been developed under conditions for communication and media distribution other than what prevails today. A fact that creates a tension between regulation and reality. But, what has the song I mentioned about Galileo Galilei to do with this?

When working on an article in Swedish for an anthology published in the fall of 2008, I decided, being both a socio-legal scholar and a musician, to write a song that pedagogically illustrated the problem both in its lyrics and in the fact that it was to be released under the Creative Commons Licence Attribution, non-commercial. Both the book, *FRAMTIDSBOKEN: vol 1.0*[13], and the song were released online and could be downloaded freely. It meant that the song was neither buyable nor sellable (according to the licence). It could not be used for commercial activities without my consent. You could say that the song embraced the power of the flow, rather than the flow of power. It was, and of course still is, shareable, searchable and downloadable.

A couple of principally very interesting conceptions that create a high amount of tension in society today are tied to online behaviour, content distribution and legal regulation. The idea of letting a song display the issue is pedagogically of double interest. I use a song because it is a question of transition and the music medium will here illustrate change. It also illustrates the search for darling conceptions of our time, by revealing, discussing and challenging them. It is also a test. To practically look to the ideas of creative commons licences as a way for creators to make the rights granted by law – copyright law – a little less protective by the consent of the creators, and likely a little more adapted to the practice of Internet, file sharing and flow of media. You could say that the song forms a meta-pedagogical display: it both tells the story of societal transition in terms of a battle of conceptions, as well as in itself exemplifying a contemporary issue regarding legal regulations and social change when released for free sharing online. The song is about Galileo Galilei and is called *The darling conceptions of your time*.

3.2 Galileo Galilei and the Darling conceptions of your time

Conceptions and metaphors are ways of understanding things. They can be the results of a social construction, meaning that it is not a matter of true or false. It is

a construction made to serve a purpose. A metaphor, for example, is not necessarily more true because it has been around for a longer time than a newer one.

Let us turn to the first two verses of the song that will continually (and fictitiously) play along while the reader reads the article. Picture a three man combo playing in the corner of a bar. Every now and then a few lines of what they are singing are heard through the murmur of the crowd scattered throughout the room. You see a double bass, hear the soft snare drum and suddenly a voice starts to sing:

I see a learned man watching the sky
His mind is forming a question
He trembles when he starts to realize
There is something wrong with how the sun passes the sky
There is something wrong with how the sun passes the sky

The court declared the conviction
and the mumbling crowd awaited no reply
It expected no contradictory claims
There is nothing wrong with how the sun passes the sky
There is nothing wrong with how the sun passes the sky

These are the two opening verses of the song “The darling conceptions of your time”. Think of the famous astronomer Galileo Galilei as the “learned man watching the sky”. Galileo Galilei found out something that clearly challenged a darling conception of his time. Earth was not central in the planetary system surrounding us in space, the sun was. In addition to this, he proved this bold statement empirically. He constructed a pair of binoculars, made the mathematical calculations, and concluded that he had a new truth to reveal. The earth was not in the centre of the universe as we know it. The planets can not be revolving around the earth: “Earth is revolving around the sun, and I have seen it!” The Church was outraged (on Galilei, see for instance [14]).

A remarkable fact is that he was not even the first one to make the claim. Copernicus had mathematically come to the same conclusion a couple of years earlier. That is why it is called the Copernican view. He did not however look, empirically measure and see that the sun could not be rotating around earth. He was also not punished as harshly by the Church, which also acted as a court, as was Galileo. Galileo came to a cross roads where he had to choose between the truth, as he had investigated it empirically, and the law, which found his deeds to be wrong.

To challenge some of the darling conceptions can be experienced as a challenge to the system, which was likely in this case. It was not merely about the planetary organization in space, it also questioned who should be the true interpreter of the order of things. It was about who should have power over the conceptions that should rule as truth. Galileo challenged this and as a result had to choose between standing by his findings and risking his life or to deny what he regarded as true and staying alive.

He chose life. Maybe truth seemed a little less important when faced with the risk of being burned on a pile of wood. Maybe truth even seemed a little less right. “And still it is moving”, he allegedly said very quietly, sitting on his chair on a podium, surrounded by a hostile and mumbling mob on either side and behind him. In front of him sat the tribunal, which is the court of the Church, and the very same court that had accused him. Galilei spent his remaining days in house arrest.

As indicated by the very first sentence in this article, the one from Lakoff and Johnson, the conceptions that prevail have some kind of connection to power. The law is a commonly used instrument of control by the State. A successful law not only imposes behaviour, but also often conceptions of how the world is and should be arranged. However, in a connected world the centralised power is challenged in some aspects. The social norms that control behaviour on the Internet do not necessarily apply to a legislation that functioned well in a pre-digital era. As put by Castells:

> “. . . the power of flows take precedence over the flows of power.”[15]

It has to do with a transition, the view of the world, and what the prerequisites are when it comes to communication between peers and distribution of media content. One could express it as if earth is the natural scientific depiction of our planet and the world is the social construction that social science deals with. There are structures in society – legal, economic and social – that interact and depend on each other. When prerequisites drastically change, there is a need for a new balance in these structures. Finding this balance takes time, and will create winners and losers along the way. This applies, for instance, to the structures of news and media production in a centralised society, as it shifts towards a more decentralised version of possibilities in finding alternative media, alternative broadcasts, alternative methods of production, or even co-production of media content. This rips the keys out of the hands of the former key holders within news organisations, governments and media producers. Social science has to deal with the conceptions embedded in

the conflict, to sort out the old and describe the new that may take its place, just like Galileo. Over time, the strong influence of the Church declined and its role as the interpreter of truth regarding earth's place in space was lost. The scientific approach evolved, a school of reason and empirical sciences took a greater place in society.

3.3 The battle of what the Internet should be

In a historical sense, the Internet is very new. The impact of digitalisation has however in a short time led to what Castells describes as the Network Society. How the Internet was designed in terms of what type of information that would be embedded in the communication was paradigmatically different from how most legal regulation and legal systems have been constructed. Legal systems generally operate in a national domain, relying on information regarding where an action has taken place geographically, as well as the age of a person if there is a special relation between involved individuals etc., in order to find out if the action was criminalised or not, as well as how hard the actions should be penalised within given restrictions. The Internet lets people act across national borders without revealing their ages, whereabouts or what relationships people have. The communication is, or at least has been, this free. This type of freedom, or lack of control, is under attack from strong legislators throughout the world, where the traditional media industry is a heavily investing instigator and lobbyist. More layers of control over the flows of the Internet mean that existing analogically preconditioned models for the market can survive. On the other side stand the critics claiming that the control needed for these models to still function is such an utterly over-dimensioned control that it threatens grand values such as privacy and free speech. Questions that need to be addressed here are what balance should we strive for, what is lost and what is gained when more aspects of control are added to the layers of the Internet? And in the case of copyright, is this for the sake of creativity or for the sake of an industry with an aged market model? In order to understand this we need to take a brief look into the copyright construction.

3.4 Copyright

The origin and growth of copyright as a legal concept is intertwined with the technical development in regards to the conditions for storing and distributing the created

media; the melody one wrote and recorded, the book, the photograph and so on. If we focus on music, we will see how copyright and technology have developed side by side. But also, which is interesting to note, how creativity itself is influenced by the preconditions in technology. One purpose of copyright is the creation and development of culture (if we want to dig into Swedish law-making history, the preparatory work for the Swedish copyright law states this, SOU 1956:25 s 487). The legal regulation in itself has no justification in addition to stating systemic conditions that are culturally stimulating and ensuring future innovations.

Copyright law is amazingly homogeneous throughout the globe as a result of international co-operation with treaties and conventions. Both the European Union and the U.S. have added to a strong and homogeneous copyright throughout major parts of the world. A few of the characteristics that can be found in most national copyright legislations are that:

- the period of protection lasts the life of the copyright holder + 70 years (sometimes 50, see the Berne Convention and the TRIPS Agreement[1])

- the period of protection for those companies who own the recordings (related rights) are mostly 50 years (see the Rome Convention[2])

- no registration is needed to achieve copyright when something is created (disputes will be settled in court. The U.S. used to have some demands – the year and the © symbol, but that is less important these days when everyone has signed the same treaties)

- copyright means exclusive rights to the created for the creator or the holder of these rights (which is a very important distinction) that are economic – for instance control over the copies and to sell them – and moral – that is to be attributed (mentioned) and not have the work ridiculed, for instance

- the exceptions from these exclusive rights are for "fair" use in the U.S., which is the sharing of copies to *a few* friends, like in the Swedish regulation, within the private sphere. All depending on what type of creation

[1]Berne Convention for the Protection for Literary and Artistic Works, last amended at Paris on 28 September, 1979. Sweden signed on 1 August 1904 and has adopted all the amendments of the Convention after that. Agreement on Trade-Related Aspects of Intellectual Property Rights signed in Marrakech, Morocco on 15 April 1994.

[2]The International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations.

and for what circumstance. The line is drawn a little differently in different countries

These characteristics have mainly been developed during the twentieth century and are very much tied to a technological development that has allowed distribution of content[3]. These characteristics have been developed in an analogue setting where heavy investments were needed for most of the production, reproduction and distribution. Some of the characteristics show examples of being darling conceptions of an industrialized society which has been embedded in incredibly well-spread, global and strong regulations. At the same time, some of these characteristics are now challenged due to the changes in preconditions for production, reproduction and distribution that the digitalisation and rise of a network society contributes to.

An example: the concepts and specific terminology of Swedish copyright stems to some extent from the preparatory works of 1956, prior to the Copyright Act from 1960 (it speaks of the expanding possibilities of reproducing sound with innovations such as the magnetophon – basically an early and huge tape recorder). Of course, the act has continuously been changed over the years, but many of the terms are still used. This development has led to a legal regulation that is so complex that even legal experts think it is complex. In fact, when some additions were made to the law in 2005 (to harmonize with the INFOSOC EU directive) the real experts on legal construction in Sweden, the Council on Legislation (Lagrådet), concluded that it had been desirable to do a complete editorial review of the Copyright Act instead of implementing the "patchwork" that the changes in the law now meant. The Council however stated that it understood the hurry to implement the directive (Prop 2004/05:110, appendix 8, p 558). Sweden had already received a remark from the EG Court for a delay[16].

This shows two things. It shows that the architects behind the legal construction thought analogically, and it shows the strong interconnection that the many national legislations have *via* international treaties as well as the European Union. The freedom to rethink copyright law is limited, or at least not easily made, seen in the international perspective. Still, the regulating process seems to lack a critical element in the legislative trend so far. The policy makers seem to be beyond all doubt

[3]Of course, printed material reached a distribution revolution after the Gutenberg press and legal protection and the ideas of copyright has been around before the twentieth century. But it was the 1886 Berne Convention that set out the scope for copyright protection which originally meant maps and books but today has grown to become a significant regulated conception in relation to sound recordings, films, photographs, software etc.

that the legislative tradition on copyright is not only to be followed but the protection should also be expanded. A strong and unified copyright (see for instance the INFOSOC directive[4] in the EU) and a strong enforcement of this copyright (for instance the IPRED[5]) are in this perspective seen as the only measures that will ensure innovation and creativity in society. There seems to be no room for doubt here. If copyright protection is failing, the only answer to be reached in this way of thinking is to enhance the enforcement, the control of data streams and all online behaviour.

Another example from Sweden would be the so called Rehnfors investigation from 2007. The investigation regarded music and movies on the Internet and was conducted by the governmentally appointed Cecilia Rehnfors (Ds 2007:29). The investigation concluded that the legal services on the Internet often had an unsatisfactory range of content to offer, but also launched the idea that the Internet operators should be given a responsibility to control that their subscribers did not participate in copyright infringements. This proposal was of course met with great opposition from the operators (Dagens Nyheter 3 September 2007). The increased operator responsibilities had been proposed by copyright organizations, such as IFPI (Ds 2007:29, p 207). The development of technical safety measures was seen as a key issue (Ds 2007:29, p 16).

The issue of file sharing and media content was up for a hearing in the Swedish Parliament in April 2008. However, even the setting can be questioned from a society in transition perspective: only legal alternatives were allowed to present their case. No advocates of file sharing were invited to the hearing. It was stated by a spokesperson for the hearing that:

> "Several people can bring forward the arguments that for instance the Pirate Bay has, such as the secretary of the Rehnfors investigation [see Ds 2007:29 above] Johan Axhamn. He knows most of the arguments" (`http://ur1.ca/f6pd` 12 Mar 2008, author's translation).

There was no one representing the file sharing community, even though the purpose of the hearing was to speak about and to collect knowledge regarding how the issue of file sharing and copyright issues should be handled. This is an unbalanced approach that is problematic if one attempts to understand the dilemmas of

[4]Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

[5]DIRECTIVE 2004/48/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 29 APRIL 2004 ON THE ENFORCEMENT OF INTELLECTUAL PROPERTY RIGHTS.

modern copyright, to say the least. It also illustrates how conceptions legally formalised can blind real attempts to solve problems connected to societal transition.

3.5 A legal trend

The development towards an increased protectionism in copyright, and the proposals of how this protection should be undertaken, is part of a legislative trend seeking to take control over the Internet and its communication. The exceptionally stormy debate regarding increased governmental signals intelligence (scanning internet traffic) is a national Swedish example (Ds 2005:30, prop. 2006/07:63) from the Summer of 2008. The new law was heavily questioned, resulting in the forming of interest groups to stop it. A wave of bloggers protested, and members of Parliament received lots of e-mails and letters begging them to vote no.

To describe the European legal trend I start at 2001 when the European Community Directive on Copyright in the Information Society, *the INFOSOC Directive*, was passed which included narrow exemptions to the exclusive rights of the rights holder as well as protection for "technological measures" (art 6). This meant that more actions were criminalized and that the copyright regulations around Europe generally expanded and became stronger. In April 2004 the EU passed the Directive on Enforcement of Intellectual Property Rights, the so called *IPRED directive*, following what has been called "a heavy-handed influence of the American entertainment industry"[17]. It had been set up as it is "necessary to ensure that the substantive law on intellectual property, which is nowadays largely part of the *acquis communautaire*, is applied effectively in the Community. In this respect, the means of enforcing intellectual property rights are of paramount importance for the success of the Internal Market." (Recital 3). The IPRED directive also states that all Member States are bound by the Agreement on Trade Related Aspects of Intellectual Property (TRIPS Agreement), which aligns the global regulatory connection on copyright between nations, the EU as well as international treaties. After the bombings in Madrid in March 2004 the work started on what later became the so called *Data retention directive* in order to force Internet service providers and mobile operators to store data in order to fight "serious crime"[6]. This was heavily criticized by both the Article 29 Data Protection Working Party as well as the Euro-

[6]DIRECTIVE 2006/24/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC.

pean Data Protection Supervisor for lacking respect for fundamental human rights. The question still remains in the Swedish implementation whether or not this can or will be attached to copyright crimes and be used in connection to the IPRED legislation, depending on how “serious crimes” will be defined in national law in relation to copyright crimes. Recently it is *the European Telecoms Reform Package* that has been heavily debated. It was presented to the European Parliament in Strasbourg 13 November 2007 but voted upon 6 May 2009.

This cluster of legislation seeking to harmonize the national legislations of the European Union all points to the obvious trend of adding control over the flows of the Internet.

3.6 Darling conceptions

What are the darling conceptions tied to the legal order that creates the tension in relation to the digital practice of today? There are a few conceptions that are problematic in the transition to a digitalised society. Legitimacy is a key question here. However, before we are even able to discuss questions of legitimacy, we need to sort out a few things regarding the ideas and the meaning of both law and the debate around copyright and legislation.

3.6.1 Theft

When the idea of property rights are formed in an analogue reality and transferred to a digital one, certain problems occur. An obvious problem, which has shown the two sides of viewing the handling of media content in the debate, is the sharing and copying of internet communication on one side and the “theft” on the other side. When seen from a traditional point of view, the illegal file sharing of copyrighted content has been called theft. However, the metaphor is problematic in the sense that a key element of stealing is that the one stolen from loses the object, which is not the case in file sharing, since it is copied. The Swedish Penal Code expresses this as “A person who unlawfully takes what belongs to another with intent to acquire it, shall, if the appropriation involves loss, be sentenced for theft to imprisonment for at the most two years” (Penal Code Chapter 8, section 1, translation in Ds 1999:36). To be specific, the problem of arguing that file sharing is theft lies in the aspect of “if the appropriation involves loss”. There is no loss when something is copied, or the loss is radically different from losing, say for instance your bike. The loss lies in that you are likely to lose someone as a *potential* buyer of your

product. The “theft” argument is an example of how an idea or conception tied to a traditional analogue context is transferred to a newer, digital context. Something is, however, lost in the translation.

3.6.2 Control over copies

The global construction of copyright has resulted in fairly homogeneous copyright laws throughout the world. This has been done *via* international agreements (such as the Berne Convention and the TRIPS agreement), harmonisation within the European Union (such as the INFOSOC directive of 2001), and copyright cooperation amongst for instance the Nordic countries in Europe. A part of this construction is the control of copies that the rights holders are granted. As mentioned above, this can be seen as a logic and conception that was born and functioned well in an analogue reality. Control was still possible, unlike today’s enormous task to control all online activities for all people, regardless, if the behaviour has to do with illegal file sharing or not. In a time where production, reproduction and distribution of each copy demanded an investment that was not ignorable, the legal protection of the control over copies makes sense. On the other hand, in a time where reproduction and distribution costs are ignorable the legal protection of the control over copies does not make the same self-evident sense. The development is probably that the market is moving from being product based to being service based. You deliver access to media rather than selling it in pieces. The control of copies, and the idea that it is the copies that need to be controlled in order to have a functioning market, is a darling conception of analogue times.

3.6.3 Private/public relationship

Generally, in Swedish legal tradition, the private sphere has been left unregulated. The copyright legislation has followed this logic, such as section 12 in the Copyright Act above. With digitalisation and organisation in networks, this private-public dichotomy has become a regulatory conception that has less and less value in society. The private is not so private and the public is not so public any more, in a sense. It is a regulatory method that functions less and less well, at least in the field of copyright. The item-based reality of an analogue production has now become digital and copy-based. Behaviour and societal norms change in accordance with how the conditions for them change. As the user generated web (2.0, as some call it) arises, many industries go from being producer driven to consumer driven,

and copyright is unavoidably affected by the introduction and distribution of new information technology. This leads to questions about integrity and what type of society we want.

3.6.4 Creativity of the few produces for the consumption of the many

Behind this conception lies the idea of an investment demanding production and distribution, mentioned above. This conception stems from the idea that a few key persons decide what the masses will need and like. Think about the few big record companies or the old state owned TV channels in Sweden. It also applies to the traditional logic of news reporting. What is regarded as news was a centralised decision to make. “Democratize democracy” said the socio-legal scholar Boaventura de Sousa Santos when speaking of the empowerment of the third world at a conference in Milan in the Summer of 2008. Let us think about that quote for a moment. It is about a model for decision-making. The Internet stands for a widespread decision-making of content. It is the many who decide what is interesting, not the few key persons. The quote could be used for saying: do not construct systems around a few key persons of power when it comes to the potential creativity of the masses. Democratize creativity in the system, because creativity should not be decided over by the few. Let the many decide. Democratize democracy.

The “democratic culture” is an expression used by John Holden[18] to describe what in some areas of the industry is called Web 2.0, meaning that content in online products is to a large extent created and driven by the users. It is as a peer-to-peer product rather than an ever so smart product originating from the wits of one genius. Compare a traditional centrally produced encyclopaedia to the collectively produced Wikipedia. Some solutions can not be thought out centrally, and nothing singular can replace the social web. This is a beneficiary aspect of “the flow” of media content that the digitalisation brings with it.

3.6.5 Ownership and property

The Swedish legal scholar, Dennis Töllborg, regards the introduction of the Internet as a hegemonic revolution, similar to those earlier in history when our view on society and ourselves were radically changed. Creation is still central and imitation is always strong as a model for norm-building, but there is a difference, and that is the value-base. The idea is still free, but when ideas materialize in a digital way and leave their mechanical existence, the material relation to physical control over

what you consider as your property, is missing. When the idea loses its reference to the physical world, the value the usage brings once again becomes dominating for what we regard as legitimate and fair. The exchange value, coupled with exclusive intellectual property rights for the owner, cannot and should not be protected, since the idea behind the Internet is, according to Töllborg, at stake in the example of file-sharing. In this situation the former legal understanding of property rights will be invalid. Töllborg argues that you cannot claim ownership to something which is not possible to transform into something material, to a physical object. This will be the understanding of ownership, according to Töllborg, in the new hegemonic era[19]. The fact that there are a lot of people arguing for old solutions, does not change Töllborg's prediction. It is only a sign of the inevitable fight between different darling conceptions of your time, taking place when a society is in a phase of transition, and the idea of property in a digital context is part of the battle.

So, to finish the five examples of problematic darling conceptions in relation to digitalisation the three man combo is suddenly heard from the corner, singing something about a battle between the old and the new:

Can you feel it too?
The old world measuring the new
Can you feel it too?
The old world claiming the truth

I know you've heard it too
That the questions that we ask ourselves
in the passed way of thinking
won't solve the problems of the new

3.6.6 Conclusions: the battle of conceptions

There seems to be a battle not only over how to organize society but also about conceptions. The analogically based conceptions regarding the importance of the control over the reproduction of copies battles with the digitally based conceptions regarding flow of media where copies in themselves are not of the same importance. This leads to an interesting counter factual question that we can use to activate our minds. How would copyright laws have been designed had media distribution been digital from the beginning? That is, if we had skipped the step of

a demanding distribution and reproduction *via* plastic and physical artefacts, how would we have designed the legal setting that would ensure creativity in society?

This question aims at unlocking conceptions that are embedded in copyright legislation that may not be in accordance with the digital practice of today. There are parts of copyright legislation of today that probably would have survived and parts that would have looked different. If we at the same time look at the creators (and creativity stimulation) on one side and copyright as a market security for copyright holders on the other, we could nuance the discussion of copyright a bit. The much discussed protection of rights for seventy years after the creators' death is aiming at the copyright holders rather than at the creators and creativity stimulation.

Let me also address the scholars and the law-makers: legal science must understand how society changes. Otherwise, there is a high risk that the legal system could turn into an institution that uses its powers to support the parties that act and are coming from the traditional order in society, meaning an institution that distorts the societal development to fit some interests before others. And this is the consequence of that the legal regulations has first appeared in the same time as the old structures and parties emerged(mixed-up syntax). These ageing parties will receive support, not because they represent something more true or more just, but simply because they are the next to kin of the emperor, so to speak. The legal order then becomes a tool for power in a struggle between the old and the new, rather than a democratically legitimate interpreter of what is right and just.

In using the above mentioned work of Lakoff and Johnson on metaphors, applied on the grand context of this article, conceptions are unavoidably attached to discourses, and although they may have a very specific meaning in the discourse their meanings can change, and their uses can be altered. This implies that conceptions can be tied to an arranging order, an administrative pattern, in itself stemming from, for instance, analogue conditions of distributing media. These conceptions are likely to stand in the way when the administrative system is in need of a revision due to a change in the conditions. In short, the digitalization changes the conditions for distribution of media, and the conceptions tied to copyright are standing in the way of the needed revision of copyright legislation.

Let me get back to the initial quote from Lakoff and Johnson ("People in power get to impose their metaphors"[2]), and state that even though the research on metaphors of Lakoff and Johnson had nothing to do with law or regulatory language, the quote can be used in this context. Law relies on metaphors and

conceptions that have been discussed above, when it comes to copyright and the various legal constructions that for instance have been implemented within the European Union in order to enforce copyright more easily, these conceptions rely on a metaphorical use of the language that incorporates ideas of how the world is constructed as well as what the legal regulations should say. Those who control the laws and the legislative process can also, to a large extent, control what conceptions and metaphors should remain therein. This is why the battle of the Internet to a large extent has to do with controlling the conceptions that construct how we regulate the internet, and controlling those conceptions having to do with power.

When the idea of property rights are formed in an analogue reality and transferred to a digital, certain problems occur. An obvious problem, which has shown the two sides of viewing the handling of media content in the debate, is the sharing ideal of internet communication on one side and the "theft" on the other side. It is a battle of ideas, but also of conceptions of reality.

There is a risk that copyright goes from being a stimulator of creativity to a conservator of rights holders. It sort of implies that the most important media content is already created. "Now let's protect those who did it (or rather, hold the rights for those who did it)", which is a sad implication. It is conservative and will more likely stifle innovation, which is the direct opposite to the rhetoric that surrounds the law and its enforcement. This leads to an aim to control and to over-regulate protection of copyrighted content. It misses the point that *all* creativity is born out of a context, out of a culture, and that too much regulated protection will be *bad* for creativity[7].

The copyright regulation should not *primarily* be aimed at helping publishing houses, record companies or similar middle men to survive. They do not have a value in themselves for the copyright legislation to meet. Culture is however influenced by how the conditions are formulated. As technology has developed that has influenced storage of information, expanded duplication or distribution possibilities so have different opinions been heard. Some claim that the incentives to create disappear when the originators no longer have full control over the copies. Internet and file sharing however affects different types of creativity differently. The film industry may stand before a larger transition or challenge than the music industry, due to its larger and more expensive projects. However, in the changes of the premises for storage and distribution, and communication, one can estab-

[7] Even legal scholars have referred to this as *lex continui*. See [20]. See also the preparatory works for the Swedish Copyright Act, SOU 1956:25 s 66 f.

lish that some types of creativity will likely see harsher times, and other types of creativity will definitely thrive. It is a part of the change. Let us not forget that totally new forms also will emerge, many without retrieving any revenues from the existing copyright system whatsoever.

Is copyright strong or weak in these days of digitalization? And what will happen in the future? Lawrence Lessig, the Stanford Law professor and Creative Commons Licence promoter, paints a bleak picture of when it comes to the balance between content that should be accessible and that which should be protected. He sees a development towards an increase in protecting copyrighted material:

> "We are not entering a time when copyright is more threatened than it is in real space. We are instead entering a time when copyright is more effectively protected than at any time since Gutenberg. The power to regulate access to and use of copyrighted material is about to be perfected. ...in such an age, the real question for law is not, how can law aid in that protection? But rather, is the protection too great? .... But the lesson in the future will center not on copy-right but on copy-duty – the duty of owners of protected property to make that property accessible."[21].

An important question that lurks behind these disputes of ideals is what kind of protection can exist without an absurd amount of control over human actions? Communication technology is not just a bad habit of the young generation, it is a fundamental part of how this generation leads the life. In a study conducted in February 2009 by a Swedish research project called Cybernorms, with more than 1000 persons between 15 and 25 years old, the results clearly indicated that there existed no social norms that hinder illegal file sharing. And the surrounding persons of these youngsters imposed no moral or normative obstruction for the respondents' file sharing of copyrighted content[8]. In line with this the study also found that more than 60 per cent of the respondents rather paid for services that made them anonymous online and kept on illegally file sharing than paying for the content[9]. Many were however willing to pay for content, but not *via* the traditional model of paying for each piece. It was the flow that was of importance, for which

[8] I am part of this research group, tied to Lund University in Sweden. See http://ur1.ca/f6pe for a presentation in Swedish. See also the debate article from the research group published in Dagens Nyheter 23 February 2009 http://ur1.ca/f6pg

[9] http://ur1.ca/f6ph visited 14 June 2009.

the respondents were willing to pay, and in which the copyrighted content was included among other things.

When speaking of law and social norms one is often inclined to speak about the legitimacy of the legal regulations. The biggest threat to a law is losing its legitimacy. When a law is less right, it is no longer the trusted interpreter of what actions are right and wrong in terms of the social norms. One could claim that no law is stronger than the underlying social norms (which Håkan Hydén[22] does), and that the social norms are functions of the conditions for them. The conditions that are embedded as conceptions in copyright law have fundamentally, or even paradigmatically changed. The preconditions for the social norms have drastically changed as society has become digitalised. The social norms among many and the law do not match.

Law is strongly interconnected with society. Do not mistake behaviour in a society simply for a function of its laws, and that it therefore is easy to change society. This is where a problem lies, connected to legitimacy of legal regulations. The understanding of this article is that conceptions can be tied to a specific world order, to a way in which a society is organized. This leads to what the title is asserting: societies change and the conceptions that have been more or less deeply founded in them can face problems when translated into the new context. Clashes are inevitable. The rules and norms will collide and confuse. The example of file sharing, the Internet and the copyright debate has here been used to show the clashes of such a societal transition and the conceptions within.

Say it with a song

The song *The darling conceptions of your time* is a creative expression. It is also an experiment, an attempt to understand and to test a non-traditional model for content distribution and the functionality of the copyright regulation *via* the Creative Commons Licence. I am still the creator, but I make a contract with anyone who wants to do something with the song. It is a way to meet the new conditions for distribution and creativity. I am handing over the song to the commons to use, to re-mix, to share, or not. Democracy decides.

So, the changes and the embedded problems have to do with how we view society, what interpretations we make of the conditions it brings. It has never been as searchable and interconnected as it is today, bringing along a type of vulnerability and questions about how this interconnectedness is used.

And from the corner of the bar, when most guests have left, the three man combo still plays. One pictures the last drunken man at the very end of the bar, Galileo Galilei, who unsteadily rises to silence the imagined mumbling crowd around him with a movement of his hand. He looks a bit sadly towards them, and then starts to sing with a broken voice:

It's not the eyes that fool you
It's not the ears that can't hear
It's the darling conceptions of your time
that makes you feel this way
that makes you feel this way

Ville Sundell

4

A utilization of Jabber Instant Messaging

4.1 Introduction

I here pass on a message about open and free protocols and server-side freedom, especially focussing upon instant messaging. The point of this article is to help users utilize *Jabber/XMPP* – the free and open instant messaging protocol suite, and free software implementations of it.

Alongside an analysis of open and proprietary services, this paper is also meant to be an easy guide to Jabber, which a system administrator could hand to users.

4.2 A brief history of personal Internet Instant Messaging

The invention which is said to start the era of Internet instant messaging was *IRC*, originally an ASCII-based protocol and server software, initially developed by Finnish student Jarkko Oikarinen in 1988.

When a user connect to an IRC network (which consists of one or more server machines), the user is using only that particular network and the chat rooms and users are available only in that network. So, if a user wants to chat in a room which is not in the current network or wants to talk to friends not available in the current

network, another connection has to be created to *another* network (which is like a completely different universe with different services and different users).

As time passed by the problems of centralized IM services became more visible, eventually in 1998 spawning Jabber, the decentralized and open XML-based protocol. The centralized model was very convenient for big companies like AOL, Yahoo and Microsoft, because now they could provide free IM services for users of their other services (Email, Software suite, etc.). For these companies, it was very convenient to get people to use only one network, one protocol and one client. With this model, they got more users for their other software and increased their market share, and got income mostly from selling advertisements which would be shown in the client program.

So, combining instant messaging with other software, those large vendors were able to get a really strong and profitable position in the field of personal IM. The model worked well for several years for both customers and vendors. However, now, after year 2000, mostly because of a larger user base, the problems which computer-oriented people had seen for a decade with this model, started to show up for normal users...

4.3 Problems with centralized and non-free solutions

It seems, that now, from the end users' point of view, the current non-free instant messaging protocols and implementations, like *MSN* or *AOL* are working fine: users can connect with a wide variety of different clients. They can message their friends, and everything just works. However, the first signs of a collapse of proprietary IM systems were evident during the last few years: client's advertisements becoming more and more visible, censorship and manipulation of user's messages, increased downtime, and sudden protocol changes are disturbing the communications of the end user.

Usually, in normal and healthy customer-vendor relationship, the customer is free to change the vendor if that vendor is not delivering the goods the customer ordered, or the vendor is having bad problems when delivering them. This fair competition setup should help vendors automatically improve the quality of services. Well, that is how it should work in the perfect world. However, the situation we are talking about here is called "vendor lock-in", a situation where the customer (here a customer is the user of the IM service) is "locked", to a certain vendor (here,

a vendor is a provider of an IM service), without the possibility of changing the vendor itself.

In IM world, this “lock-in” is archived by a very familiar factor: the users! Usually, the biggest reason for people not wanting to change the vendor is that the people they want to be in contact with are using the same service, but are not available in the service you would like to use. So, because everyone uses their own protocol, users from MSN can’t communicate with users using Yahoo’s services. And, as we know, communicating with other people is the main purpose of IM, right?

So, we are in a situation where the technical features of the protocol, quality of client software, features of the network and small downtime, are not good enough reasons to change, in the end-users’ point of view. This might lead us to think, if users are happy and can live with these problems, is the change really worth it?

4.4 Dangers of proprietary IM services

Although the problems mentioned above do not seem to be critical enough to force the change of an IM service provider, that is only because we do not seem to see yet where this road is leading us.

In our present time, we can already see some of the problems. Next, let’s discuss what those are, how we can see them, and where all this is leading in the near future.

4.4.1 Censorship and message manipulation

In the beginning of August 2007, a bunch of people started to track a problem with MSN, which seemed like a server error: some messages didn’t get through. However, it was noted that those messages which didn’t get through had some URLs in them. More precisely, every message which had some URLs using a top level domain “.info” *(e.g. “http://www.example.info”)*, got automatically blocked. The news started to spread in the Internet, and people looked for more keywords which would be also blocked.

It turned out that there were plenty of them, all involving URLs somehow. The official response from Microsoft was that the URL blocking was part of their anti-virus war, and it was needed for that reason. And, all of this, is legal (because usually a service provider can decide, what to pass and what not to). At the time of writing, it seems that you can send normal “.info” URLs, but still the service

seems to block messages like *"http://www.example.info/download.php"* (*"download.php"* is also one of the magic keywords).

AOL and *ICQ* are also blocking certain messages, but in their services usually only HTML-tags which can be used for inserting scripts in the clients' end are blocked.

Because the blocking is at the server-side, there is nothing we can do in the user side (except use a service like Tinyurl[1], but that is not really solving the problem, it just rounds it). Because the servers are operated by one entity, it can freely decide what kind of messages it wants to forward to the users. So in this situation, switching to an alternative client is not helping us. However, in the next situation, it does help.

4.4.2 Advertisements

As probably every user of large IM services knows already, the official clients (like MSN Messenger and Yahoo! Messenger) are nowadays fully loaded with all kinds of advertisements, which can be based on text, still or animated images, and even audio.

But, unlike the previous problem, this can be rounded (so far), by switching to alternative clients, which usually are free and open source (e.g. *Pidgin*[2]), but that will lead us to the other problem, which we discuss next.

4.4.3 Protocol changes

Sometimes it can happen that a service provider suddenly changes the networking protocol, so that current alternative clients are not able to connect to the network any more without modifications to the client code. With MSN this happened in 2008, when it suddenly leapt to a new protocol version. This led to a situation where the current alternative clients didn't work any more, and needed an update from the vendor.

4.4.4 Downtime

With centralized solutions, the downtimes are a big problem for the quality of the service because, if the centralized servers go down (suffering from bugs, security

[1] http://ur1.ca/f6pa
[2] http://ur1.ca/f6pc

holes, high network load or broken connections), there is, of course no way to use the service.

4.4.5 Diversity

Usually, in software development, diversity is sometimes considered a good factor which breeds new innovations. But when this concept is applied to networking protocols, the result is a mess. As we know, there is no way to connect AOL users directly from an MSN network. In small countries, where one protocol acts as the major protocol (usually, one country has one dominating protocol, but the protocol changes from country to country), the diversity is not a very visible problem. But when trying to contact friends from another country, that may require using a different service.

4.4.6 Seeing beyond the IM

One thing which proprietary IM services seem to miss, is thinking of the communication beyond normal text/voice/video messaging. Usually, because of restricted design, this is not possible to implement easily.

With free and open protocols (like Jabber/XMPP), users can use the basic protocol to transmit their own data; for example, for your own application.

There are already tons of extensions for the basic XMPP protocol, but there are more and more coming all the time. For example the upcoming *Google Wave* will be based on XMPP (which is not only about instant messaging).

4.5 So, what is this Jabber?

The answer is simple: the solution. Basically Jabber is a free decentralized solution for communication between two or more users. There are no central servers, rather there are many providers of the service. These providers communicate between their users and other Jabber providers. Becoming a provider is easy, you just need a machine to run some Jabber server (which we will discuss later). Becoming a user of Jabber is way more easy, you need just a client, and a server to connect. We will discuss it in the next chapter.

In a technical point of view, Jabber is a combination of XML-based XMPP-base protocol and extensions to that protocol (called XEPS, also based on XML).

The XMPP protocol can handle most basic tasks, like authentication, encryption, sending and receiving data to different users, and server-to-server connections. Both XMPP and XEPs are managed by the XMPP Standards Foundation (XSF), but users are still free to create their own extensions to the protocol.

Most important XEPs include:

- MUC – multi user chats (“chatrooms”)
- User profiles
- XHTML messages

Now you know the basics about Jabber and XMPP, so let’s start using Jabber, learning more about Jabber as we advance.

4.6 Using Jabber

4.6.1 The First step – becoming a “Jabberist”

The only thing you really need is a client. Here is listed a few good free-software clients:

- Pidgin (it can handle many protocols, like MSN and IRC, in addition to XMPP/Jabber, multiplatform)
- Psi (Only Jabber)
- Miranda (Windows only)

After you have selected the client (I use Pidgin, it also comes pre-installed in Ubuntu and other modern free-software-based operating systems), and installed it, now it is time to fire it up, and create a new account.

Here we are working with Pidgin, but the same fields mostly exist in other clients.

First, when you start up Pidgin, you will see this:

You will see the dialogue pictured here only at first startup, when there are no other

accounts. Here, just hit “Add” to see next dialogue, and add the first account.

Just fill the dialogue in as it is shown. You usually don’t need to care about the options of the Advanced-tab, usually they are right. But if you are experiencing some network problems, you should check that tab also. The only things which vary here are your “Username” and “Password” fields. Change these according to your wishes, otherwise everything should be alright.

“Domain” is the server, where do you want to save your account, jabber.org is general server, which is open for everyone.

“Resource” is free-form string, which tells the location where you are connecting.

If you are the only person using this account, it is safe to check the “Remember password” box.

Check also the last box, to be able to register your account, if you are creating a new account (if this is your first time, you are creating a new account, so you can check this box). Otherwise, if you know your account exists on the server already, and you are just connecting to that account normally, do not check this box.

Next, after clicking the “Save” button, you will need to wait a bit, and you should see this kind of dialogue:

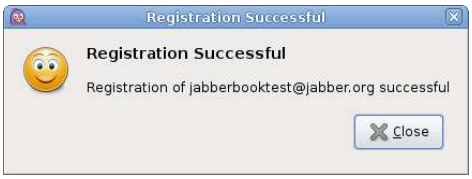
This means, that the server is using a so-called self signed certificate. If you want, you can view detailed information about the certificate by clicking the “View Certificate…” button. The checksum of the certificate should be **e8:b8:c4:f2:41:5f:fb:64:9f:5d:be:52:1c:da:8f:a6:a4:fc:33:6e**, this will expire Thu Dec 17 19:56:18 2009, so after that, the checksum is going to change. But in

most cases, the certificate should be fine, so you can just click “Accept”. After this initial acceptance, in future, if your client complains about the certificate not being valid, you have to take that seriously, because it can be that you are under a DNS spoofing attack.

Anyway, presuming that noone is going to attack you, and that the sky is not falling on your head, press “Accept”, and fill up this dialogue:

This is now a confirmation about the account you are going to create to the server. This is exactly the same information you gave in the “Add Account” dialog above, so you can just hit “Register”, and move to the next dialogue.

If registration is not successful, check the information you gave to Pidgin, it is possible that there is already someone using the username you wanted. In this case, you have to select another username. After a successful registration you should see a dialogue like this:

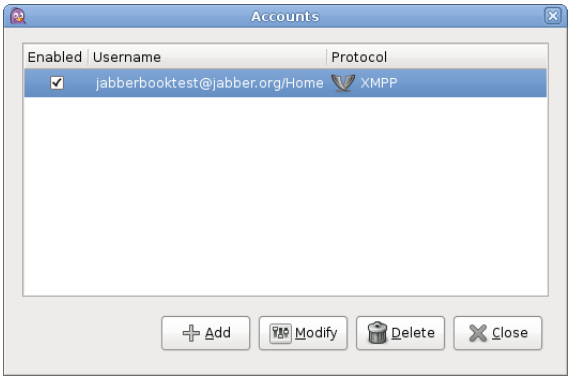


Congratulations, now you have your first Jabber account!

There is just one more step, in the following dialogue, check the “Enabled” box for your account like this:

And the Pidgin connects to the server!

4.6.2 More advanced use of Jabber: Sending messages



You can now send messages to individual people just by clicking the “Buddies” menu at the top of the “Buddy List” window and select “New instant message”. After that, if you have many accounts connected, select the right account from the popup menu, and then just write the Jabber ID *(JID)* of the per-

son you want to message with. When pressing OK, new window (or if you already have an IM window, it will create a new tab), and there you can send messages to the person.

4.7 End words

I hope that from this article users have been able to see the basic need for free and open, decentralized instant messaging solutions, and become familiar with the basics of Jabber/XMPP.

Henrik Moltke

5

RMS on FREE BEER

Transcribed by Gunhild Andersen

HM: Hello, my name is Henrik. I'm calling on behalf of Superflex . . .

RMS: Sorry, you said super-what?

HM: Superflex.

RMS: I don't recall that name.

HM: Do you remember the Free Beer?

RMS: Yes!

HM: What we hoped to do with you was to ask you to taste and review the beer, which is . . .

RMS: It wouldn't work, because I don't like beer. I also don't like the emphasis that most people put on getting drunk. I have only got drunk once in my life, on

a transatlantic flight. I had made the mistake of putting my sleeping pills into my suitcase which I'd checked. I tried using whiskey to achieve the same effect. It didn't work very well, partly because it was so disgusting I could hardly swallow it.

HM: Did you manage to sleep in the end?

RMS: I slept a little bit.

HM: But I was thinking that maybe we could try and do something remotely similar to a review, just without actually talking about the taste and the hue and the . . .

RMS: OK!

HM: So if you could pretend that you were reviewing this idea of a free beer . . .

RMS: Oh, I love the idea as long as I don't have to drink it!

HM: I was wondering about the name, because most people will think about this only as free beer in the free beer sense . . .

RMS: . . . Well,

HM: . . . but there is another . . .

RMS: . . . are you selling samples of it?

HM: Well, actually we do sell free beer in a shop, but we also . . .

RMS: Yeah, I hope so! It probably costs you money to produce a batch.

HM: Exactly.

RMS: So it makes sense to sell bottles of it, or glasses of it. And so that will make people think: they'll see this is free in the sense of freedom, but it's not gratis.

HM: Exactly, that was the concept from day one . . .

RMS: Mmm?

HM: So, do you have anything against or for naming a beer Free Beer?

RMS: I like the idea, because it's a cute way of making a point.

HM: And could it be called a hack in the sense of . . .

RMS: Yes! Yes, it is a hack. Playful cleverness is hacking, so this is hacking.

HM: I remember that we received an email with some very constructive comments about intellectual property and the way we use . . .

RMS: Well, actually, my comments may have been about quote "intellectual property" . . .

HM: Exactly.

RMS: . . . unquote, because I never talk about - I never use that term . . .

HM: And that's what you were telling us.

RMS: . . . to describe anything, and it's a mistake to do so because that term mixes together various different laws with totally different effects as if they were a single thing. So anyone who tries to think about the supposed quote "issue of intellectual property" unquote is already so badly confused that he can't think clearly about it.

HM: Now, in the same email you also suggested that we call the beer a free software beer instead of an open source beer.

RMS: Yes. I founded the Free Software movement, and “open source” is a term used to co-opt our work; to separate our work from our ideals that motivated it. See, we developed software that users are free to run and share and change as they wish, for the sake of freedom. Because those freedoms, we believe, are essential. Then there were millions of people who appreciated the software and appreciated being able to share and change it, and found that it was very good software too. But they didn’t want to present this as an ethical issue. So they started using a different term, open source, as a way to describe the same software without ever bringing it up as an ethical issue: as a matter of freedoms that people are entitled to. Well, they’re entitled to their opinions. But I don’t share their opinions, and I hope you don’t either. So to support awareness of the ethical issues of free software the most basic thing to do is talk about free software.

HM: Do you think this will come about by discussing for example a beer that actually isn’t software?

RMS: It’s a similar kind of issue arising here. A beer doesn’t actually have source code either. A recipe is not like source code, you can’t just compile it. There’s no program that turns the recipe into food.

HM: What if we speak about the general idea of taking ideas from the free software movement, and from the open source movement even, and transferring those values onto something which is not software?

RMS: I’m all in favour of it. Whenever they’re applicable. When these ideas make sense in one context they may make sense in another context, but that’s not guaranteed. They’re not applicable to everything in life, they’re applicable to certain things. Specifically, they’re applicable when there are works made of information that are useful.

HM: So where do you draw the line? Does an open source cook book make more sense than an open source car?

RMS: I’d rather not use the term open source. I’m not a supporter of the open source movement.

HM: I'm sorry. That's the problem: if . . .

RMS: Recipes should be free.

HM: But I was thinking, is there a way that we could use this word in a better way than speaking about an open source beer? Because a free software beer also sounds strange.

RMS: Yes, they both are strange. Neither one really fits because a beer is not software and has no source. So if you're going to strain things to refer to a movement, you might as well pick the movement you support.

HM: Because we've taken a bit from one and a bit from the other.

RMS: Anyway.

HM: We tried to recount the whole story of what happened in the early seventies up till now to sort of explain what the idea of the beer was, and I find this quite complex.

RMS: It is!

HM: Is there any way that these kinds of ideas could travel to the minds of people in an easier way?

RMS: Well, I find that recipes make a good analogy for explaining the ideas of free software to people. Because people who cook commonly share recipes and commonly change recipes, and they take for granted that they're free to cook recipes when they wish. So imagine if the Government took away those freedoms; if they said "starting today, if you copy and share, or if you change a recipe, we'll call you a pirate." Imagine how angry they would be. Well that anger, that exact anger, is what I felt when they said I couldn't change and share software any more. And I said "No way, I refuse to accept that."

HM: Why do you think this had to happen within software and computers, why haven't people demanded the same kind of freedoms before?

RMS: Well, there weren't enough people using computers, and in the early days software was free, actually.

HM: Yeah. When you started . . .

RMS: It was in the seventies that software became proprietary. And that change for the worse was complete by the early eighties. But I had had the experience of participating in a community of programmers where sharing software was normal. And when it disappeared and died, and I saw a morally ugly way of life as my probable future I rejected that.

HM: That was back in the beginning of the eighties?

RMS: That was in 1983. I formed the Free Software Movement and launched a plan to develop a free software operating system so that we could use computers and have this freedom.

HM: Do you think that the way that things are now and the way that you have a GNU/Linux option or you can do many things with different kinds of open source software . . .

RMS: Please?

HM: I'm sorry, I'm sorry.

RMS: I don't want you to use the term open source.

HM: I'm very sorry.

RMS: It's not what I stand for. You're putting me in a very bad position by talking with me about my work and using the term, the name of a party that was formed to reject my views.

HM: This is something very difficult for someone like me to actually - because I am not a computer programmer. I am not somebody who has lived this for 20 years. So for me it is difficult although I'm trying to . . .

RMS: Think of open source and free software as the name of two different political parties . . .

HM: I fully understand that.

RMS: . . . with different programmes. If you invited the leader from the Green party - which, by the way, I more or less support - and you started talking to him about his work in the Conservative party, and you did that several times, he'd probably get mad at you.

HM: And I could imagine that this is something that happens often with the political press and journalists and . . .

RMS: Yes. Yes it does, and in fact before I give an interview I raise this issue and I make sure that they've agreed not to do this. Because it would be pointless to do an interview if I'd be misreported as a supporter of open source.

HM: Well, you know, I actually did my homework, and this is something that I find must be as difficult for ordinary people . . .

RMS: It's not that difficult. You're talking about changing a habit. It takes a little bit of work and you make mistakes a few times but don't exaggerate it. You can change a habit.

HM: When you started the Free Software Movement and the GNU project, would you ever have imagined that this kind of idea would turn into something outside of the computer world, something like a beer or . . .

RMS: No, I didn't think for a minute about that.

HM: When did that start happening, when did you start seeing those possibilities?

RMS: About five years ago.

HM: Is that what you hope will happen in the future from now on?

RMS: Well, I hope so. But mainly what I'm hoping for and working for is that software should be free.

HM: And do you think a project like this will help?

RMS: Yes. It'll help. It will bring the ideas home to people who wouldn't have thought about them otherwise. And that's useful.

HM: I hope this will get some repercussions and that we may use this . . .

RMS: Happy hacking!

HM: And thanks very much for your time!

RMS: Bye.

HM: OK, bye bye.

Intermission

Jeremiah Foster

6

Creating Debian packages from CPAN

CPAN is a well-known and useful archive of Perl modules, a pearl in the Perl world. While it serves many Perl developers and users, it cannot by its very nature cater for further distribution because it does not know what form that distribution has to take. In other words, how is cpan supposed to know if it needs to morph into a specific format to allow a module to be installed on a specific platform? It cannot and should not, it should provide instead a stable API and a distributed database allowing for easy packaging “downstream”, which is what it does. One can install from source if one prefers, or with the cpan and cpanp tools, but sometimes you need or want a more complete and flexible system for installing software.

As we move downstream, we get closer to the user and the user’s system. Hic sunt dracones, you need to be pretty careful about how and what you install lest you create instability and bugs. Cpan tries to handle installation elegantly by installing dependencies with whatever module you are installing. This is a “Good Thing™”, it helps the end-user immeasurably and helps to avoid “dependency hell”; a painful state which describes the situation of having some of your needed software installed, but not all of it.

Since a cpan module is agnostic to its final destination and tries to be as cross-platform as possible, it will not know about the specific peculiarities of the operat-

ing system upon which it is to reside. In fact, one might argue a good deal of cpants is directed at this problem, determining the quirks of the OS. Workarounds include the inclusion of multiple operating-system-specific tools and functions, yuck.

A better solution might be “package management” which allows for a cpan module to be wrapped in a way that allows for simpler installation. This is of course operating system specific and rightly so, the OS needs to determine how to install, where to install, and what. So cpan can just do its thing while the OS communicates directly with cpan, gets the required module(s), any Perl dependencies, and does the installation work. The OS then checks to see if there are operating system required dependencies above and beyond the Perl dependencies, satisfies those dependencies, resulting in a single call to the package manager to install software without having to search the internet for some arbitrary .so file.

This article aims to explain this packaging process for Debian and Debian derived operating systems such as Ubuntu, allowing for Perl modules to be installed as debs and even submitted to Debian itself. The Debian system has many users, receives security notifications, is known for its stability, and gets regular updates. These are things your Perl modules will automatically get as well when you submit them to Debian.

There is a dedicated group of Debian hackers, both “Debian Developers” and non-developers, who maintain Perl modules in Debian. I am one of those who works on the Debian-Perl team[23] and would like to describe the development of debs from cpan, including some of its gory details, so that others can be familiar with “best practices” of packaging software for Debian.

Let us begin with a tool called dh-make-perl, shall we? Dh-make-perl (the dh stands for Debian helper) is a wrapper around the cpan tool, plus a whole lot more. We call it the same way as we would call cpan, with a module name. It then goes to cpan for the source of our deb because the goal of a deb is to have the source code separate and pristine. Debian makes no changes to the upstream source for packaging. Occasionally someone in Debian might patch the source to fix a bug, but in Debian-Perl we try to use patch to patch things and always try to pass our patch upstream at least into RT, Perl’s bug tracker.

Choosing something to package is actually quite important. I will choose Test::File because I find it useful and have some familiarity with it - two things one needs to generate the interest and motivation when there are bug reports or new features. Packaging is actually considerable work over time, a stale package is both a potential security risk and quickly forgotten.

Now we use our first tool, the powerful dh-make-perl. I will show the call to dh-make-perl and then go through it a bit since I am going to pass a lot of arguments just to show some features.

Listing 6.1: dh-make-perl command

```
dh-make-perl --cpan Test::File --desc "Test file attributes
    with perl." --arch all --version 1.25 -e
    jeremiah@jeremiahfoster.com --dh 7 --requiredeps --build
```

We call dh-make-perl with a bunch of parameters. This of course is not necessary, you can make your call much smaller, but I want to show some of these parameters because they make life a little easier and you may want to use them. Of course the canonical source of dh-make-perl parameters and functions is in the man page for dh-make-perl, this is good to check on occasion since it has been getting updated recently[24].

The first parameter, or really argument to dh-make-perl, is the --cpan flag which tells dh-make-perl to go and get the module from cpan as opposed to finding it locally. From the man page: “If neither --cpan nor a directory is given as argument, dh-make-perl tries to create a Perl package from the data in .” i.e. the current directory. So if you have a module you want to install locally or for some reason do not want to push up to Debian, you can create local debs for your own local machines or mirror, no need to push them downstream as it were.

Next we give the name of our module in the same way we would if we were using cpan, i.e. Foo::Bar. The --desc switch tells dh-make-perl what to use for Debian’s short description and the --arch flag is for the architecture. Here we are using all because perl works on all the architectures that Debian officially (and unofficially) supports.

Shockingly enough the --version flag provides a way to inform dh-make-perl about the version of the package we are packaging, so this is the current version of Test::File; -e is the email address flag, it wants an email address after it; --dh is a call to debhelper itself and after --dh you have to specify the version of debhelper you want to use. This is a little tricky because different versions of debhelper create different artefacts, specifically different debian/rules files. So you want most likely to use version 7 for debhelper. To paraphrase the dh-make-perl man page, --dh will set desired the debhelper version. If “ver” is 7, the generated debian/rules file is minimalist, using the auto-mode of debhelper. This minimalist version is what you want, unless you are going to package an XS module or need to do some crazy stuff at build time.

Fortunately we do not have to mess about with our debian/rules file, so I am going to continue discussing the rest of the arguments to dh-make-perl, but I want to say that there is a great deal to discuss regarding debian/rules and you would do well to consider reading about it in the Debian developers' documentation in places like the New Maintainer's Guide[25]. If you are reading this in front of a Debian command line, you can simply do an "aptitude install maint-guide" to get the documentation.

The --requiredeps flag tells dh-make-perl to require Perl dependencies, that is to say, if we do not find all the modules needed to build, we should fail to build our deb. This is really good because it makes your deb package more portable and all the Perl module dependencies will get installed when you install your package on another machine, very convenient. For this call to work you need to have apt-file installed on the machine on which you are building the package. Apt-file is an excellent tool, written in Perl (of course!). It allows you to search for files in Debian packages, even packages that are not installed on your system. This means that apt-file is really the canonical tool to find things in Debian or Ubuntu packages. A quick example: say we wanted to install libtest-more-perl and we called aptitude to install it thusly, "aptitude install libtest-more-perl". Aptitude says:

Listing 6.2: aptitude install libtest-more-perl output

```
E: Unable to locate package libtest-more-perl
```

But we are certain that this fundamental perl module is in Debian! Haven't we seen Test::More output in fact? Indeed we have, but this module does not exist on its own. Debian has included it with the package perl-modules because it is such a fundamental tool, and so much else in Debian requires it. So looking for it with "dpkg -L libtest-more-perl" will produce these rather unhelpful results:

Listing 6.3: dpkg -L libtest-more-perl output

```
Package ‘‘libtest-more-perl’’ is not installed.
```

But in fact, when we search with "apt-file search Test/More.pm" (which is the format we need to specify since we are looking at the file system) we will find that apt-file finds it for us:

Listing 6.4: apt-file search Test/More.pm output

```
perl-modules: /usr/share/perl/5.10.0/Test/More.pm
```

This output tells us that the file Test/More.pm is under /usr/share/perl/5.10.0 and it is in the Debian package perl-modules. This is a handy and reliable way to find if the Perl module you are looking for is already packaged in Debian. All of these commands were issued on a Debian testing system.

Finally we pass --build which "builds only a binary package (by calling 'fakeroot debian/rules binary') and does not sign the package. It is meant for a quick local install of a package, not for creating a package ready for submission to the Debian archive." So says the man page for dh-make-perl. I like to build the package with dh-make-perl because then certain build problems come to the fore sooner. It is not a requirement to build the package with dh-make-perl however.

Once we have run dh-make-perl, we watch all sorts of interesting output fly by, like output from cpan, the test suite of our module, etc. The debhelper build process takes over after cpan has worked its magic and we get a finished two files and a directory when we are done. They are:

Listing 6.5: dh-make-perl output

```
File: libtest-file-perl_1.25_all.deb
File: libtest-file-perl_1.25.orig.tar.gz
Dir: Test-File-1.25
```

6.1 The anatomy of a package

You would be tempted to say "Well I have built my deb, I'm done!" Doing a dpkg --contents libtest-file-perl_1.25_all.deb ought to show this output on our new deb:

Listing 6.6: dpkg --contents libtest-file-perl output

```
drwxr-xr-x root/root         0 2009-02-09 15:39 ./
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/man
    /
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/man
    /man3/
-rw-r--r-- root/root      4142 2009-02-09 15:39 ./usr/share/man
    /man3/Test::File.3.gz
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/
    perl5/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/
    perl5/Test/
```

```
-rw-r--r-- root/root     27027 2008-06-10 19:59 ./usr/share/
    perl5/Test/File.pm
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/doc
    /
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/doc
    /libtest-file-perl/
-rw-r--r-- root/root        69 2007-02-09 02:30 ./usr/share/doc
    /libtest-file-perl/README
-rw-r--r-- root/root      1476 2009-02-09 15:39 ./usr/share/doc
    /libtest-file-perl/copyright
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/share/doc
    /libtest-file-perl/examples/
-rw-r--r-- root/root        69 2007-02-09 02:30 ./usr/share/doc
    /libtest-file-perl/examples/README
-rw-r--r-- root/root       164 2009-02-09 15:39 ./usr/share/doc
    /libtest-file-perl/changelog.gz
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl5
    /
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl5
    /auto/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl5
    /auto/Test/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl5
    /auto/Test/File/
-rw-r--r-- root/root       195 2009-02-09 15:39 ./usr/lib/perl5
    /auto/Test/File/.packlist
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl/
drwxr-xr-x root/root         0 2009-02-09 15:39 ./usr/lib/perl
    /5.10/
-rw-r--r-- root/root       214 2009-02-09 15:39 ./usr/lib/perl
    /5.10/perllocal.pod
```

But in fact we are not done, we need to build the deb with dpkg-buildpackage and we need to modify some of the files in the Debian directory. First we will start by modifying the files in the Debian directory to make sure we have a proper package. The first thing we need to do is to change the name of our directory. Debian has a requirement that says the package name has to be lowercase which means that our directory has to be lower case. So we move Test-File to libtest-file-perl-1.25. This format is the standard format for Debian Perl packages. While one might say it is not the most beautiful format, it has its strengths. Those strengths are that the format informs the user it is a library package, part of a larger system

which might require dependencies. It has the suffix -perl which indicates that it is a Perl library. There are a few modules in Debian which are not labelled this way, and there is no absolute law saying you have to call your module this way, but if you do not you are in fact doing the user a grave disservice, because anyone who is used to Debian or Debian derivatives will search for a module as libfoo-bar-perl and they will not find your module if it is not so labelled.

So once we have moved Test-File-1.25 to libtest-file-perl-1.25 we will change into that directory and take a look around. We find that it is just like the untarred module from CPAN only with the addition of a Debian directory. We will take a closer look at the Debian directory now which is at the heart of packaging. According to the New Maintainer's guide[26] "The most important of them are 'control', 'changelog', 'copyright' and 'rules', which are required for all packages." Let us start by taking a look at the control file:

Listing 6.7: control

```
1  Source: libtest-file-perl
2  Section: perl
3  Priority: optional
4  Build-Depends: debhelper (>= 7)
5  Build-Depends-Indep: perl (>= 5.6.0-12), libtest-manifest-perl
       (>= 1.14)
6  Maintainer: Debian Perl Group <pkg-perl-maintainers@lists.
       alioth.debian.org>
7  Uploaders: Jeremiah C. Foster <jeremiah@jeremiahfoster.com>
8  Standards-Version: 3.8.0
9  Homepage: http://search.cpan.org/dist/Test-File/
10 Vcs-Svn: svn://svn.debian.org/pkg-perl/trunk/libtest-file-perl/
11 Vcs-Browser: http://svn.debian.org/viewsvn/pkg-perl/trunk/
       libtest-file-perl/
12
13 Package: libtest-file-perl
14 Architecture: all
15 Depends: ${perl:Depends}, ${misc:Depends}, libtest-manifest-
       perl (>= 1.14)
16 Description: Test file attributes with Perl.
17  Test::Files provides a collection of test utilities for file
        attributes.
18  .
19  Some file attributes depend on the owner of the process
        testing the file in
20  the same way the file test operators do. For instance, root (
        or super-user or
```

```
21  Administrator) may always be able to read files no matter the
        permissions.
22  .
23  Some attributes don't make sense outside of Unix, either, so
        some tests
24  automatically skip if they think they won't work on the
        platform. If you have
25  a way to make these functions work on Windows, for instance,
        please send me a
26  patch. :)
27  .
28  This description was "automagically" extracted from the module
         by dh-make-perl.
```

I will move quickly through the first lines of the control file but I would like to point out lines 4 and 5 where Build-Depends and Build-Depends-Indep are defined. This is where the magic at the core of aptitude lies, and why the apt system is so powerful. Here we define the relationships between packages in the operating system and within Perl which will be satisfied at build time. These dependencies were calculated by dh-make-perl but there are other mechanisms to do this as well and sometimes we will even need to do this by hand. Looking in the source directory for the package and even the META.yml and Makefile.PL can reveal dependencies that might otherwise be missed. Usually dh-make-perl gets it right however and this is not necessary.

In our Build-Depends line we are saying we depend on debhelper and we will not be able to build our package unless this dependency is satisfied, it is an absolute dependency. The apt system will check automatically for dependencies on your dependencies, so you only specify the dependencies you need for your package, you do not have to rummage around to find out what they depend on. Build-Depends is only for dependencies required to build a binary package on your architecture, it is not a complete selection of build-time relationships. In our package, we also need Build-Depends-Indep which defines other packages that our package will need to run, not just to build.

This is fairly esoteric stuff, and Perl largely abstracts the "building" of binaries away from the Perl programmer in the interest of simplicity and ease of use. You can dig into this stuff if you want, there is much more to learn about building Perl both on the Perl side and on the Debian side, but since it is a rather large subject area I am going to gloss over the really hairy details and refer you to the

Debian policy[27] and your own Google prowess to get more info than that I have presented here.

Most of the other stuff in the debian/control file is pretty self-explanatory; resources for the source code, who was responsible for the package uploading, etc. I would like to direct you to the last line where we see some packaging boilerplate which ought to be removed, i.e. line 28.

If we now turn our attention to debian/copyright we can see the power of Free Software and copyright. The Debian Free Software Guidelines require that a copyright be assigned so that a licence can be enforced. Perl is under the Artistic licence, a licence that has won important legal victories in the United States, and also under the GPL. This dual licensing is effective but only when there is a copyright specified and many Perl hackers forget to do this. I would like to encourage you to document your copyright, even if you received the copyright by default when you authored new code, this makes it easier to package your software. Here is what our copyright file looks like:

Listing 6.8: copyright

```
1  Format-Specification:
2      http://wiki.debian.org/Proposals/CopyrightFormat?action=
           recall&rev=196
3  Upstream-Maintainer: brian d foy <bdfoy@cpan.org>
4  Upstream-Source: http://search.cpan.org/dist/Test-File/
5  Upstream-Name: Test-File
6  Disclaimer: This copyright info was automatically extracted
7      from the Perl module. It may not be accurate, so you better
8      check the module sources in order to ensure the module for
           its
9      inclusion in Debian or for general legal information.
           Please,
10     if licensing information is incorrectly generated, file a
           bug
11     on dh-make-perl.
12
13 Files: *
14 Copyright: brian d foy <bdfoy@cpan.org>
15 License-Alias: Perl
16 License: Artistic | GPL-1+
17
18 Filend: debian/*
19 Copyright: 2009, Jeremiah C. Foster <jeremiah@jeremiahfoster.
       com>
```

```
20 Licence: Artistic | GPL-1+
21
22 Licence: Artistic
23     This program is free software; you can redistribute it and/
           or modify
24     it under the terms of the Artistic Licence, which comes
           with Perl.
25     On Debian GNU/Linux systems, the complete text of the
           Artistic Licence
26     can be found in '/usr/share/common-licences/Artistic'
27
28 Licence: GPL-1+
29     This program is free software; you can redistribute it and/
           or modify
30     it under the terms of the GNU General Public Licence as
           published by
31     the Free Software Foundation; either version 1, or (at your
            option)
32     any later version.
33     On Debian GNU/Linux systems, the complete text of the GNU
           General
34     Public Licence can be found in '/usr/share/common-licences/
           GPL'
```

This file is pretty straight-forward. We will remove the boilerplate from lines 6 through 11 and then fill in the exact date of the copyright for the software, in this case we'll have to go to cpan and find out that it is 2008, but after that we are done with the copyright file.

The compat and watch files play minor roles in our package building drama. The watch file is a tool to check to see if there have been any new releases, it gets used by a tool called uscan which allows one to update a new cpan module into an existing Debian package quickly. The compat file is merely a "compatibility" number for some of the other Debian tools, I will leave that to you to explore.

6.2 Building the package with dpkg-buildpackage

Now it is time to look at the main build tool for building Perl debs, dpkg-buildpackage. There are plenty of build tools in Debian and there seems to be a new one every month. For example there is now one called git-buildpackage and for all I know it may be great. I like dpkg-buildpackage so that is what I am going to tell you about.

As with every build tool there are ten thousand options, but I am just going to describe the juicy parts. I call dpkg-buildpackage like this:

Listing 6.9: dpkg-buildpackage command

```
dpkg-buildpackage -rfakeroot -D -kjeremiah@jeremiahfoster.com
```

What we have right after the call is the flag -r with the word fakeroot right after it, that is the command used to gain root. The -D is for checking conflicts and dependencies which I highly recommend although you can do it without checking dependencies but that would most likely not be portable. Finally, -k and my email address is the key I use to sign the package.

This tool is a Perl tool, of course, and if you look at the source you will see the name Ian Jackson in the copyright section. Ian Jackson is the guy who started Debian, he is in fact the Ian of Debian with his wife Debra being the deb part. You can also see that this file is not very well documented, no pod for example, which is a shame. There are other modules also being pulled into this one, modules like dpkg and dpkg::Version which is useful for checking version numbers of packages. Why won't you find these packages on cpan? Good question. It is one of my long term goals to expose all these tools to cpan and get the public to examine them and help with development and documentation. The developers in Debian seem to think these tools are only relatively interesting to a Debian developer, which may be true, but I suspect it is valuable to have tools that work on such a fundamental level with Debian packages since Debian is so widespread. Then people can either use them themselves or even devise tools on top of them that might be useful, like the cpan2dist tool in cpanplus. I can also see these tools as potentially being useful for a distribution agnostic linux packaging program. In any case, I think Debian should follow the best practices of the Perl community either way and make the tools available and I intend to do that work if someone does not beat me to it.

In the meantime, what happened when we built our package? Since we passed -D to check dependencies, dpkg-buildpackage called dpkg-checkbuilddeps and found that we cannot build our package because we are missing a dependency; Test::Manifest. You can run dpkg-checkbuilddeps separately and this is the output:

Listing 6.10: dpkg-checkbuilddeps output

```
dpkg-checkbuilddeps: Unmet build dependencies: libtest-manifest
    -perl (>= 1.14)
```

The above line tells us that the Perl module Test::Manifest needs to be included for and that it already exists in Debian as the package libtest-manifest-perl. Marvel

at the power of the apt system! It saved us a journey to dependency hell. We simply install libtest-manifest-perl and try to build again...

This time, success! Dpkg-buildpackage will ask me for my key passphrase, which I give it, and it signs the package for me. Now if we look in our dir we have:

Listing 6.11: Directory after successful dpkg-checkbuilddeps run

```
libtest-file-perl-1.25
libtest-file-perl_1.25-1_all.deb
libtest-file-perl_1.25-1.dsc
libtest-file-perl_1.25-1_i386.changes
libtest-file-perl_1.25-1.tar.gz
```

Hooray! We have our deb, signed and sealed. You can install it now with dpkg -i libtest-file-perl_1.25-1_all.deb but before we pass it out far and wide, let us take one final step and build it in a "clean room" or a minimal Debian install. This we can use as a baseline and assume that if it builds and installs here it can build and install anywhere. To do this we are going to use pbuilder which is a "personal package builder". It creates a chroot, downloads a minimal Debian install, adds your package and any dependencies and builds a deb for you. If that works, you can be reasonably sure it will work out in the greater wide world of the Debian installed base.

Here is the call:

Listing 6.12: pbuilder command

```
sudo pbuilder build libtest-file-perl_1.25-1.dsc
```

I will go through an arbitrary selection of pbuilder's output:

Listing 6.13: pbuilder output

```
I: using fakeroot in build.
Current time: Wed Feb 11 16:22:37 CET 2009
pbuilder-time-stamp: 1234365757
Building the build Environment
 -> extracting base tarball [/var/cache/pbuilder/base.tgz]
```

The base tarball gets unpackaged to create the build environment (figure 6.13).

Listing 6.14: pbuilder process continued

```
Get:1 http://ftp.debian.org sid Release.gpg [189B]
Get:2 http://ftp.debian.org sid Release [80.6kB]
Get:3 http://ftp.debian.org sid/main Packages/DiffIndex [2038B]
```

```
Get:4 http://ftp.debian.org sid/main 2009-02-10-2012.30.pdiff
    [5047B]
```

Here (figure 6.14) pbuilder updates the base Debian install with the latest diffs of packages so your clean room is up-to-date. You can update it manually as well and change the distribution you want to use, I prefer to use testing but you might want to use stable.

Listing 6.15: pbuilder process continued

```
Copying source file
    -> copying [libtest-file-perl_1.25-1.dsc]
    -> copying [./libtest-file-perl_1.25-1.tar.gz]
Extracting source
```

pbuilder pulls in our source for the package (figure 6.15).

Listing 6.16: dpkg-buildpackage takes over

```
dpkg-buildpackage: source package libtest-file-perl
dpkg-buildpackage: source version 1.25-1
dpkg-buildpackage: source changed by Jeremiah C. Foster <
    jeremiah@jeremiahfoster.com>
dpkg-buildpackage: host architecture i386
```

dpkg-buildpackage takes over and does its stuff.

Listing 6.17: Test failure!

```
Test::Manifest::test_harness found [t/load.t t/pod.t t/
    pod_coverage.t t/normalize.t t/test_files.t t/owner.t t/rt
    /30346.t]
t/load.............ok
t/pod..............skipped
        all skipped: Test::Pod 1.00 required for testing POD
```

Aha! I missed a useful tool. Since Test::Pod gets called while running tests, I should add it to Build-Depends-Indep in the debian/control file to get these tests to run. Of course it builds without it, but it is better to run all our tests as the original developer envisioned. Once I add that module and the module Test::Pod::Coverage which is also used in tests to the debian/control file, all the tests pass and the package gets built. This is a pretty good indication that this package will build on someone else's machine.

To confirm that we are in accordance with policy we ought to run the package through lintian, the Debian policy checker. I run it with the -i and -I flags which

provides much more verbose output, it has a --pedantic switch as well. We might run it against our deb like this:

Listing 6.18: lintian command

```
lintian -i -I libtest-file-perl_1.25-1_all.deb
```

And get output like this:

Listing 6.19: lintian output

```
E: libtest-file-perl: perl-module-in-core-directory usr/lib/
    perl/5.10/
N:
N:    Packaged modules must not be installed into the core Perl
     directories as
N:    those directories change with each upstream Perl revision
    . The vendor
N:    directories are provided for this purpose.
N:
N:    Refer to Debian Perl Policy section 3.1 (Site Directories
    ) for details.
N:
N:    Severity: important, Certainty: certain
```

[28]

These warnings are good to have, were you to submit your package for inclusion in Debian the expectation is that your package is “lintian clean” which means without warnings from lintian. Now we can submit this to Debian or put it in our own personal deb repo with confidence.

The package goes through some automatic building on a variety of architectures, sits in a queue for about ten days, then gets put into the Debian “testing” distro. Anyone who has Debian testing sources in the /etc/apt/sources.list will now be able to install it just by calling aptitude. Now your package or software is available to millions of users. Congratulations.

Intermission end

Rasmus Fleischer

7

Kopimi

Proceedings from autumn 2008

The decade between 1995 and 2005 roughly marks out the breakthrough of first the *www* (world wide web) and then *p2p* (peer-to-peer file-sharing). Those were the times when it was still possible to imagine a shift from an old and material to a new and virtual world, most distinctive in the Californian ideology of John Perry Barlow's *Declaration of Independence for the Cyberspace* (1996). It still made some sense to use bandwidth as a symbol for community and freedom, proclaiming that "Welfare starts at 100 mbit", as we did with Piratbyrån on May Day 2005, just before releasing the anthology *Copy Me* – which in retrospect reads as a time document over a brief but interesting era, published exactly at that end point.

Since then, we have moved ahead. After reaching the point when one realizes that *the files have been downloaded*, the question is no longer one of *access* but of *action*. What to do with all these files? My hypothesis is that, on a kind of collective level, this point was somehow reached in 2005, at the time when file-sharing also stabilized around the Bittorrent protocol. Of course the exchange of files will continue to increase quantitatively, but what really counts is not how fast a connection one has to the network, but how this abundance of data is actually used in space and time.

Some ideas which had a liberating potential in the last decade (1995-2005) – especially the idea of the digital as a "second life", detached from the old powers – may even have become reactionary or paralysing in the decade in which we now live (2005-2015).

On the one hand, copyright law continues to expand in the direction of neo-corporatism and of a permanent state of exception, which is something one has to deal with regardless of one's involvement in actual copyright infringements. On the other hand, we must deal with ethical and aesthetic questions which demand that we *ignore* copyright, or at least regard it as a thing of the past.

Now we can also realize that the exclusive attention that was given to band-width must be supplemented with other aspects of the digital, like storage. The simple fact is that storage capacity is increasing exponentially and much faster than internet bandwidth. Some simple quantitative extrapolation of this fact may help us formulate new, qualitative questions for the time we live in. I will do this from the perspective of music, as it is the most ambivalent of art forms, in-between product and process, poiesis and praxis.

We are approaching a point, predicted to occur within 10-15 years, when any cheap, pocket-size media player will have have space to store practically *all recorded music that has ever been released*. This gargantuan pocket archive will be created, and it will be copied from friend to friend. There will be absolutely no way for a rights holder to prevent that from happening.

Such a scenario is not good or bad in itself. But it opens the question: Will all music ever recorded have *any value at all* for us? How could the simple addition of one more song on top of such an archive produce any feeling whatsoever in us? When you sit there with all the music ever recorded – what do you do? The idea of just pressing "shuffle", to let musical history be played randomly, seems to open up an almost existential horror. The opposite idea of playing it all in alphabetic order is just plain stupid and would exceed human lifetimes.

It is actually doubtful whether any of these two choices would produce something that could seriously be called "music". Because music, as any improvising musician knows, can only be something in between total predictability and total randomness.

Imagining this archive of "all music ever" is not just speculation in some hypothetic future, because we already have access to much more media than we can incorporate in our lives. Through these common small white earphones, we are already – more or less – able to listen to any piece of recorded music, whenever,

wherever, while doing whatever. That means that any piece of recorded music – considered in isolation – is deprived of all its remaining emotional value.

Both 19th century western classical music and 20th century pop music were cultures resting on the belief that the sound of music could in itself reveal meaning to the listening individual. Still today, that logic is used conventionally to explain the difference between good and bad music. It is preserved first of all, of course, by the record industry and by the mass media, but it is also very present in various on-line music communities, including file-sharing sites. We must now discard that convention, and stop pretending that there can be any inherent value in a digital file. First the complete denial of this value allows us to explore and affirm new values. This process is well under way, but we may not yet have all the concepts needed to complete it.

When we can listen to any piece of music, whenever, wherever, while doing whatever – then we begin desiring musical experiences which can *not* be accessed anywhere and at any time. We begin seeking out contexts which are specific for a time or a place, an occasion or a friendship. Some of these contexts are by convention known as "live" music. Others are personal, like the association of a certain play-list to bus rides through foggy November mornings. In between the big and the small is a space for multiplication of informal habits.

One way to find directions for exploration is to simply negate everything that the iPod stands for. Using a strictly materialist approach, that negation drives us downwards, towards the sub-bass spectrum. Bass-centred music can *not* be experienced anywhere, because of the very physical need for very large speakers to produce really deep frequencies. It can indeed be recorded, digitalized and transported in the pocket, but it cannot be listened to in headphones during the transport. All you can listen to is a simulation. Such simulations are vital for creating a cultural continuity – but their musical value is never inherent in the hearing of any track, but is derived from the bodily memories of bass and the anticipations of being physically present at future occasions.

In fact, sub-bass is almost never an individual experience. Low frequencies have less respect for physical architecture (ask your neighbours), if played at the volumes that bass-centred music demands. They have, however, more respect for human ears than the higher-frequency sounds of a traditional rock concert.

I am talking about dub-step, which is a phenomenon rather than a musical genre. What keeps it together? First, a few clubs with extremely large bass woofers, primarily in South London, and in many cases using squatted space. Sec-

ond, a certain combination of internet protocols: internet radio (shout-cast protocol) with DJs playing in their own bedrooms while being in real-time interaction with the community in chat rooms (irc), with sessions being afterwards freely available in MP3 format on the web (http). Third, there are indeed record labels, usually integrated with the clubs, releasing most tunes only on vinyl. In short, the material constellation of dub-step is one possible way to create meaning out of abundance, while simultaneously maintaining an informal economy which does not really depend on copyright law, by systematically integrating the very digital with the very analogue.

It is not a coincidence that dub-step, as an extremely bass-centred musical phenomenon, emerged exactly in 2005. That was the year when the files had been downloaded, when the digital abundance had again to become anchored in time and space. Dub step is music for the current transitory decade of 2005-2015.

But of course, gigantic bass woofers are not the solution for everything. The morning after, we are back in front of the screen, with access to *all music ever recorded*, thinking about where to start. We will not just press "shuffle", and not just play the tracks alphabetically. And as anyone knows who has been in a similar situation, it is not simply to reconsider "what one likes". For the contemporary music fan in the climate of abundance, there is not even such a thing as a unitary individual taste, independent of a particular context in time and space.

Rather than individuals, we are "dividuals". That is also why all these automatic recommendation systems are still very primitive, defining "taste" just in terms of personalized listening statistics. Amazing developments on this field will come, for sure, as soon as we accept being geographically tracked, allowing certain parts of the city to be associated with certain musical tracks (which in its turn will performativize individual listening, knowing that it contributes to the databases containing these associations).

Automatic recommendation systems are a necessary help, and will continue to change our relations to music in many ways, but they can not solve the basic problem of having too much choice. You can always switch to an alternative software algorithm, just as the forward button on your iPod is keeping you aware that you can always shuffle on to the next song (which is a far more important difference between iPods and cassette tapes than any "sound quality").

Pure freedom could never be musical, just as the absence of any freedom couldn't. Musical experience happens in between, when you have a choice within certain limits, to work against something – and this goes for all musical activities,

"passive listening" as well as "active playing". A melody or a rhythm is a limit, just like a musical instrument, the acoustics of a room, or the human body when one sings or dances. Most importantly, the very presence of other people with other expectations is in itself a limit.

In order to find out what we want to enjoy, to create meaning out of abundance, we surely need some software, but most of all we need community. Only reference to collective contexts can save us from the terror of the shuffle button, and from the forced performativity of automated recommendation systems.

The digital poses questions whose answers can not remain within the digital, but demands the formation of provisional communities, where people can engage in a common selection, indexing, combination and actualization, connecting the digital to time and space. Size does matter a lot. Some recent experiments have been demonstrating how groups of 17[1] or 23[2] or 47[3] participants (for some weird reason this tends towards prime numbers) can further certain dynamics which are not possible either in the biggest stadium-size or the smallest kitchen-size event. Many times, these communities seem to thrive best in the grey zone in between what is usually regarded as the public sphere and the private sphere, often also in between the purely commercial and the purely non-commercial.

And here we get back to copyright! Because grey zones are generally not recognized by copyright law, copyright licences or copyright collecting societies. Copyright is dichotomizing. It always recognizes some kind of private sphere. Within the family you may copy without restrictions. You may even invite friends to your home to watch a movie, or to hear you sing a song, without asking for special permission or paying extra to any rights holder.

Copyright law does not step in to the picture until the copying or the performing becomes "public", at which point a completely different set of rules starts to

[1] Bill Drummond's choral project *The 17* (http://ur1.ca/f6o5), recently documented in a book with the same title, and the related performance No Music Day (http://ur1.ca/f6o6), generally resonates a lot with some standpoints expressed in this article.

[2] In 2008, Piratbyrån acquired an old city bus, named it S23M and drove it in the summer with 23 passengers and 100 mix-tapes, from Stockholm to the Manifesta Biennale in Südtirol, as an experiment in enacting a "digital" community to a very "analogue" context. This experiment has greatly influenced this whole article, and led to innumerable follow-up actions, including the autumnal journey S23X taking the bus eastwards to Ljubljana and Belgrade.

[3] When I am writing this sentence, I am listening to the dub-step net radio SubFM (http://ur1.ca/f6o7), in look up how many listeners we are at the very moment, getting the number 47. That's low, because right now they only reprise a session from an earlier night. Listener numbers go up a lot in the evenings when it is possible to interact directly with the radio DJ.

apply. Where to draw this line between private and public is, however, a matter of uncertainty and modulation.

Think about a group of people getting together every week to watch and discuss a selected movie and maybe also listen to some music. Week after week the group slowly grows, and it has to move to larger spaces. Sooner or later this group – or any informal activity emerging in the spectrum between private and public – will be pressured by copyright law to choose one of two paths: Either it has to keep small-scale and hidden from the public. Or it has to turn fully commercial, to put up advertisements or start selling expensive cocktails, so that licences to the industry can be paid.

Copyright is not just a repressive power, but is also productive. It shapes the contexts in which people can get together to create meaning out of abundance, by attempting to erase exactly the grey zones which we need most. Copyright materializes in the city, as well as in the architecture of computer networks.

In the latter, however, the definite walls seem to be lacking and must be simulated by software. Because computers operate by copying information all the time, and don't seem to care about physical distance, copyright law has quite serious problems with drawing a credible line between private use and public distribution through computer networks. Distinctions which where formerly within physical infrastructure, like the one between record distribution and radio broadcasting, actually collapses when on the internet the only difference between "downloading" and "streaming" is how the receiver's own software is configured. This is the main reason why today's conflicts over to copyright law are essentially about access to *tools* (indexing services like The Pirate Bay, stream ripping software, or codes for circumventing dvd encryption). The conflicts are not any more, like in the 20th century, about access to copyrighted *works*.

We must stop asking how artworks are best distributed within networks. Copyright conflicts concern the very meaning of terms like "artworks" and "networks". In the rhetoric about so-called Creative Industries, especially at a European policy level, "creativity" is defined as the production of ever more "content", irrespective of its context. Pure information, infinitely reproducible even if tightly controlled.

This discourse subscribes to an idea of the digital as a substitute for place-specific activities – an idea which somehow resembles the utopian net discourse of the previous decade.

Now we start realizing that one of the most fascinating properties of digital communications is that they can awaken a strong desire for exactly those things

which they cannot communicate. The digital is not a separate world, as the dominant ideology of 1995-2005 used to preach. It is always a complement to something else. But for what we never know in advance. We must invent it and that is an adventure that must take some time. All we know is that there can not be one single solution for everything.

The anxious search for "the solution" might be necessary to trigger the process of moving on. But in every such process comes a certain point when the anxiety must be unconditionally left behind.

Now our main task can't any more be to give more answers, to create more "content", or to invent fresh business models. Much more relevant than drawing up blueprints for how stuff should work in the future, is to here and now try out new ways to put all existing content into context. The general problem is abundance, not scarcity. What counts in the end is action, not access.

With Piratbyrån, we are co-developing a method known as kopimi. Kopimi is about affirming the will to copy and to be copied, without reservation, and to acknowledge the active and selective moment in all copying. It is, at the same time, about exploring that which can not be copied, that which slips away – and to enjoy it as it slips away. It is about valuing the very process of copying, while recognizing that no copy will be identical. Mutations always happen when as a copy it is connected to another place and another time.

Kopimi is an imperative – copy me! – not a theory. Thus it has no real origin, but is said to have emerged from a dance. When it is defined, it is always by means of selecting and copying definitions of other phenomena, letting these definitions mutate. That kind of process is probably the only "alternative" to copyright that kopimi can propose – an alternative not for individual "artists", but for artistic practise at large.

Of course, answers will be formulated, "content" will be created, and business models will be invented. Don't worry. From the perspective of kopimi, however, this comes merely as a side-effect to something much more crucial: the quest for ways to integrate the infinite abundance of information into our finite lives.

Johan Söderberg

8

Hackers GNUnited!

8.1 The political left and the politics of hackers

In this article I will look at hacking from a trade union perspective. The political significance of computer hacking has puzzled the old left, though there are some communicating bodies between the hacker movement and traditional, social movements. Most noticeable are those groups within the computer underground calling themselves 'hacktivists'. They want to apply their computer skills in furthering an already established political agenda, such as feminism or environmentalism[29]. More challenging is making sense of the political agenda of the mainstream of the hacker movement. One immediately comes up against the question of does the computer underground qualify as a social movement at all. Many hackers, perhaps the majority, would say that this is not the case. At best, politics is held to be secondary to the joy of playing with computer technology[30]. Even so, out of this passionate affirmation of computers have grown ideas with political ramifications. For instance, hackers who otherwise do not consider themselves as 'political' tend nevertheless to be opposed to software patents and state surveillance on the Internet, to mention just two examples. Indeed, these viewpoints are so widely shared in the computer underground that they look more like commonsense than politi-

cal stances. Some issues, such as campaigns against the expansion of intellectual property laws and the defence of freedom of speech, have been added to political agendas and are actively promoted by hacker lobby groups, two examples of which are the Free Software Foundation and the Electronic Frontier Foundation. These organisations are clearly involved in politics, though they claim that these interests cut along different axes than the traditional right-left divide. When social scientists have analysed the assumptions which lay behind the public statements of these hacker lobby groups however, they have usually found a close affinity with liberalism[31].

A couple of leftist writers have broken ranks in that they do not interpret hacking as a liberal ideology. Quite to the contrary, they believe that the hacker movement could revitalise the old struggles of the left, not just for individual freedom but also against injustice and inequality. The most renowned insider who has voiced such opinions about hacking is Eben Moglen. He is a law professor and was for a long time a senior figure in the Free Software Foundation. Moglen is also the author of *The DotCommunism Manifesto*, where he predicted that the anarchism of free software development would replace capitalist firms as the most efficient mode for organising production in the future[32]. The media scholar Richard Barbrook reasoned in a similar way when he was debunking the hype about 'free markets in cyberspace' which was touted in the 1990s. Instead he presented his own vision of a high-tech, anarchistic gift economy. The impulse to give would follow automatically from the fact that people on the Internet had a self-interest in sharing information freely rather than trading it on a market[33]. Arguably, the rise of Napster and later generations of file-sharing technologies could be said to have proven Barbrook right. Even more iconoclastic in his embrace of socialist rhetoric is the Slovenian philosopher Slavoj Zizek. He has paraphrased Lenin's endorsement of electricity by stating, tongue-in-cheek, that 'socialism equals free access to the Internet plus power to the Soviets'[34]. At least a few old-time communists are taking this idea seriously. They believe that computer technology has provided the missing link which at last could make a planned economy a viable alternative to the market economy[35].

But these positive affirmations of hacking and computer technology are probably minority opinions within the traditional left. There is a deeply rooted suspicion among leftist intellectuals towards computer technology and, by extension, its most zealot users, i.e. hackers. The Internet's origin in American cold war institutions is sufficient to put off many progressive thinkers[36, 37]. Add to that

the hype surrounding the Internet in the mid-1990s. It gave new lease to the old chestnut about the 'Information Age'. This notion dates back to the 1950s and conservative American sociologists who set out to disprove the continued relevance of class conflicts. By announcing an end to industrial society, they wanted to prove that tensions between the classes had been dissolved and the ideological struggle between liberalism and socialism was becoming obsolete. Consequently, left-leaning scholars have protested against notions about the rise of an Information Age and insisted on the continued existence of industrialism, capitalism, and class conflict[38]. To make this point they have only to call attention to the inhuman conditions under which computer electronics are manufactured in export zones in third world countries[39]. A report from 2008 has documented how girls in China as young as 16 years old are working twelve to fifteen hours a day, six or seven days a week, and barely earning a living[40]. These findings resonate with the historical circumstance that punched cards, numerical control machinery, mainframes, and other embryos of modern computers were instrumental in making blue-collar workers redundant and degrading craft skills at the point of production[41, 42].

Now, having briefly outlined the perplexed relation between the traditional left and the political thrust of hackers, this article will proceed by examining the political significance of hackers in the light of an old debate about factory machinery and labour. The Braverman Debate, as it is known after the author who started the controversy, harks back to the 1970s. Harry Braverman published a book where he argued that the deskilling of labour was an inherent quality of capitalism. The reason was that managers strove to become independent of highly skilled workers in order to keep wages down and unions politically weak. Braverman found support for his hypothesis in the writings of the pioneers of management philosophy. The pivotal figure among them, Winston Taylor, had laid the foundation of what is now known as 'scientific management' or 'Taylorism'. A central idea of scientific management is that the shop-floor ought to be restructured in such a way that tasks can be done with simple routines requiring a minimum of skills from employees. Taylor argued that this could be done through the introduction of factory machinery. Braverman showed how this strategy was being deployed in heavy industry during the mid twentieth century.

This insight can serve as a lens for looking at the political significance of computer machinery and the hacking of it. The novelty of this argument is that its analysis of hackers is formulated from a production-oriented perspective, as opposed to a consumer rights perspective. It will be argued that the rise of Free and

Open Source Software (FOSS) can be traced back to the industrial conflict between managers and workers. Furthermore, the similarity between the struggle of workers against factory machinery and the struggle of the hacker movement against proprietary software will be highlighted. Free access to source code, a key concern of hackers, contradicts the factory system and the logic of scientific management in computer programming[43]. Though the situation of programmers compared to blue-collar workers is very different in many respects, the article notes that both groups are preoccupied with the goal of preserving skills and worker autonomy in the face of rapid technological change. Hackers' demand that source code should be freely accessible can be interpreted as part of a strategy which is aimed at preserving the programmer's know-how and his control over the tools of his trade.

8.2 The machine at work

The ambivalent feelings of enthusiasm and fear which computer technology often evokes among people have a historical precedent. At the dawn of the industrial revolution, it was hotly debated in all quarters of society what mechanisation would do to the human being, both socially and spiritually[44]. Even some of the forerunners of liberal economic theory, such as David Riccardo, admitted that the working class had good reasons for being resentful of factory machinery[45]. The wretchedness which befell workers who were subjugated under machinery and factory discipline was vividly described by James Kay, a social reformer who worked as a doctor in the slums:

> "While the engine runs the people must work – men, women and children are yoked together with iron and steam. The animal machine – breakable in the best case, subject to a thousand sources of suffering – is chained to the iron machine, which knows no suffering and no weariness."[46]

Early management writers like Andrew Ure and Charles Babbage welcomed this opportunity and advised factory owners how to design machinery in order to keep workers docile and industrious[47, 48]. Their testimonies informed Karl Marx's analysis of capitalism. He denounced factory machinery as 'capital's material mode of existence'. But he also qualified his critique against technology by adding that: "It took time and experience before the workers learned to distinguish between machinery and its employment by capital, and therefore to transfer their

attacks from the material instruments of production to the form of society which utilises those instruments."[49]. Thus Marx renounced the strategy of machine breaking which had been the hallmark of the Luddites. The Luddites consisted of combers, weavers, and artisans who felt that their trade was threatened by the introduction of new looms and a subsequent reorganisation of the textile industry. Nightly raids were conducted to smash wool mills and weaving frames owned by 'master weavers'. These activities culminated in 1811-1813 and at one time the English Crown had to deploy 14,400 soldiers in the region to crush the nightly insurgencies. Quite remarkably, more English soldiers were mobilised against the Luddites than had been sent to Portugal four years earlier to face Napoleon's army[50]. In his classic re-examination of the Luddite uprising, Eric Hobsbawm showed that the breaking of machines was not a futile resistance against technology and progress, as it was later made out to have been. Instead he interpreted it as a method of 'collective bargaining by riot'. Breaking the machinery was one option, but workers could also put pressure on their employers by setting fire to the warehouse or sending anonymous threats. Hobsbawm concluded that, if judged by the ability of workers to preserve their wages and working conditions, they had been moderately successful[51].

The misreading of the Luddite rebellion as deranged, irresponsible, and, most importantly, as having nothing at all to do with politics, resembles the portrayal of hackers in news media today. Andrew Ross has protested against the image of the hacker as a petty criminal, a juvenile prankster, or, alternatively, a yuppie of the Information Age. He stresses that spontaneous sabotages by employees contributes to most of the computer downtime in offices. These attacks often go unreported since managers prefer to blame external adversaries. With this observation in the back of his mind, he suggests a much broader definition of hacking:

> "While only a small number of computer users would categorize themselves as 'hackers', there are defensible reasons for extending the restricted definition of *hacking* down and across the case hierarchy of systems analysts, designers, programmers, and operators to include all high-tech workers – no matter how inexpert – who can interrupt, upset, and redirect the smooth flow of structured communications that dictates their position in the social networks of exchange and determines the pace of their work schedules."[52]

Andrew Ross' suspicion is confirmed by studies conducted by employers' organisations. Personnel crashing the computer equipment of their employers is a more common, more costly, and more dreaded scenario for firms than the intrusion by external computer users. According to a survey in 1998 conducted jointly by Computer Security Initiative and the FBI, the average cost of a successful computer attack in the U.S. by an outsider was $56,000. In comparison, the average cost of malicious acts by insiders (i.e. employees) was estimated to $2.7 million[53]. The fondness of employees for attacking the computer systems of their employers underlines the role of computerisation in transforming the working conditions of white-collar office workers. Ross' comparison with sabotage will certainly raise some objections among 'real' hackers. Those of the hacker movement who want to be 'fit for the drawing room' try to counter the negative media stereotype of hackers by differentiating between original hackers and so-called crackers. The former name is reserved for creative uses of technology which contributes to socially useful software projects. The negative connotations of computer crime are reserved for the latter group[1].

These efforts at improving the public relations of hackers merely underline the historical parallel with labour militancy suggested above. The trade union movement too has rewritten its own history so that sabotage, wildcat strikes and acts of violence are left out of the picture. Indeed, unions have been very successful in formalising the conflict between labour and capital into a matter of institutionalised bargaining. The case could be made, nonetheless, that the collective bargaining position of labour still relies on the unspoken threat of sabotage, strikes and riots[54]. In the same way, I understand the distinction between hackers and crackers to be a discursive construction that does not accurately portray the historical roots and the actual overlapping of the subculture. Rather, it seeks to redefine the meaning of hacking and steer it in one particular direction. In spite of the success of this rhetoric, it is nevertheless the case that the release of warez, the breaking of encryptions, and the cracking of corporate servers play a part in the larger struggle to keep information free.

Having said this, the reader would be right in objecting that the motivation of Luddites and workers for rejecting factory and office machinery is very different from the motivation of hackers who are fighting against proprietary software. For

[1]For instance, the Jargon file, which is considered to be the authoritative source on hacker slang, goes out of its way to distinguish between crackers and 'real' hackers: http://ur1.ca/f6o3 (accessed: 27-05-2009)

the latter group, computers reveal themselves as consumer goods and sources of stimulus. Arguably, their relation to technology is one of passion rather than hostility. Even when hackers (crackers) sabotage corporate servers, it is an act out of joy. Discontented office workers might also take some pleasure in destroying the computer of their employer, but it is still meaningful to say that their act springs from resentment against their situation. This difference in motivation does not, however, rule out the possibility that hackers share some common ground with machine breakers of old. Both are caught up in a struggle which is fought out on the terrain of technological development. It might even be that the passionate affirmation of technology by hackers offers a more subversive line of attack, in comparison to, for instance, the insurgency of Luddites. Though it is incorrect to say that Luddites were against technology *per se*, it is true that they defended an outdated technology against a new, scaled-up factory system. Thus it appears in hindsight as if their cause was doomed from the start. Hackers, in contrast, have a technology of their own to draw on. They can make a plausible claim that their model for writing code is more advanced than the 'factory model' of developing proprietary software.

8.3 Deskilling of workers, reskilling of users

It is a strange dialectic which has led up to the current situation where hackers might reclaim computer technology from companies and government institutions. Clues as to how this situation came about can be sought in a retrospective of the so-called Braverman Debate. The controversy took place against the backdrop of the idea about the coming of a post-industrial age[55]. Two decades later, the same idea was repackaged as the 'rise of the Information Age' or the 'Network Society'. This notion has come in many hues but invariably paints a bright future where capitalism will advance beyond class conflicts and monotonous work. Crucially, this transition has not been brought about through social struggle but owes exclusively to the inner trajectory of technological development. Harry Braverman targeted one of its key assumptions, namely that the skills of workers would be upgraded when blue-collar jobs were replaced with white-collar jobs. He insisted that the logic of capital is to deskill the workforce, irrespectively whether they are employed in a factory or in an office. Instead of a general upgrading of skills in society, he predicted that the growth of the so-called 'service economy' would result

in white-collar office workers soon confronting routinisation and deskilling just as the blue-collar factory workers had done before.

> "By far the most important in modern production is the breakdown of complex processes into simple tasks that are performed by workers whose knowledge is virtually nil, whose so-called training is brief, and who may thereby be treated as interchangeable parts."[56]

His statement was rebutted by industrial sociologists. They acknowledged that deskilling of work is present in mature industries, but argued that this trend was counterbalanced by the establishment of new job positions with higher qualifications elsewhere in the economy. At first sight, the emergence of the programming profession seems to have proven the critics right. One of the critics, Stephen Wood, reproached Braverman for idealising the nineteenth century craft worker. Wood pointed at the spread of literacy to prove that skills have also increased in modern society[57]. His comment is intriguing since it brings into relief a subtlety that was lost in the heated exchange. It is not deskilling *per se* that is the object of capital, but to make workers replaceable. When tasks and qualifications are standardised, labour will be cheap in supply and lack political strength. From this point of view, it doesn't really matter if skills of workers level out at a lower or higher equilibrium. Universal literacy is an example of the latter.

Literacy in this regard can be said to be analogous to present-day campaigns for computer literacy and calls for closing the 'digital gap'. In a trivial sense, skills have increased in society when more people know how to use computers. One might suspect that a strong impetus for this, however, is that computer literacy reduces a major inertia in the scheme of 'lifelong learning', that is, the time it takes for humans to learn new skills. Once workers have acquired basic skills in navigating in a digital environment, it takes less effort to learn a new occupation when their old trade has become redundant. This somewhat cynical interpretation of computer literacy can be illustrated with a reference to the printing industry. The traditional crafts of typesetting and printmaking took many years to master and it required large and expensive facilities. The union militancy which characterised the printing industry was founded upon this knowledge monopoly of the workers. The introduction of computer-aided processes was decisive for breaking the strength of typographic workers[58]. Personal computers can be seen as an extension of this development. Software mediation allows the single skill of navigating in a graphical interface to translate into multiple other skills. With a computer

running GNU/Linux and Scribus, for instance, the user is able to command the machine-language of the computer and can imitate the crafts of printmaking and typesetting. Very little training is required to use these programs compared to the time which it took for a graphical worker to master his trade. This suggests how computer literacy reduces the inertia of human learning and makes the skills of workers more interchangeable. Liberal writers interpret this development as an example of linear growth of learning and education corresponding with the so-called 'knowledge society'. From the perspective of labour process theory, quite to the contrary, the same development is seen as a degradation of the skills of workers and ultimately aimed at weakening the bargain position of trade unions.

David Noble's classic study of the introduction of numerical control machinery in heavy industry in the mid twentieth century provides the missing link between Braverman's argument about deskilling and the current discussion about computers and hackers. One thing which his study sheds light on is how the universality of the computer tool was meant to work to the advantage of managers. Their hope was that it would weaken the position of all-round, skilled machinists. Special-purpose machinery had failed to replace these labourers, since initiatives had still to be taken at the shop-floor to integrate the separate stages of specialised production. In contrast, general-purpose machines simulated the versatility of human beings, thus it was better fitted to replace them[59]. This historical connection is important to stress because it is now commonplace that the universality of computer tools is assumed to be an inherent quality of information technology itself. Thus the trajectory towards universal tools has been detached from its embeddings in struggle and is instead attributed to the grace of technological development.

Saying that does not oblige us to condemn the trend towards a levelling out of productive skills and the growth of universal tools such as computers. On the contrary, in sharp contrast to the negative portrayal of Harry Braverman as a neo-Luddite, Braverman reckoned that the unification of labour power caused by machinery carried a positive potential.

> "The re-unified process in which the execution of all the steps is built into the working mechanism of a single machine would seem now to render it suitable for a collective of associated producers, none of whom need spend all of their lives at any single function and all whom can participate in the engineering, design, improvement, repair and operation of these ever more productive machines."[60]

With a universal tool, the computer, and the near-universal skill of using the computer, the public can engage in any, and several, productive activities. It is from this angle we can start to make sense of the current trend of 'user empowerment'. In other words: Displacement of organised labour from strongholds within the capitalist production apparatus, through a combination of deskilling and reskilling, has prepared the ground for computer-aided, user-centred innovation schemes. Because programs like *Inkscape* and *Scribus*, and their proprietary equivalents, are substituting for traditional forms of typesetting and printmaking, a multitude of people can produce posters and pamphlets, instantly applicable to their local struggles. Companies have a much harder time controlling the productive activity now than when the instruments of labour were concentrated in the hands of a few, though relatively powerful, employees. What is true for graphic design equally applies to the writing of software code and the development of computer technology. Here the Janus face of software comes to the fore: the very flexibility and precision by which software code can be designed to control subordinated workers the same ease allows many more to partake in the process of writing it. Though embryonic forms of computer technology, such as numerical control machinery, were introduced at workplaces by managers in order to free them from their dependency on unionised and skilled workers; as a side-effect, computer technology has contributed to the establishment of user-centred production processes partially independent of managers and factories. The free software development community can be taken as an illustration of this.

8.4 Free software as a trade union strategy

The corporate backing of the Free and Open Source Software (FOSS) development community must be seen against the background of a restructured labour market. During the last few decades, industrial sociologists have documented a trend where the factory is losing its former status as the role model of production. The point of production has become increasingly decentralised and spread out in a network of subcontractors, freelancers, work-at-home schemes, and franchisees[61]. Companies can now add volunteer development communities to the list of heterogeneous forms for contracting labour. Or, saying it with a catchphrase, labour is outsourced and open sourced. The opportunity to drastically cut labour costs for software maintenance has attracted government institutions, vendors, service providers, and hardware manufacturers to FOSS. The savings that are made by giants such as

IBM, the U.S. Army, and Munich city, to mention a few high-profile cases, has created the space for specialised software firms to sell free software products and services. This analysis is consistent with Tiziana Terranova's critical remark that the engagement of free labour has become structural in the cultural economy. She protested against the many hopes and claims made about the trend of active media consumption, first celebrated in the cultural studies discipline from the 1980s and onwards and most recently updated with the hype around Web 2.0. In response to these often unfounded claims, Terranova responded that capital has always-already anticipated the active consumer in its business strategies[62] (2000). Her argument provides a corrective to the uncritical appraisals of the fan fiction subculture, the creative commons licence, and other expressions of 'participatory media'. Nevertheless, in my opinion, left-leaning critics like Terranova have been too eager to cry out against the economic exploitation of volunteer labour and have thus failed to see the potential for political change which also exists in some of these cases.

The relevance of my objection has to be decided on a case-by-case basis. While I concede that the interactivity of video games and the volunteer efforts of fan fiction writers is unlikely to result in any substantial political change, the interactivity and the gift-giving of free software developers cannot be tarred with the same brush. Here it must be taken into account that the software code is given away together with a clearly articulated, political goal: to make free software the standard in computing. It is true that this standpoint is not anti-commercial in a straightforward sense. As is probably known to the reader, the General Public Licence (GPL) protects the right of the user to run software for any purpose, including commercial purposes[63]. In practice, of course, this option is limited by the fact that GPL also allows sold copies to be copied and given away for free. While the free licence resides perfectly within an idealised free market, it is ungainly within the actually existing market which always presupposes quasi-monopolies and state regulations[64].

This goes some way to explain why the political right is in two minds about free software licences. Self-acclaimed libertarians, such as Eric Raymond, see the growth of open source business models as a better approximation of the free market. Behind this assessment lies an understanding of capitalism as basically identical with its institutions, i.e. private property, free markets and contracts. But that outlook disregards another possible definition of capitalism which puts stress on capital as self-expansion of money, or, in other words, accumulation. The latter viewpoint is central to Marx's analysis of capitalism, but it is also closer to the

concerns of the 'captains of industry'. With that in mind, it can be interesting to take notice of market research which *claims that the adoption of FOSS* applications by businesses are eating into the annual revenues of proprietary software vendors by $60 billion per year. Crucially, the losses to proprietary software companies are disproportionate to the size of new FOSS markets, for the simple reason that a lot of it is not paid for.[2]. Hence, the opposition against FOSS from parts of the industry is not necessarily as misplaced as it has often been made out to be. This opposition reached a climax in the court case between the SCO Group and corporate vendors of GNU/Linux which came to an end in 2007. During the court case, the executive officer of the SCO Group, Darl McBride, wrote an open letter to the American Congress where he accused his competitors of being naïve in supporting FOSS licences: 'Despite this, we are determined to see these legal cases through to the end because we are firm in our belief that the unchecked spread of Open Source software, under the GPL, is a much more serious threat to our capitalist system than U.S. corporations realize.'[3].

At the very least, these worries among some parts of the computer industry show that free software developers cannot be written off as mere unsuspecting victims of commercial exploitation. Perhaps it would be more justified to say that hackers, by freely offering up their labour, are blackmailing corporations into adopting and spreading the FOSS development model. No company answering to the market imperative of lowest costs can afford to argue against free (as in free beer) labour. My hypothesis is that advocacy for free licences can be interpreted in the light of an emerging profession of computer programmers. This suggestion is far from obvious since the identity of the hacker is tied up with the notion of being a hobbyist, or, in other words, a non-professional, non-employee. Contradicting this self-image, however, numbers have it that the majority of the people contributing to free software projects are either working in the computer industry or are in training to become computer professionals[66]. Hence, it is not so far-fetched to connect the dots between hackers and the labour market that awaits them. Indeed, this line of reasoning has already been attempted in Josh Lerner and Jean Tirole's famous article[67]. They wanted to square the supposed altruism of free software developers with the assumption in neo-classical economic theory about the 'rational economic man'. The two authors concluded that hackers are giving away code

[2]The market research rapport referred to is called Trends in Open Source and has been published by the Standish Group. Because access to the material is restricted, information about it comes from news media[65]

[3]http://ur1.ca/f6o4 (accessed: 01-11-2009)

for nothing in order to create a reputation for themselves and improve their chances for employment at a later date. Without denying that such cases may exist, I disagree with the assumption of methodological individualism that underpins their thinking. When I say that free software licences might be beneficial to the labour interests of computer programmers, I do not mean that this is a rationally calculated strategy or that it is an exhaustive explanation as to why hackers license their software under GPL. Furthermore, in contrast to Lerner and Tirole, I do not think that those labour interests are pursued exclusively through individual strategies. In addition to improving their own reputation, individual hackers are contributing to changing the labour market for programmers as a collective.

It sounds counter-intuitive that programmers would improve their bargaining strength vis-a-vis firms by giving away their work to potential employers. Let me start by returning to an insight of Harry Braverman. He stressed that the very outlay of the factory put the machine operator at a disadvantage. The worker could only employ skills when given access to the machinery. Unfortunately, the scale and mode of organisation of the factory was already biased towards hierarchy. The capitalist had an advantage due to the ownership of the machines and buildings, without which the workers could not employ their abilities. The only bargain chips that the workers had were their skills and intimate knowledge of the production process. This was also how Braverman explained the tendency that capitalists are pushing for technologies which reduce skilled labour. What has happened since Harry Braverman made his analysis in the 1970s is that the large-scale Fordist machine park has grown obsolete in many sectors of the economy. This is particularly true in the computer industry. Productive tools (computers, communication networks, software algorithms, and information content) are available in such quantities that they have become a common standard instead of being a competitive edge against other proprietors (capitalists) and a threshold towards non-possessors (workers). A horde of industrial sociologists and management philosophers have written about this trend since the early 1980s[68]. It is a truism in this body of literature to claim that the employees, not the machine park, are nowadays the most valuable resource of the modern corporation. The claim is clouded in rhetoric, but the validity of the statement can be tested against the adoption of 'non-disclosure agreements' within the computer industry. It is here stated that the employee is not allowed to pass on sensitive information about the firm. Another kind of clauses which are sometimes included in the employment contract to much the same effect, i.e. to prevent leakages, forbid the programmer from working with similar tasks

for a competitor after having left his current employer. These agreements can be taken as testimonies that the knowledge and skills of the programmers have indeed become increasingly precious to the firm to exercise control over. I will argue that these practices, though they formally have very little to do with copyright law, nevertheless brace up my claim that proprietary and free licences affect the bargaining position of software developers.

The justification for these different kind of contractual agreements is the necessity of preventing trade secrets from leaking to competitors. However, as a side-effect, the programmers are prevented from moving freely to similar positions in their trade. Since the programmer becomes a specialist in the field in which he has been working, he might have difficulties in finding a job in a different position. The significance of this observation becomes clearer against the background of Sean O'Riain's ethnographic study of a group of software technicians working in a computer firm in Ireland. It has proved to be very difficult for trade unions to organise these workers. Since jobs are provided on a work-for-hire basis, the collective strategies of unions lack purchase. One of O'Riain's conclusions is that mobility has instead become the chief means by which the employees negotiate their working conditions and salaries[69]. With awareness of this fact, the significance of the contractual agreements mentioned above must be reconsidered. The limitations which they put on the ability of employees to 'vote with their feet' means that the firms get the advantage back. As to what extent non-disclosure agreements and other clauses are actually used in the Machiavellian way sketched out here is something which remains to be investigated empirically. What interests me in this article, however, is that the very same argument can be applied to proprietary software licences more generally.

Intellectual property[4] too is justified by the necessity of firms to protect their knowledge from competitors. A complementary justification is that intellectual property is required so that producers can charge for information from consumer markets. But intellectual property is also likely to affect the relation between the firm and its employees, a subject which is less often discussed. A case can be made that proprietary licenses prevents the mobility of employees. It ensures that the knowledge of employed programmers is locked up in a proprietary standard

[4]Many critics of copyright and patent law reject the words 'intellectual property'. In their opinion, the words are loaded with connotations that mislead the public. Instead they advocate the words 'intellectual monopoly'. I am unconvinced by this argument though there is no space to develop my counter-position here. It suffices to say that I will use the words 'intellectual property' in the article as I think that the association with other kinds of property is entirely justified

owned by the firm. A parallel can be drawn with how the blue-collar worker depends on the machine park owned by the industrialist. Without access to the factory the worker cannot employ his skills productively. In the computer industry, as was mentioned before, most of the tools that the programmer is working with are available as cheap consumer goods (computers, etc.). Hence, the company holds no advantage over the worker by providing these facilities. But when the source code is locked up behind copyrights and software patents, large amounts of capital are required to access the programming tools. As a consequence, the software licence grants the firm an edge over the labourer/programmer. This theoretical reasoning is harder to prove empirically than the claim made before that clauses in the employment contract might be used to restrict the mobility of programmers. Even so, it might be of an order of magnitude greater in importance to the working conditions in the computer sector. Indeed, this production-oriented aspect of proprietary licences might be as significant as the officially touted justifications for intellectual property law, i.e. to regulate the relation between the firm and its customers and competitors. If I am correct in my reasoning so far, then the General Public Licence should be read in the same light. I was led to this thought when reading Glyn Moody's authoritative study of the FOSS development model. He makes the following observation concerning the exceptional conditions for firms specialised in selling services in connection to free software:

> "Because the 'product' is open source, and freely available, businesses must necessarily be based around a different kind of scarcity: the skills of the people who write and service that software."[70]

In other words, when the source code has been made publicly available to everyone under the GPL, the only things which remain scarce on the market are the skills required to employ the software tools productively. And this resource is inevitably the faculty of 'living labour', to follow Karl Marx's terminology. It is thus that the programmers can get an edge over the employer when they are bargaining over salary and working conditions. The free licence levels the playing field by ensuring that everyone has equal access to the source code. Terranova and like-minded scholars are correct in pointing out that multinational companies have a much better starting position when exploiting the commercial value of free software applications than any individual programmer. The savings that IBM makes from running Apache on its servers are, measured in absolute numbers, many times greater than the windfalls bestowed on any programmer who has contributed to the

project. Still, at a second reading, the programmer might be better off if there exists a labour market for free software developers, compared to there being no such occupation available. By publishing software under free licences, the individual hacker is not merely improving his own reputation and employment prospects, a point which has previously been stressed by Lerner and Tirole. He also contributes to the establishment of a labour market where the rules of the game are rewritten, for him and for everyone else, in his trade. It can be interpreted as a kind of collective action adapted to a time of rampant individualism.

It remains to be seen if the establishment of a labour market in free software development translates into better working conditions, higher salaries and other benefits otherwise associated with trade union activism. Such a hypothesis needs to be substantiated with empirical data. Comparative research of people freelancing as free software programmers and those who work with proprietary software is much wanted. Such a comparison must not, however, focus exclusively on monetary aspects. As important is the subjective side of programming. An example hereof is the consistent finding that hackers report that it is more fun to participate in free software projects than it is to work with proprietary software code[66]. Neither do I believe that stealth union strategies are the sole explanation as to why hackers publish under GPL. Quite possibly, concerns about civil liberties and the anti-authoritarian ethos within the hacker subculture are more important factors. Hackers are a much too heterogeneous bunch for them all to be included under a single explanation. But I dare to say that the labour perspective deserves more attention than it has been given in popular press and academic literature until now. Though there is no lack of critiques against intellectual property law, these objections tend to be formulated as a defence of consumer rights and draw on a liberal, political tradition.

There are, of course, some noteworthy exceptions. People like Eben Moglen, Slavoj Zizek and Richard Barbrook have reacted against the liberal ideology implicit in much talk about the Internet and related issues. They have done so by courting the revolutionary rhetoric of the Second International. Their ideas are original and eye-catching and often rich with insight. Nevertheless, the revolutionary rhetoric sounds oddly out of place when applied to pragmatic hackers. Advocates of free software might do better if they look for a counterweight to the hegemony of liberalism in the reformist branch of the labour movement, i.e. in trade unionism. I believe that such a strategy will make more sense the more the computer industry matures. In accordance with Harry Braverman's general line

of argument, the profession of software engineering has already been deprived of much of its former status. Indeed, from the early 1960s and onwards, writers in management journals have repeatedly been calling for the subjugation of programmers under the same factory regime which had previously, and partly through the introduction of computer machinery, been imposed on blue-collar workers[71]. With this history in the back of the mind, I would like to propose that the advocacy of free software, instead of falling back on the free speech amendment in the American Constitution, could take its creed from the 'Technology Bill of Rights'. This statement was written in 1981 by the International Association of Machinists in the midst of a raging industrial conflict:

> "The new automation technologies and the sciences that underlie them are the product of a world-wide, centuries-long accumulation of knowledge. Accordingly, working people and their communities have a right to share in the decisions about, and the gains from, new technology."[72]

8.5 Acknowledgements

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Victor Stone

9 Unexpected Collaborations

9.1 Introduction

In late 2004, I started work as an independent contractor for Creative Commons (CC)[1] on a website that would be called *ccMixter.org*. I am the project lead which means developer and site administrator and I am also a musician on the site, with the *nomme de Web* of "fourstones".

The ccMixter project is not a financial enterprise. The goal of the project was to drive adoption of the CC licences with musicians in the same way they had been embraced in other publishing media, such as blogs and photography, and to provide a concrete example of the benefits of freewheeling re-use.

Working together with WIRED Magazine, CC made a big splash into the music world in November of 2004[2]. A CD featuring CC licensed music by Beastie Boys, My Morning Jacket, David Byrne, Chuck D and others was bundled with

[1] Creative Commons is a non-profit intellectual property advocacy group that provides tools for content authors to make it easier to share their works. Chief amongst these tools is a set of pre-authored licences that signify to the artists' Web audience, which part(s) of their copyright they are willing to suspend. The ccMixer project is a rare case where they actually host 3rd party content (music) on a Web site.
http://ur1.ca/fdui

[2] Thomas Goetz "Sample the Future" November 2004 http://ur1.ca/fduk

that month's WIRED magazine and a remix contest, hosted on the new site ccMixter, was announced[3]. The site outlived the contest and continues to allow uploads of CC licensed music. The total impact is incalculable, but four years later there are millions of pieces of audio on the Web under CC licences, so in that sense, the project can be viewed as a success[4].

9.2 On Collaboration

Many music collaboration sites have sprung up in the last few years, including several that incorporate Creative Commons licences. Most employ the virtual version of the met-at-a-bar-jammed-in-the-garage model of musicians getting together. Typically a songwriter will proffer an a cappella and post a request for collaborators with specific requests such as "this track needs a bass part" or "help me punch up the chorus". Willing musicians will sign up to collaborate and the group will exchange files in a project-based user model.

To be completely subjective and provocative I will say that the vast majority of these musical projects leave much to be desired. While the social aspects are very reassuring for many musicians, this way of working online exposes some fundamental flaws:

1. Most successful collaborations are the result of musicians who have been playing together for many, many years, learning each others' musical vocabulary, making micro-corrections to their own playing in real-time. Other successful collaborations are based on a common expertise between the musicians, such as a deep knowledge and virtuosity within the confines of a well-understood, specific genre. Finally, there is a class of musicians who are trained in the art of accompaniment. They are specialists who make split second, spontaneous, reflexive decisions based on vigorous training: they can follow a singer deep into the weeds. Otherwise, face-to-face collaboration is wholly overrated. We think it works so well because when it works it is a magical experience for everybody involved. However, for every inspired collaboration there are literally millions that never leave the garage (and don't, thankfully).

[3]Matt Haughey - Creative Commons blog, "Wired CD tracks online, and CC Mixter, our new remix community site, launched" November 11th, 2004 http://ur1.ca/fduo

[4]CC Content Directories "Audio" section http://ur1.ca/fdup

2. Explicit collaboration on the Web shines a glaring spotlight on any weakness existing between first-time collaborators. Most collaborations are painful, artistic disasters and taking those out of the garage and exposing them on the Web only makes the case. All of the mis-steps that are part of the natural process of an evolving collaboration, that would normally be hidden away in private, are exposed for everybody to see. It's the equivalent of putting a 24 hour web-cam into a sausage factory's R&D lab.

3. Finishing a collaboration is a serious, disciplined chore. Most of those in real life (and therefore on the Web) are interrupted by real life commitments and therefore never reach a satisfying level of completion.

4. Collaborators regularly *settle* for parts (backing tracks as well as vocals) because of time and closure pressures mentioned above but also because of social issues. How many times can you iterate with a bass player who is cheerfully volunteering his time and energy but who is, alas, continually giving you lousy bass parts? The vast majority of musicians I know are way too nice to be Simon Cowell about it and say, "Sorry, thanks for the effort but you suck."

Roughly two years after the ccMixter project got under way, several community members put pressure on me to enable these types of explicit collaborations. I took a survey of features at sites that specialized in such things and within a few weeks turned on the "Collaboration" feature at ccMixter. Not surprisingly, the feature suffered from all the ailments I outline above. Additionally, its presence caused confusion on the site about how to engage other musicians. A year and a half after I had enabled the feature, the vast majority of collaboration projects were started by newcomers who did not understand the sample pool model of collaborating, which is primary to the site. (There was also a fair amount of abuse of the feature: by the end, more spam type projects were being created than legitimate ones.)

Taking luxuriant advantage of being a purist, non-profit site, I finally removed the feature. With only about 20 completed collaboration projects (compared to over 7,500 remixes) it seemed reasonable. Some consternation arose about the method I used to discontinue the feature (I gave a few weeks' notice on the site's forum) but no other hue and cry ensued. A commercial entity or one solely interested in pumping up the membership numbers may have addressed any newcomer confu-

sion head on. They may have accepted a hit on the overall quality of music on the site in the name of offering a model of sharing that musicians already understand.

The idea behind ccMixter is to fight through the bramble and get to a better way to serve musicians. The model at ccMixter may have been obvious sooner to more people (including myself) if the exchange of music was not encumbered by an overwhelming imbalance towards "All Rights Reserved". In a marketplace where every note is packaged with a price tag, creativity is locked away in that packaging and therefore unavailable[5]. Thanks to the vision of Lucas Gonze, Neeru Pahria, Mike Linksvayer and the support of Creative Commons, we can now see an environment where creativity flows unencumbered as the currency of exchange between musicians.

9.3 The ccMixter Laboratory

[Creative Commons licences] represent a visible example of a type of creativity, of innovation, which has been around for a very long time, but which has reached new salience on the Internet - distributed creativity based around a shared commons of material.

James Boyle, *The Public Domain: Enclosing the Commons of the Mind*

On the surface, ccMixter is a music site that accepts three kinds of submissions: samples, *a cappellas* and the remixes that incorporate them. When a remixer is uploading, he is presented with a simple interface that helps him identify which samples, *a cappellas* or other remixes he sampled. This allows all three types of submission to link to each other, signifying the specific relationships between them. Simplistic as the idea seems at first glance, the freedoms flowing throughout this linking relationship have sparked an exciting set of developments.

The most rewarding aspect of the last four years has been witnessing how many musicians relate to what is going on at ccMixter, especially those that had no previous connection to the open music movement. In a music industry that pits musicians against each other in a frenzy of demagoguery, here is a place for gifts exchanged in a spirit of cooperation and kinship. It is obvious that many musicians long for the values of the sharing economy, even when looking for rewards from the commercial economy. For all the lecturing, vilification and criminalization they've

[5]This paragraph is a remix of a section from *The Gift: How the Creative Spirit Transforms the World* Lewis Hyde 1979, pg 82., the key phrase of which is "A scientist may conduct his research in solitude, but he can not do it in isolation."

had to endure, maybe it is this generation that could teach the previous one about how to avoid the need for "reparations" later on[6].

Philosophically, the ccMixter project is part of what Lewis Hyde calls the "gift economy"[7], Lawrence Lessig references as the "sharing economy"[8] and related to what John Buckman calls the "Open Music" movement[9]. "In a free market," Hyde explains, "the people are free, the ideas are locked away[10]." Liberated from the commercial marketplace, ccMixter leverages the Internet to its fullest by demonstrating "distributed creativity based around a shared commons of material". As these authors would have predicted, but took many of us by surprise when it actually worked, ccMixter has become an engine for creative innovation.

9.4 The Sample Pool

We are lightened when our gifts arise from pools we cannot fathom.
Lewis Hyde *The Gift*

Traditionally, musicians can interact through an implicit collaboration in which a musician's only contact with another is through a score, sheet music or audio recording. Digital recording techniques have been a revolution for implicit collaborations. There are countless terabytes of commercially available sample in libraries and embedded in electronic instruments. All of those packagings have their own custom formulated licences creating individual islands of copyrighted material. Unlike the recording industry, sample library vendors are much less eager to sue musicians who violate the terms of these licences. Dangers are still there, however, and at least one popular audio tool vendor was shaken to the point of declaring they will "remove all melodic loops" from their offerings[11].

CC licensed samples offer a way out, but it was important that ccMixter would not be seen as the host for CC samples. Instead, it was our hope to set an example for commercial and amateur sample providers. So, we decided to use the phrase

[6] Jon Pareles "*For Old Rhythm-and-Blues, Respect and Reparations*" *New York Times*, March 1, 1997 http://ur1.ca/fduq

[7] Hyde *The Gift* 1979

[8] Lessig *REMIX Making Art and Commerce Thrive in the Hybrid Economy* 2008

[9] John Buckman "What is 'Open Music'?"
http://ur1.ca/fdut

[10] Hyde *The Gift* pg. 85

[11] "All Fruity, No Loops: FL Studio to Remove All Melodic Samples; Murky License, Content" by Peter Kirn
http://ur1.ca/fdvi

"CC Sample Pool" to refer to the world wide collection of music available for sharing and remixing and position ccMixter as just another player contributing to the Pool. (If you are familiar with CC licences then you can think of the Pool as the subset of the Commons that includes all audio samples licensed without the NoDerivs clause.) The Pool, we tell musicians, is a safe harbour since, by definition, all the samples are provided under a well understood, liberal, licensing scheme.

Other sites, such as the freesound project[12] from the University of Barcelona, have since sprung up providing sound designers a CC platform to share their work.

In order to further promote the idea that ccMixter was just a small part of a larger ecology, we published a developers' interface[13] to allow disparate Sample Pool sites to communicate with each to share their catalogues of samples. ccMixter currently uses this API to give remixers an easy way to attribute samples they have used from other websites such as freesound and Magnatune.com.

9.4.1 Innovation Fodder and the Unexpected Collaboration

Providing a legal safe harbour is only the first implication of an ever growing Pool. Over the course of the project, it became clear the Pool was indicating a special breed of creativity.

When musicians work alone they are limited by their own technical skills or sample libraries they have purchased. When contracting musicians for a recording session, the project is limited by budget constraints and the skills of the hired musicians. When collaborating with friends or band mates, the results are limited by the collective skills of the band, typically three to five people.

Compare those limitations to a pool in which millions of samples are available for sharing and sampling. An unlimited number of genres, styles and playing techniques. Instead of placing an advertisement in craigslist for a bass player, musicians can now search the Sample Pool for a huge variety of bass samples. No more worrying about being restricted by the skills of your collaborators, no more waiting for someone else to finish their parts and, best of all, no more hurt feelings when you are not satisfied with a part submission.

By removing restrictions of skill sets, time pressure and personality, the CC Sample Pool has enabled the most exciting development on ccMixter: the unex-

[12] http://ur1.ca/fduv

[13] "Sample Pools" Creative Commons developer wiki. http://ur1.ca/fduw

pected collaboration. Consistently, a musician or singer would upload a sample or a cappella with their own frame of reference and inspiration. Some period of time would pass, sometimes a year or more, and a remixer would pluck the sample or 'pell from the site and use it in a completely unexpected context, sometimes (and this is the exhilarating part) surprising the remixer.

A work of art can be considered creative when familiar elements are combined in an unfamiliar and therefore unanticipated context. The CC Sample Pool has turned out to be a factory for just this kind of re-combination, because when browsing the Sample Pool with an open mind, the remixer is bound to be inspired in ways previously unconsidered. The remixer may have his personal history and training to reference, the Pool has no such limitations.

I could relate to this idea when ccMixter founders Neeru Pahria and Lucas Gonze talked me through this four years ago, but watching it happen as a matter of course has been a revelation.

The inspiration does not stop at the remixer. Lessig relays the story of SilviaO[14], a singer who uploaded a Spanish a cappella that I remixed. I am not fluent in either Spanish or the Latin rhythms she was imagining when singing the song. When I heard the a cappella, I was inspired by the potential for a lilting, funky jazz accompaniment and I proceeded to mangle the vocal part into nonsensical Spanish on my way to my arrangement. She later remarked to Lessig that she realized she was "just a little part of the huge process that was going on now with this kind of creation".

9.5 Attribution Tree

In late 2008, as I was preparing to speak at FSCONS. I turned to the ccMixter community forums to ask a question, the premise of which postulated a scenario in which a musician would turn a sample over to the Public Domain, not expecting any money or credit in return. This was the premise, mind you, not even the real question. The thread was immediately derailed and got stuck, repeatedly, on the idea of passing a creation into the PD.

I was reminded, as I had been so many times in the course of my activism for CC, that musicians are a traumatized lot. Understandable after 100 years of taking a beating by your own industry that holds out, as its highest attainable goal,

[14]Lessig *REMIX* pg. 17

a Faustian "loan sharking"[15] lottery (A.K.A. record deal) that if, heaven forbid, you actually win, gives you the chance to relinquish all rights to your music for life with the privilege of paying for every expense along the way.

The idea that a musician would voluntarily give away attribution was very, very confusing to many participating in that forum thread. Don't forget we are talking about musicians who had each put hours of music into the Commons, hardly neophytes to the sharing economy. But mess with attribution and a line has been crossed. As it was later pointed out to me at the conference, this attitude is not unlike academic publishing where credit is *currency*.

Lucky for me, ccMixter has the most thorough attribution scheme we could conjure. If it didn't, I'd be furiously coding it instead of writing this document or risk being hung by my thumbs by the ccMixter community. Every remix listing on the site includes a section that points to its sources.

Here's the attribution section for a song called "Coast2Coast (We Move mix)" by an artist named duckett:

> **Uses samples from:**
> Coast to Coast by J.Lang
> Mellow Dm 5ths by Caleb Charles
> 1165_walkerbelm by dplante

The first listing shows that duckett used an a cappella uploaded by J. Lang called "Coast to Coast". If we click on that song title we are taken to the details page for the a cappella. There we can see all the places where the a cappella has been sampled:

> **Samples are used in:**
> coast to coast-D... by deutscheuns
> Coast to coast (... by alberto
> Coast 2 Coast (j... by ASHWAN
> Coast 2 Coast (A... by Dex Aquaire...
> My Name is Geoff by fourstones
> Reminisce Coast by teru
> Coast To Coast by ThomasJT

[15] Fake Steve Jobs "The music industry nobs have finally figured out what we're doing" July 4, 2007
http://ur1.ca/fduy

One Night Stand . . . by CptCrunch
c2c2c by fourstones
Let Me Know by KatazTrophee
coast to coast by kristian v. . .
Coast2Coast (We Move Mix) by duckett

We can see duckett's remix here at the bottom.

Through the use of the Sample Pool API and a blog-style trackback system we extended these links beyond ccMixter and point to other members of the Sample Pool, videos on hosting sites like YouTube and Flickr, podcasts and any other reference to the music.

It became clear that many ccMixter musicians consider the people they sample as benefactors and attribution as a reciprocal currency. As I learned from my experience while preparing for the conference, the justice implied in properly crediting your benefactors is a reactionary passion amongst ccMixter musicians. But, I claim the attribution tree demonstrates something even more powerful.

Exposing a piece of music's roots takes the shine off the ex *nihilo* mythology that fosters an image of the musician working alone in his head to create his masterpiece without the assistance of mere mortals. This image is what corporate marketing revels in and how many musicians, fuelled by a bubble of sycophancy, see themselves. The ccMixter attribution scheme is a statement about how art really works, everybody building on each other.

The attribution tree is what I mean when I say we've turned the artistic process inside out - instead of hiding our tracks in the hopes of being considered "great" individual composers, we make attribution the focus of the enterprise and build reputation on who is sampling and who has been sampled the most. Derivation and re-use is the generous, creative spirit incarnate. The attribution tree is the accounting book of a gift economy.

9.6 A Capellas

If we ever get around to making ccMixter T-shirts, they will read: "*Came for the a cappellas, stayed for the sharing economy.*"

Nothing attracts talented musicians like the chance to work with a strong vocalist. And nothing attracts good singers like the chance to work with an inspired

producer. This mutual attraction is true for traditional recording sessions as well as for remixing communities. When the Creative Commons staff showed me a prototype of ccMixter, my first suggestion was to add a section specifically for a cappellas. I felt very strongly that in order to bring legitimacy to CC in the music world they would have to substantially increase the quality of the CC music and a good crop of a cappellas was the key to make that happen.

9.6.1 Why (Free) Music Doesn't Suck Any More

A cappellas, indeed, have become the fuel for what makes the site work. They ensure an overall aesthetic quality and that alone continues to make ccMixter relevant to musicians. More than a few of the best remixers have made it clear it was the great 'pells that attracted them in the first place.

For the rest of us, the less-than-best remixers on the site, the effect is profound. You might enjoy a fourstones instrumental remix - or you might not. The nice thing for me is that I can add Silvia's voice to it without taking a chance she's having a bad day during an explicit collaboration. I can hear her fantastic vocal performance as it sits in the Pool. Here's the real kicker: by collaborating with Silvia in this way, you think better of fourstones music because, in fact, my sound is better with her vocals than without. This is important to note because it was not the cause of CC that hooked the best musicians (who never heard of Lawrence Lessig and still have not visited the Creative Commons Web site) into the open content world, it was the chance to share in a pool of high quality stems[16] and 'pells, a chance to improve their sound.

An awakening is triggered in the musician when you add frictionless access to the 'pells, a disassociation from commercial enterprise and a model where musicians retain ownership of their work. As their remix is picked up by a YouTube video or podcast (both of which we track on ccMixter) more lights start to come on. Finally, they start to notice a relationship between the gift economy and their own artistic process. As I have witnessed many times in the last four years, this relationship is what produces a fundamental shift in the musicians' understanding of what is possible with reforms in ownership, attribution and sharing.

[16] In music production a "stem" is the isolated recording of a single instrument.

9.6.2 The Pros vs. The Artists

Lessig divides the motivation of participants in a sharing economy into "me-regarding" and "thee-regarding.[17]" Playing softball on a Saturday afternoon in Central Park against a rival law firm is a me motivation. Ladling soup in a homeless shelter on a Sunday afternoon is thee motivation.

The relationship I describe between the remixers and 'pells above is classic me motivation. ccMixter provides a service to remixers by giving them access to fantastic singers without any more effort than browsing the a cappellas section of the site. Putting the remix into the Commons is seen as a small payback for the chance to work with a premier vocalist that actually, you know, sings in key.

Roughly two and a half years into the project ccMixter started attracting a new kind of musician: the professional producer. When they first arrived, they were far less adventurous than the remix artists we were used to, but their productions were so well put together and slick (in a good way) that it was a treat to have them on board. Rather than take a 'pell into a deep, personal artistic place, they were expert at pleasing the customer. What I mean by that is that they would create perfectly executed "straight up" productions around a 'pell that succinctly matched what the singer had in mind, regardless of genre.

Many of these producers had come from another remix site, one which operated under an "All Rights Reserved" model. After a while at ccMixter however, a transformation had been noted. More than a year after they moved over, one long-time observer, a fellow remixer, noted in a review:

> "It's been a year of surprise from people like you and [others] who I thought I had neatly categorized [at the other site] into a style and who have brought new things seemingly out of the blue[18]."

Out of the Pool, actually. This is a snapshot of an artist half-way through the realization of what is enabling a newly found sense of adventure and innovation.

The surprising thing to me about the professionals was their initial attitude toward the 'pells. It took me a while (and several Victor-schooling, pointed email exchanges) to figure out what was going on and even longer to build an honest appreciation for it. You see, when you're a professional producer at the top of your game the last thing you're starving for is a decent singer. Great singers will pay

[17] Lessig *REMIX* pg. 151

[18] ccMixter artist collab, in reply to a review of his remix "Beautiful People" http://ur1.ca/fduz

you to work with them, that is how you make your living after all. It shouldn't be surprising in this context that the pros see their remixes as the gift. They are providing their services to these singers (and incidentally to the Commons) *pro bono*. Classic thee motivation. The rest of us are all playing softball, these guys are handing out delicious free soup.

And thank heaven for their gifts (and their patience with me) because just by showing up they brought more than just great music, they were giving mainstream credibility to the entire open music movement.

9.7 Licenses

Creative Commons exists to give artists a way to signify, through a set of ready-made licences, what can and can not be done with works posted to the Internet. A full explanation of CC and the licences is beyond the scope of this document but clearly it is a cause I consider worthy.

The popularity of the CC brand adds to the power of the licences - the more people know what the brand means the less questions, the more legal sharing and reuse, the richer the culture. The potential downside of that popularity is that more people are likely to make bad assumptions about what the brand actually means in legal terms. For example, there is a range of permissions between the individual CC licences and there is a non-zero learning curve on recognizing which of those permissions apply to a piece of art with a given CC licence.

At the risk of perpetuating the (wrong) meme that the CC brand simply means "do what you want", I thought it was essential to create an environment at ccMixter that worked within the CC domain, but still gave the remixers safe haven from legal worries. I wanted to put the best possible face on the licences that I could credibly get away with presenting. Is that spin? I hope not. Either way, this goal turned out to be laced with challenges. Worth every effort, but laced nonetheless.

9.7.1 The Sampling Licences

An important element of the roll-out for the CC/WIRED contest was a new family of CC licences aimed specifically at sampling and remixers. I won't go into the history of these licences but mistakes were made and lessons were learned.

My mistake was ignoring public calls from CC to join the discussion during the drafting of these licences in the summer of 2004. I figured this was "legal stuff" and everybody knew what they were doing and had the best intentions. All that

was correct but I should have made my opinions heard before and not after. Had I been a better CC citizen, I could have avoided a lot of grief later, after the site opened, after I realized what these licences really meant. My involvement might not have made a whit of a difference in the drafting phase, but at least I would have been better prepared.

A few months after the launch of ccMixter, I had come to a bitter conclusion. The Sampling family of licences had restrictions and requirements that I came to believe were doing more harm than good to the cause of demonstrating reuse. Audio samples with these licences were legally incompatible with audio samples licensed under other CC licences. Even worse, remixes with a Sampling licence could not be used as video soundtracks - not even in amateur YouTube-style videos. I was concerned that we could not credibly claim to be the "sane" alternative to an "All Rights Reserved" model under these conditions.

I made my case to CC staff and they agreed to discontinue supporting the Sampling licences on ccMixter and green-lit a "re-license" campaign on the site that gave musicians a chance to remove the Sampling licences where legally feasible.

Since then, CC came under fire for having too many licence options, confusing potential adopters and support was dropped for one of the lesser used Sampling licences. The others still exist as options in the CC licence chooser but have a much lower profile than in November 2004.

9.7.2 ShareAlike

We settled on supporting two licences commonly known as: Attribution and NonCommercial for new uploads. That means a musician posting original samples and a cappellas could say "copy or remix my sample in any context, even in a commercial project" (Attribution) or "copy or remix my sample, but if you use it in a commercial project you need to contact me first so we can work something out" (NonCommercial). Both licences require giving credit to the musician you sample.

If someone does use a sample with one of these licences in a remix, they are under no obligation to license the remix under a Creative Commons licence. This is great when it comes to choice and freedom, but it's not optimal when you're trying to spread CC.

There is another licence feature that would force the remixer to license the track under CC, it's called ShareAlike. We could have offered ShareAlike and NonCommercial-ShareAlike on ccMixter as two more options. The problem is that ShareAlike is not combinable with the non-ShareAlike version of NonCommercial.

Eyes glazed over? No kidding.

Here's what that means. Joe the remixer wants to use two samples from the Pool in his remix. One sample is licensed under NonCommercial, the other is ShareAlike. In order to do so legally he would have to get permission from the person that uploaded the ShareAlike sample. If he didn't get permission he would be in exactly the same boat as if he had sampled a Michael Jackson record: copyright violation.

At this point, I was facing a serious dilemma. On one hand, I would love to encourage CC licence adoption by using the ShareAlike licence. On the other hand, the last thing I want to do is enable musicians to post copyright violated remixes to ccMixter simply by having the wrong combination of CC samples.

I didn't ruminate too long on this one because I quickly decided it was more important to have a totally "safe" environment where any two samples could be mixed together legally. I had a nightmare scenario of a producer spending weeks on a remix using samples they had downloaded exclusively from ccMixter only to find out they were in violation of the law. I wanted to give musicians *some* hope.

The real issue here is the NonCommercial licence which is very popular and drives adoption of CC, but has been problematic. I can't speak for how CC deals with the rest of the world but in my experience, when I have a problem it is met with transparency, an appreciation for honesty and a healthy distaste for false sacred cows. Consequently, I'm happy to report there is currently a major re-think under way regarding the NonCommercial licences with lots of help from the community and academia. This time, I let my feelings be known. You should too[19].

9.7.3 Licences for Remixes

As matter of policy on ccMixter, to simplify things for musicians, no remix can specify a CC licence. Instead, you "inherit" the most restrictive licence from the samples you use. For example, if you use two samples where one has the Attribution licence and the other has the NonCommercial licence, then your remix will be posted under a NonCommercial licence because that one is considered "stricter".

[19]CC Wiki "NonCommercial" discussion page
http://ur1.ca/fdv0

9.7.4 The Heavy Breathing Factor

Creative Commons attracts a lot of academics who are eager to mine ccMixter's data that we've collected over the years. The most common things they are looking for are patterns of behaviour with respect to the CC licences. Understanding this behaviour and how to increase the musician's awareness of their choices is important to the future viability of CC licences. We are happy to oblige and make all of the internal database tables - minus user Internet connection IDs, emails and passwords - to just about anybody that asks. And we get asked a lot, especially around doctorate season.

Unfortunately, decisions involved in making music are emotional, based on aural proclivities and none of that is captured in ccMixter's internal database tables, even as scientists do their best on semantic audio profiling tools[20].

For example, we don't track the gender of the singer or remixer. Yet, the primary demographic of ccMixter remixers is a male. How do I know? Below is a chart of the top 12 most remixed a cappellas[21]. Note the gender proclivity (I added the last column manually):

upload	artist	#remixed	gender
Ophelia's Song	musetta	64	F
Sunrise	shannonsongs	63	F
Lies	trifonic	54	F
Matter of Time	shannonsongs	49	F
Girl and Superg	lisadb	48	F
Sooner Or Later	trifonic	46	F
Magic In Your E	Songboy3	43	M
Whatever(acappe	Tru_ski	42	M
September	calendargirl	42	F
Broken	trifonic	40	F
Freedom	snowflake	36	F
We Are In Love	shannonsongs	36	F

A further look at the data reveals that it typically takes a male singer or rapper roughly twice as long, at twice the uploading pace, to reach the same number of remixes as his female counterpart.

[20] "Integration of Knowledge, Semantics and Digital Media Technology, 2005. EWIMT 2005. The 2nd European Workshop"
http://ur1.ca/fdv1

[21] As of December 28th, 2008 and excluding those related to remix contests.

The preference seems to go further than mere gender, and this is where simply mining the data as numeric values completely breaks down. All of the female a cappellas in that chart can be said to share the same vocal style. The performances could be called laid-back, cool, breathy. If I were a less enlightened person I would say they sound, in a word: sexy.

We have had uploads by a few women that have a stronger, more dramatic vocal style. These are fantastic singers who could really belt out a melody, American Idol-style. Yet, they completely fizzled on ccMixter, with barely a remix, and of those, many were pretty terrible. This is not a reflection on the singer. Again, these are truly gifted vocalists who simply are not to the personal taste or don't fit the harmonic profile of the better remixers on our site[22].

Regarding which source material to use, the conclusion I've come to is that liberal licences are less about choice and more about enabling. The decision whether to use a specific piece of music or not is based on the content. If it's available without legal strings attached all the better - but the decision rarely starts with a licence agreement. This is clearly the case in a non-commercial environment like ccMixter, but art is what comes first to an artist - the rest is back-fill.

9.8 What's Missing: Open Payment Protocol

More crossover between the sharing economy and the commercial economy, as in a list of Hollywood credits, would certainly provide potential business partners with the "recognition of success"[23]. Allowing contact information to atrophy, as so often happens on the Web, and thereby ignoring email inquiries to license music for money, is not optimal for achieving that end.

One possibility would be to create a mechanism to funnel money to the artist (and all the artists that artist sampled) cleanly and automatically. If I post a remix that gets licensed for money, I expect everybody I sampled would get paid automatically, even when the sample was posted on another site.

Personally I would hate to see the actual royalty payment system turn into a proprietary, competitive marketplace. From a musician's perspective I want music hosting sites to add value on top of an established, open protocol between sites.

[22] Victor Stone - Virtual Turntable blog "My (Throwing) Muse" Blog entry in which I discuss a kind of mismatch between a remixer and singer that may be attributed to clashes in the harmonics of a singer's voice and bedding the remixer typically users.
http://ur1.ca/fdv3

[23] Lessig *REMIX* pg. 221

The ccMixter attribution tree and the Sample Pool API serves as a non-commercial skeleton today but could be expanded, perhaps with CC+ technology[24], to include a royalty pipeline between artists, even when they host music on different sites. The tools for royalty payments can be made as transparent as simple attribution - in the case of ccMixter that's done by picking the sources from a search result list.

The type of features that would be needed on all commercial music hosting sites includes:

1. A way to automate payment to an artist such as a PayPal(tm) account.
2. A choice of pricing schemes that allows someone posting an a cappella or sample to set a price for different scenarios of usage. For example: Free for schools, $10 for short videos, $100 for films, etc. I would even be interested in an "expiration price". This says: if you can't reach me through the means I supply within XX days, then the price is XX amount (including zero).
3. A marking on every a cappella or sample that signified it has been "cleared" - meaning it is either free to use in a commercial context through an Attribution licence or there is a clearly marked price (depending on scenario) and a way to make payment on it.
4. A remixer can set the price(s) for his own remix but the total fee for the remix will include royalty payments for the artists he sampled.
5. Payment would be posted to the site and distributed automatically to the remixer and everybody sampled including, through the royalty pipeline, artists on other sites.

Again, it would be a mistake to make this payment system part of a proprietary competition between businesses. Music hosting has plenty of areas to compete in for value-added services. Like effectively soliciting for licences.

[24] CC Wiki "CCPlus"
http://ur1.ca/fdv4

Denis Jaromil Rojo

10

The Weaver Birds

10.1 Hackers spinning the Dharma wheel

You are welcome to join the new wheel spin of our history.

This document is an open (in fieri) **Magna Carta Libertatum**: A programmatic, visionary and inclusive document to reclaim the space for the GNU generations, proposing a plan to be shared that is already being shared by many.

The dyne.org hackers network has become eight years old this year. Of course, this text does not just talk about "us". Being an open network, we include multiple contexts around the world with which we share mutual help; as with our free software development activity and the sharing of on-line and on-site spaces. This document talks about our dreams, which are slowly but steadily becoming reality.

For all this we are infinitely grateful to the GNU Project[1], that let us discover how to get hold of knowledge, take control of the architecture we live in and start building a new planet :)

[1] See http://ur1.ca/f6o9

10.2 Dharma youth

> *The only people for me are the mad ones, the ones who are mad to live, mad to talk, mad to be saved, desirous of everything at the same time, the ones who never yawn or say a commonplace thing, but burn, burn, burn, like fabulous yellow roman candles exploding like spiders across the stars.* (Jack Kerouac, Dharma Bums)

First let us declare who we are: After eight years, we are able to trace a common denominator among the people active in our network, interconnected by a nomadic approach to development and life.

We are young dreamers. We often like to stir limitations and invent different models by which to learn, communicate, share and live differently to those proposed by the societies where we are caged. We have in common that we survived out of the commonplaces, we cultivated our thoughts and sharing methods, knowledge and tools, keeping them out of any box.

This is the time in our history in which we will speak with young voices, as we are taking some crucial steps on which we will base our architectures, hopefully mixing the inner with the outer, the Ying with the Yang.

Some of us are nomads, some settle in different places from time to time, some live in the same marginal neighbourhoods of the world where they were born, some are working for multinational IT companies, some are riding bicycles all around the world, some are lecturing in schools, some are living in the wilderness, some are exhibiting in art galleries and some are squatting houses. And yes, you are probably one of these, or you have been in contact with us at least once.

What we are proposing here is a new model, as we acquire a practical vision to develop it in harmony with our different environments.

Please continue reading if you like to discover why and how.

10.3 Freedom of Creativity

> *The growth of the network rendered the non-propertarian alternative even more practical. What scholarly and popular writing alike denominate as a thing ("the Internet") is actually the name of a social condition: the fact that everyone in the network society is connected directly, without intermediation, to everyone else. The global interconnection of networks eliminated the bottleneck that had required*

> *a centralized software manufacturer to rationalize and distribute the outcome of individual innovation in the era of the mainframe.* (Eben Moglen)

Free (as in "libre") software is, when referring to the original principles endorsed by the Free Software Foundation[2] (FSF), a new model for distribution, development and marketing of immaterial goods. While recommending you to look at the philosophy pages published by the FSF, we will highlight some implications which are most important for us, by motivating our activities and enabling them.

Free software implies a distribution model based on collaboration instead of competition, fitting in the fields of academic research where sharing of knowledge is fundamental and where the joint efforts of different developers can be better sustained when distributed across various nodes. In this regard we quote John Nash (Nobel in 1994) saying that “the best result will come from everybody in the group doing what is best for himself, and the group”.

Imagine then that all creations reproduced in this way can also be sold freely by anyone in each context. This opens up a horizon of new business models that are local, thus avoiding globalised exploitation, but share a global pool of knowledge useful to everyone.

Furthermore, in the fields of education we believe that independence from commercial influences is crucial in order to empower students with a knowledge that they really own.

We want to liberate our minds and the minds of the ones who will come.

> Here is where the difference between free software and open source starts to matter. Open source focuses on new models for development. Free software is not interested in how the program is developed. We are interested in the ethics of how the program is distributed. (Richard M. Stallman)

10.4 No nationhood

> *Per far che i secoli tacciano di quel Trattato*[3] *che trafficò la mia patria, insospettì le nazioni e scemò dignità al tuo nome.* (A Bonaparte liberatore, Ugo Foscolo, 1778-1827)

[2] see http://ur1.ca/f6ob

[3] Trattato di Campoformio

One Planet, One Nation (Public Enemy)

Our homelands are displaced, are sometimes very different, sometimes difficult to be put in contact with due to the boundaries given by nations. In fact we think that nation states should come to an end, for the borders they impose are not matching our aspirations and current abilities to relate to each other.

During the few years of our lives we have been taught to interact and describe ourselves within national schemes, but the only real boundaries are the differences between our languages, which boundaries we have learned to cross.

From our national histories we mostly inherited fears and hunger. But with this network we have learned how to bury them, as they do not belong to us any more. What is left is a just a problem that can be solved: we will stop representing us as part of different nations. Even if we could, we do not intend to build our own nation, nor propose a new social contract, but rather to cross all of these borders as a unique networked planet, to start a new cartography.

We have a planet! And it is young enough to heal the scars left by the last centuries of war, imperialism, colonisation and prevarication that left most people cultivating differences and fake identities, represented by flags and nationalist propaganda.

We aren't claiming to open the borders for the speculation of multinationals, since we are well aware this can be a rhetoric used by neo-liberist interests to tramp over the autonomy of developing countries. The contextual integrity[4] of different social ecosystems needs to be respected, but as of today, the national borders do not succeed in preserving it.

With some exceptions, most of the national programmes and cultural funds we agreed to work with were pretending each of us would dress in a flag, as we were recruited in a decadent game of national pride and competition, with an agenda of cultural, economical and physical domination. Tracing all our movements, they assimilated them to leviathans that were playing the last violent moves of a chess game in which we were just pawns.

This does not make sense to our generation any more. We refuse to identify with the governments holding our passports, especially since these governments now work for the mega-corporations that maintain their power over us. We look forward to relating to each other on the bases of dialogue and exchange, approaches

[4]see Nissenbaum, H, (2007) Contextual Integrity - http://ur1.ca/f6od

and architectures that can be imagined globally and developed locally in an open way like the channels that let us speak to you right now.

Therefore we declare **the end of nations**, as our generation is connected by a far more complicated intersection of wills, destinies and, most importantly, problems to be solved.

10.5 Networked cities

> *Creo que con el tiempo mereceremos no tener gobiernos.* (Jorge Luis Borges, 1899-1986)

Naturally, our cartography draws connections among nodes, hubs of intelligence that are closer in the cyber space than in the physical. In the last century we have learned how we can share music, lyrics, stories and images, and, for a few decades, we have been able to copy them without marginal costs across the whole world.

This lets us relate to each other with an outreach that is amplified by the density of our living environments: the urban spaces that somehow offer enough gaps for our agency. Those who pretend to govern our living are now busy in controlling those voids, while every tree in a public square represents an obstacle for their cameras, omnipresent eyes patronising our evolution.

We found shelter in the ancestral practices of trance[5], opening the doors of our perception to the unknown, resonating our own bones, enhancing the agility of our tongues to follow the hip-hop flow of radical thoughts, skating over the universe in which we are constrained, painting fantasy over the imposed walls of our cities, jumping higher to join the loose ends of our parkas.

These practices are now common in all of our cities[6], seeded by our own need to evolve, to influence a governance that doesn't listen to us. Some kids turn into a dark army of vengeance, some lose the faith in future, some fall in the virtual loopholes offered by the magnetic startups of the dot.com boom. We need to offer ourselves an alternative to this hopeless conflict and the first step is to build a narrative that respects all choices, that does not neglect sufferance.

All this creativity and despair is shared among our cities, stuffed by unnecessary needs and mirages of success of the "creative industries", while we already

[5]Lapassade, G. (1976) Essai sur la transe, Éditions universitaires

[6]De Jong, A, Schuilenburg, M. (2006) Mediapolis. Popular culture and the city, Rotterdam: 010-Publishers

elaborate a concentric vision that is linked to the density of our lives and the cultural flow of our errant knowledge.

Therefore we declare the birth of a **planet of networked cities**[7], spiral architectures of living swirling above our heads and across our fingers, as they evolve in a common practice of displacement and re-conjunction, joining the loose ends of our future.

Our plan is simple and our project is already in motion. In fact, if you look around yourself, you will already find us close. While the current economical and political systems face the difficulty of hiding their own incoherence, we are able to implement their principles better and, most importantly, we are elaborating new ones.

We are reclaiming the infrastructures, the liberty to adapt them to our needs, our right to property without strings attached, the freedom to confront ideas without any manipulative mediation, peer to peer, face to face, city to city, human to human.

The possibility of growing local communities and economies, eliminating globalised monopolies, and living up from our own creations, is there. We are filling the empty spaces left in our own cities, we are setting our own desires and are collectively able to satisfy them.

Furthermore, some of us are seeking contacts with the lower strata of societies, to share a growing autonomy: as much as they are excluded by the society they serve, that much they are closer to freedom, while it is clear that autonomy is the solution to present crisis. These marginal communities were the villagers who, mostly because of rural poverty, could no longer survive on agriculture, as well the migrants and refugees who had to escape their birth places, or who never had a homeland. They came to the city and they found neither work nor shelter. They created their own jobs out of the cynical logics of capitalism, mostly in refuse recycling. They look ugly to the minorities in power, while most architects and urban planners unjustly call their shelters "illegal settlements". Some of them they organise to gain power with solidarity, and those are the squatters.

During the past decades we have learned to enhance our own autonomy in the urban contexts[8], diving across the different contexts composing the cities, disclosing the inner structures of their closed networks, developing a different texture made of relationships that no company can buy.

[7] Batten, D.F. (1995), Network Cities: Creative Urban Agglomerations for the 21st Century, SAGE

[8] Lapassade, G. (1971), L'Autogestion pédagogique, Gauthiers-Villars

We are the **Weaver Birds**, burung-burung manyar[9], we share our nests in a network, we flow as the river of the spontaneous settlement of Code in Yogyakarta[10], the gypsy neighbourhood of Sulukule in Instanbul, the Chaos Computer Club, all the hacklabs across the world, the self-organised squatters in Amsterdam, Berlin, Barcelona and more, the hideouts of 2600 and all the other temporary hacker spaces where our future, and your future, is being homebrewed.

This document is just the start for a new course, revealing an analysis that is shared among a growing number of young hackers and artists, nourished by their autonomy and knowledge. Our hacker spaces are quickly proliferating as we do notneed to build more space as opposed to penetrating existing empty space. We are highly adaptive and we aim at connecting rather than separating, at being inclusive rather than exclusive, at being effective rather than acquiring status.

10.6 Horizontal media

> *Whoever controls the media -the images- controls the culture.* (Allen Ginsberg, 1926-1997)

Our concern about freedom in media is serious. The current urgency justifies all our acts of rebellion, as they have become necessary. One of our main activities is patiently weaving the threads for open networks that put us all in contact. But greedy national regimes and criminal organisations threaten us as if they can avoid revealing their fascist nature, while opportunist provokers use our open grounds, as if they had been granted the right to offend and generate more wars.

About media we certainly accumulated enough knowledge to trace a clear path for our development, as we have been doing since the early days of our existence. We are active in implementing the liberties that the digital age grants us. This intellectual freedom is very important for the development of humanity, for its capacity to analyse its own actions, to weave its faith in harmony.

[9] Burung-Burung Manyar means "Weaver Birds" in bahasa indonesia, is a book by Romo Mengun published in 1992 by Gramedia (Jakarta)

[10] the Code riverbank was considered an “illegal settlement” of squatters, while Romo Mengun has been active between 1981 and 1986, gathering the sympathy of intellectuals believing that these poor members of society should be accepted and helped to improve their living conditions. The government of Indonesia planned its forced removal in 1983, but as protests followed the plans were cancelled. Nine years later in 1992 Kampung Code was selected as the winner of the Aga Khan Award for Architecture in the Muslim World. The Code riverside settlement continues to exist until this day, as a remarkable example of urban architecture.

Our plan is to keep on developing more on-site and on-line public space for discussion, following a **decentralised pattern** that grants access to most people on our planet. We created tools for independent media, in order to multiply the voices in protection of common visions, to avoid a few media tycoons taking over democracies, as is happening in many different places of the world.

We are aware of the limits of the present implementation of democracy: while they are busy celebrating their own success over archaic regimes, these systems stopped updating their own architecture and have fallen in control of new enemies which they now cannot even recognise.

The solution we propose is simple: maximise the possibilities to recycle existing media infrastructures, open as many channels as possible, free the airwaves, let communication flow in its multiplicity, avoid any mono-directional use of it, give everyone the possibility to run a radio or TV station for its own digital and physical neighbours, following an organic pattern that will modularise the sharing of sense and let ideas propagate in a horizontal, non- hierarchical way.

If these media architectures are linked with educational models that foster tolerance we have a hope that they will accelerate the evolution of our planet and grant protection to the minorities that are populating it.

10.7 Freedom of identity

We believe that current governmental efforts of biometric control by governments, private data mining operated by companies and public schools watching over students' activity, profiling programmes that are targeting people worldwide are crimes against humanity.

Each of those efforts is not taking into careful consideration what can be done when dictatorial regimes take control of such systems. In fact, this already happened half a century ago when the first action of the Nazis was numbering people and labelling them with a symbol marking their biological ethnicities (as biometry can nowadays).

Conscious of the lack of responsibility of current governments worldwide, we will oppose with all means necessary their efforts to number and control all people in the name of a safe and unreachable security that, as we hackers can demonstrate, cannot be enforced by such means.

As hackers we are very conscious of information flows and how several leaks in the digital domain are actually disclosing personal information of large amounts of

people worldwide. We believe that people should not be numbered and included in databases, which probably is what still differentiates governments from operating systems, merely suppressing the processes that are not optimised for their tasks.

Our generation includes a large critical mass concerned on these issues, as proof, see the recent success of *Freedom not Fear*[11], while an entertaining and poetical description of our feelings is also depicted in the movie Gattaca[12].

10.8 Education

> *Because this New Order of ours is a military order, an authoritarian order, commando style, there is no education. There is only instruction, a mere taming experience.* (*Romo Mangun*)

As privatisation of educational structures progresses, the academy assumes a corporate and business mindset, which assists a shift of the educational mission in society from *inclusive* to *exclusive*.

The influential play of industries has permeated most academical disciplines, in particular regarding the adoption of technologies. The choice of educators has become biased by logics of short term profit, rather than **Solid Knowledge**.

On the other hand, notions are rapidly becoming universally available. *Heuristic*, *maieutic* and *infrastructure* functions provided by academies are best satisfied by the global action of the free software communities' **horizontal** sharing methods, experiences and working implementations, on distributed and versioned R&D platforms.

As components can be combined and redistributed, copied and modified[13] students learn a knowledge that is durable, without restrictions on their rights to produce and redistribute creations. This situation will provide an advantage for new generations, as it does for developing countries.

Media hubs and hacker spaces constitute a great potential to activate cultural growth, fulfilling an educational role that is progressively lacking in higher schools and universities.

[11] Worldwide protests against surveillance, every 12 October - http://ur1.ca/f6og

[12] 1997, Directed by Andrew Niccol. With Ethan Hawke, Uma Thurman, Gore Vidal - http://ur1.ca/f6oh

[13] following the GNU project philosophy and further applying to more fields of human knowledge.

In 1998, during the first edition of the hackmeeting[14] in Firenze, its assembly launched the idea of *independent universities of hacking*, spawning numerous hacklabs across the networked cities, with annual meetings that have been taking place until today in various places in the south of Europe. We believe the results of these initiatives have been greatly influential for our own cultural and technical development, as they hosted an errant knowledge otherwise dispersed and neglected by the academies, with the participation of people like Wau Holland, Richard Stallman, Tetsuo Kogawa, Andy Muller-Magoon, Emmanuel Goldstein and even more collectives and individuals.

With such a short but intense history behind us we are well motivated to continue developing our independent paths of knowledge, an auto-didactic literature that liberates the students from corporate interests and opens up a horizon of variety and creativity that cannot be envisioned by the most advanced, yet faulty, implementations of the so called “creative industries”.

10.9 Consolidation

> *Inverno. Come un seme il mio animo ha bisogno del lavoro nascosto di questa stagione.* (Giuseppe Ungaretti, 1888-1970)

If you have read this far, and you think our plans deserve support, then you should know that we are really struggling for better quality, a part of our vision we haven’t fully reached yet. That is what we call consolidation.

As our activity mostly focuses on free and open source software development, we have to admit that we are not yet there, in satisfying all the needs of the various communities relying on them.

For example, the on-line radio streaming software MuSE[15], being developed for eight years now, to provide a user friendly tool for community on-line radio streaming, and used by various radios worldwide, is not yet fully developed to the point it should, and we have a hard time in keeping the pace with updating it.

[14] see `http://ur1.ca/f6oi` and the book Networking Art `http://ur1.ca/f6oj` (Costa & Nolan)
ISBN:88-7437-047-4 ISBN:978-88-7437-047-4

[15] see `http://ur1.ca/f6ok` - a tool that is well documented for usage by the flossmanuals project at `http://ur1.ca/f6ol`

Another example is the popular GNU/Linux multimedia liveCD dyne:bolic[16] which has been developed since 2001 and reached version 2.5.2 last Winter. It focuses on several important issues, such as supporting old hardware, implementing privacy for users, offering media production tools and providing all development tools on its single liveCD. We won't hide that we are experiencing major problems in keeping the project alive, lacking funds to involve more developers for such a huge effort. In fact, since more recent "philanthropic" startups (that, considering the nature of their funding, are not grassroot at all) obscured our long-standing grassroot development, we have been deprived of the media attention that is also necessary to gather support. This all follows the logic of the big fish eating the smaller fishes, killing variety even in the open source context.

Yet another example is the FreeJ vision mixer software[17] which has been developed since 2002, implementing an open platform for producing and broadcasting audio/video online in a completely open way, also relying on development done by the xiph.org foundation[18]. With FreeJ we hope to rehabilitate the vast knowledge about the javascript language with a tool that lets it be used for video production, as a 100% free alternative to Flash and other recent commercial startups. The horizon for this project is very promising, as Ogg/Vorbis/Theora support is finally being natively integrated in Mozilla Firefox[19], and we are actively seeking funding support for a short term development sprint, which never really arrives.

In economic terms all these projects have been developed with very little support so far, and actually don't need much to go on. Still, proper expertise is needed and that, in most cases, requires a budget to keep people committed on a medium or long term.

What we are seeking for our consolidation is to develop a publication platform that lets us modestly merchandise these products, keeping them still free and available online, plus eventually some benefactors trusting our work and investing their philanthropic instincts in the visions hereby described. Suggestions regarding possible consolidation paths are very welcome and, of course, donations are needed[20].

[16] see http://ur1.ca/f6om - also listed among the few 100% free distribution by the Free Software Foundation, as well nominated among the top-10 open source projects in 2005 by the *Independent* UK.
[17] see http://ur1.ca/f6on
[18] see http://ur1.ca/f6op
[19] see http://ur1.ca/f6or
[20] see http://ur1.ca/f6os

10.10 Infrastructure

> *It is best to keep one's own organization intact; to crush the enemy's organization is only second best.* (Sun Tzu, 6th century BC)

We are planning (and realising already) a decentralised structure of on-line and on-site facilities to be independently shared among us.

On-site we successfully link to squats and liminal practices among our networked cities, developing patterns that can be implemented locally and shared globally. Re-use of existing empty structures is a crucial point, as it is keeping these initiatives independent from corporate and national influence, freeing the potential of the various cultures composing them.

On-line we are yet more powerful, having established a redundant network of servers and protocols that, even if opposed by corporate interests, are flourishing and well spread across the populace.

In this phase we are still very young and we need all your support to help us stay independent, host our efforts in different contexts and share their visibility.

As we have composed a comprehensive cartography of such efforts, you can be confident that all the economic and practical support contributed will be carefully shared by all nodes and documented by a growing literature of examples, facts and periodic reports which will keep all our network informed.

On site

So far we are emerging in two locations: the poetry hacklab[21] in Palazzolo Acreide, near Siracusa, where we are struggling to establish a museum of historical working computers[22] (also reachable online) as a permanent interactive exhibition where visitors can experiment with the machines, an educational effort that also implies the preservation of our digital past.

Second is our hacktive squatted community in Amsterdam, a city that is probably among the last places in the world tolerating the occupation of empty spaces, resulting in a balanced urban architecture that is open to independent cultural initiatives and grassroot social movements, helping to control the growing speculative trend on private properties by business magnates and criminals white-washing their money.

[21] see: http://ur1.ca/f6ot
[22] see: http://ur1.ca/f6ou

And next are even more grassroot run places ready to be emerging, with which we plan to share common plans about sustainability, open source practices and open spaces for the global and local communities crossing them.

On line

The network of servers we are so far relying on is very much resembling our on-site architecture, where hospitality plays a main role, as several independent organisations or institutions offered us hosting space for our projects, while half of the fleet is hosted on a limited number of commercial co-locations financed by self-taxation.

All software employed is free and open source: servers run stable versions of Debian GNU/Linux, code development is hosted using Git[23], webpages are served by a custom written setup (that we plan to evolve following this wheel spin) using Apache, PHP and Mysql, while whenever possible we use static pages. Open discussion forums are provided using Mailman, IRC and in future phpBB, while open publishing and editorial flows are hosted using the MoinMoin wiki platform. Most of our facilities are made redundant and, of course, we keep backups, having preserved so far every single bit composing our digital history.

Besides the dyne.org website itself, we host several artists and activists engaged in projects as Streamtime[24], Idiki[25], ib-arts[26], Morisena[27] and more, plus some free independent radios[28] and, in future, more TV, as software like FreeJ will soon be ready for it.

10.11 Collaboration

Nadie es patria. Todos lo somos. (Jorge Luis Borges, 1899-1986)

Thanks for reading this far. In case we sparked some interest in you with this document, then finally let us point out some practical ways to get involved and collaborate with us.

[23] fast and distributed code versioning system, see: http://ur1.ca/f6ow
[24] free blogging from Iraq, see http://ur1.ca/f6ox
[25] a wiki for ideas, see http://ur1.ca/f6oy
[26] ib_project for the arts, see http://ur1.ca/f6p0
[27] collaborative art, ecology, sustainability, summer camps, yoga, see: http://ur1.ca/f6p3
[28] see: http://ur1.ca/f6p4

Being still a young phase of our evolution, we need to carefully economise participation in our development. So we are looking for talented hackers wishing to contribute to software development, as well as independent communities wanting to join our network and amplify our practices and dreams across the world.

As we will hopefully get some funding (and this phase basically opens our network to such opportunities) we will not neglect to support your participation with money. In fact we plan to pay out fees for specific development tasks, as the ones described in the Consolidation chapter, which will be progressively detailed on our websites.

We also plan to open up residencies and remote stage programmes, in collaboration with educational institutions recognising our efforts and the involvement of their students in them.

Please get in touch[29], then! By specifying your email address, we will reply to your mail and plan our future collaborations.

This document was drafted by Jaromil in eight years of extensive travels in very different contexts around and between Europe and Asia, nourished by several exchanges along the way and finally made public on the 8 aAugust 2008. While it is impossible to enumerate all of us and our collective soul, we still like to say thanks to the following individuals for witnessing the birth of this document. After eight years it would take too long to thank everyone involved, so let the people now remind the many others not mentioned: Richard M. Stallman, Gustaff Harriman Iskandar, Venzha Christawan, Irene Agrivina, Timbil Budiarto, Viola van Alphen and Kees de Groot, Elisa Manara, Julian Abraham, Nancy Mauro-Flude, Gabriele Zaverio: they witnessed[30] the birth of this document under the Vulcano Merapi, our minds in vibrant exchange during the Cellsbutton[31] festival and Helarfest[32] in Bandung and Yogyakarta.

Thanks, a thousand flowers will blossom!

[29] http://ur1.ca/f6p5

[30] except for RMS with whom I had email exchange during those days, and others who were in connection that day climbing other vulcanoes

[31] Organised by the House of Natural Fiber, http://ur1.ca/f6p7

[32] Organised by Common Room, http://ur1.ca/f6p9

Smári McCarthy

11 The End of (Artificial) Scarcity

The modern materials economy has been marked by an unwillingness to face the subtle repercussions of the industrial revolution. In this essay I intend to play out this future drama of mankind in three parts. First, I will set the stage by showing that we have perhaps unknowingly built several political assumptions into our society in such a way that we cannot see these foundations, let alone replace them when they are sinking into the mire. Second, I will show that the failure of these foundations is not merely inevitable, but that it has already happened. Finally I intend to try to describe a couple of methods we can use to build new egalitarian foundations for our societies.

11.1 Act 1. Our Unspoken Mythology

A myth is a powerful thing. The power of a story, an epic or a tale is formative to a culture, from the epic of Gilgamesh to the stories collected by the Brothers Grimm and onwards to *Star Wars* or *Harry Potter*. The stories of our time give us the context by which we live our lives – the stock phrases, the iconography, even, nowadays, styles and variations. Every era has its heroes, and the narratives they follow from are strongly woven into the mood of the era, as both reality and fiction

move forward in a powerful symbiosis – who would Beowulf have been without the conception of evil hidden in the darkness personified by Grendel? Would James Bond have been interesting if not for the Cold War and subsequent hiccups and hijinx in global politics?

Before the advent of writing, stories were transmitted from person to person by word of mouth. Until the printing press came to be they continued to go by word of mouth primarily but were also preserved for posterity in a slightly more permanent and immutable form. The printing press changed all that, it provided a platform by which two things could be achieved. First, the formalization of myths – no longer would they be subject to faulty memory or creative manipulation, embellishment or subjugation. Second, the elimination of scarcity – the printed myths in their more immutable form could be reproduced almost indefinitely, allowing the ideas presented to reach an almost infinitely larger audience, given time.

Our stories have captured well the struggle for freedom. The premise of Arabian nights is the thousand and one nights in which the sultan is told a fascinating tale by his harem-bound storyteller who yearns for freedom from captivity. Dickens's stories often featured themes of freedom, from *The Tale of Two Cities* to the *Christmas Carol*, the protagonists seek freedom of some kind. *Oliver Twist* told of a boy wishing for freedom from poverty that was unjustly assigned to him as an unwanted birthright. Even Shakespeare put his finger on the topic every now and then; Romeo and Juliet's desire to be free from the constraints of their social situation, feeling that the battles on the streets of Verona weren't necessarily what they signed up for. Some are more blatant than others in this, Orwell's *1984* and *Animal Farm* notwithstanding.

All of the above can be studied in a number of ways, and is. While folklorists may refer to the Aarne-Thompson system[1] as a way of understanding the stories' structure, and semioticians may consider the symbolism within a tale or the meaningful patterns that emerge in collections of stories[2], there may be a better field to use in our exploration of the theme which interests us the most in this instance, namely freedom.

[1] A system which enumerates roughly 2,500 basic plots that manage to encompass most stories. See Antti Aarne, *The Types of the Folktale: A Classification and Bibliography*, The Finnish Academy of Science and Letters, Helsinki, 1961, for Aarne's original system which was later expanded by Thompson.

[2] A fairly benign guide to Semiotics for people unfamiliar with the term is Daniel Chandler's Semiotics for Beginners, http://ur1.ca/f6ro

11.1.1 Formative myths

The field of memetics came out of Richard Dawkins' book *The Selfish Gene*[3], which applied the phraseology of epidemiology and genetics to the concepts of ideas. Memetics studies evolutionary[4] models in the transmission of ideas, and is as such as much born out of information theory on the one hand and cybernetics on the other as much as it is from genetics. In fact I generally consider memetics to be a sub-field of cybernetics, which I'll come to later.

The meme (or possibly meme-complex) of freedom is very popular and very powerful, being transmitted from an ardent believer (memoid) to a potential host through various means. Indoctrination generally begins young as with any potent idea, like language or property or respect for elders. Freedom also seems to be a meme that people are prone to reinvent if they aren't infected with it and they find it might be useful. Freedom, as a meme, has several flaws though. It is largely undefended against misrepresentation, it has inconsistent sociotypes (or social expressions of the meme), and it appears quite prone to memetic drift, or the idea becoming watered down as time progresses, until such a time that it snaps back into full force, creating a sawtooth-wave of sorts.

All myths are not fiction. Some myths are portrayed not as stories for campfire sittings or late night movies, but rather as if they were the truth. These are generally called lies, but only after they have been discovered to be untruthful. Until such a discovery is made, these *fictitious* myths are quite as formative as their fictional counterparts to our society. A statement regarding some well respected businessman's deviant sexual behaviour can damage his reputation, even if it is a lie. And even after such a lie has been discovered, much irrevocable damage may have been done.

An example of such a formative lie would be McCarthyism in the 1950s. It was a widely held belief of the time that communists were a purposefully destructive force, acting in unity within US borders in an attempt to destroy democracy and freedom and all that. This belief was strengthened by the will of uncle Joe[5] and others who used the myth to push forth their political agenda. Perhaps they

[3] Richard Dawkins, *The Selfish Gene*, 1976

[4] It's worth mentioning that not all evolution needs to be Darwinian evolution; I think ideas are more of a Lamarckian type, if any model of "evolution" (as opposed to emergence) applies at all here.

[5] I am in no way related to former senator Joseph McCarthy, but I sure like to make that joke. Apparently, so does the Icelandic media, as can be seen in a late June 2008 edition of Fréttablaðið, where I am likened to the senator.

believed in the myth, perhaps they didn't. It doesn't matter. The meme of anti-communist sentiment flourished under these circumstances, the cognitive image was strengthened, and society changed because of it.

Granted that we know that myths and lies can be formative to our society, and our keen interest in this meme called freedom, the central theme of our movement[6], it is self-evident that we would benefit our choice meme greatly if we were to discover lies which have a negative effect on it. There are two in particular that are worth mentioning in this context for their profound effect on our civilization over the past two hundred years and the astoundingly small amount of scrutiny they have received.

11.1.2 Centralization culture

Modern political science narrowly and crudely separates all modes of thought into the socialist and individualist movements with few exceptions. Whilst most political scientists will agree that there is more to the world than exists in the capitalist and communist philosophies, they tend in general to sit on either side of that particular fence and toss faeces thence without regarding other pastures. But deep within both political theories lie two assumptions that are held up high. The Marxists may disagree with the Smithists on the issues of who should own what and who should rule over whom, but despite all their diatribes they are dear buddies when it comes to the questions of whether anybody should rule anybody and whether anybody need own anything.

In 1651 Thomas Hobbes published his *magnum opus Leviathan*, a thickset tome using complex language to explain a set of ideas regarding the nature of control in man and animal, the essence of authority and the purpose and correct modes of civilization. In it, he makes certain statements as to the nature of government in particular, easily stating that in lieu of a strong centralized government, human civilization will dissolve into chaos[7].

[6] This would be the *Free Society Movement*, and it's sub-classifications far and wide, reaching the shores of the Free Software Foundation, the Electronic Frontier Foundation, Creative Commons, and so on.

[7] "The only way to erect such a common power, as may be able to defend them from the invasion of foreigners, and the injuries of one another, and thereby to secure them in such sort as that by their own industry and by the fruits of the earth they may nourish themselves and live contentedly, is to confer all their power and strength upon one man, or upon one assembly of men, that may reduce all their wills, by plurality of voices, unto one will [...]", Thomas Hobbes, Leviathan, chapter XVII (Of the Causes, Generation, and Definition of a Commonwealth)

The reason given for this is that man is, in his own right, a haphazard beast and completely incapable of making rational decisions, and thus it is only natural that his welfare be put into the hands of infinitely more capable people such as, say, kings.

Does that sound a little bit odd? Consider this assumption in the context of capitalism. Very few capitalists entirely reject the notion of government[8], most saying rather that the government should stay out of the way of the natural behaviour of the market, which is busy doing its thing. A government has very few tools with which to sway the behaviour of a community, the first and foremost being the legal system, which provides a system of restrictions (or *boundary conditions*), which act as parameters within which everybody is bound to act. Restrictions, the capitalists note, put limits on the growth of an economy. Rejecting government altogether would be to reject restrictions altogether, but most capitalists feel strongly about keeping government handy in case they screw up.

I mentioned that *Leviathan* addressed "nature of control in man and animal." This wording is not accidental. In the early 1950s they were used by mathematician Norbert Weiner in his description of a new field of study with which he had become infatuated, which he verily named *cybernetics*, or "control theory"[9]. The purpose of cybernetics was to explore how authority propagates through systems, and it has alarmingly deep things to say about such things as computers and tribes and economies and so on. Nowadays cybernetics is rather unpopular, with one of the world's largest cybernetics faculties having recently been merged with a faculty of computer science, as if it were so narrowly defined.

In previous decades cybernetics had glorious times, like when Stafford Beer spent time in Chile helping Salvador Allende's government install a computer-controlled network of sensors and transducers, connected upstream through statistical software, that gave a simple method of reacting to situations at the factory, district, county, or national level[10]. The idea was to use a network of teletype terminals running through the phone system, a precursor to the Internet, to maintain complete information about the status of the nation's economy; the Marxist

[8] I could point at Milton Friedman and Friedrich von Hayek, but I'm not going to for reasons that will become apparent.

[9] In Lawrence Lessig's *Code v2.0*, cybernetics is misrepresented as a study of "control at a distance through devices," missing by far the subtlety of actually studying the nature of control itself and the way it behaves in systems.

[10] See *Fanfare for Effective Freedom*, by Stafford Beer.

government having the ability to do without the capitalist theme of withholding information that may benefit competitors.

The project was killed along with Allende himself when the CIA sponsored *coup d'etat* organized and enacted by General Augusto Pinochet shocked the Chileans into submission[11]. It is unsure to what degree the CyberSyn project, as it was called, affected the CIA's decision to sponsor the coup, but it is clear that one of the key motivations for replacing Allende's Marxist government was to temper the rising prices of copper, Chile's main export, which was required for the growing information infrastructure throughout the west: CyberSyn, by heightening the flow of information through the industrial sectors in Chile and affording the workers a more egalitarian method of industrial organization, was threatening to make the adoption of information technology too expensive in the western world at a pivotal point in time. Perhaps one could argue that Pinochet saved the Internet by enslaving an entire nation, but in doing so set information technology back by decades.

11.1.3 Building the System

In cybernetics, you consider a *system* to be a *state space* upon which a set of *transformations* may act[12], and by mapping all possible transformations on the state space you can find contextually congruent states and possible paths that the system can take. To visualize this, take a piece of paper and draw a circle on it. The paper is the system, the circle represents the desired operational boundary of the system. Now place a point randomly inside the circle. This is the system's state. Now without lifting the pencil, go back and forth within the circle, making scribbles.

A number of interesting questions arise. What happens if you keep going back and forth between the same places? This is called homoeostasis, and is generally considered a good thing, albeit somewhat unexciting. It occurs when you have a harmonic oscillation between states. Call it harmony if you will. Don't call it Utopia, please.

Does distance traversed within the circle matter? It does. If you go too far your system is very unstable, and is likely to explode. If you don't go far enough the system may grow "cold" and die out, being replaced by something else entirely[13]. What is an explosion? That's when you leave the circle. That's when you enter

[11] See *The Shock Doctrine*, by Naomi Klein.

[12] See *An Introduction to Cybernetics*, by W. Ross Ashby.

[13] A Douglas Adams quote comes to mind: "There is a theory which states that if anybody ever figures out what the Universe is and what it's for, it will immediately by destroyed and replaced with something different. There is another theory which states that this has already happened."

uncharted waters. It shouldn't really happen, but let's remember that this is a large and complex chaotic system where we are faced with any number of situations such as global warming, *coups d'etat* and financial meltdown. Not everything that can happen exists within the circle; rather, we define our circle in terms of what kind of behaviour we deem acceptable.

Government then, is the device that draws the circle, that sets the rate of change in the states, or at least installs speed bumps and so forth to keep things in check and balance. If they draw the circle too tight – limiting freedoms too severely – they risk explosion. If they put in too many speed bumps, they risk cooling out and being replaced by something stronger.

And that's why the capitalists like to keep the government around, because they control the lasso, they can make sudden changes to the playing field. This can prove useful, they believe.

Consider now the implications of the *Leviathan statement* on communism. Marx & Engels noted the importance of the control of the means of production to be in the hands of the producers themselves, which sounds quite reasonable. The idea being that nobody has a say in how and when things are produced unless they are actually going to be doing the work. They wrote of ownership by the proletariat, rather than ownership by the bourgeois[14]. So that was theoretical communism, drunken deeply from tankards forged in the anarchist tradition. But in applied communism we have seen all over the world a tendency towards drawing ever tighter concentric circles, building a centralist government which tells people what the plan is and how it shall be accomplished by way of bureaucratic output in industrial dimensions.

Verily has a Leviathan been pulled from a hat, and the assumption of strong centralized government has been abjured into reality. The result is that most modern local or municipal level government activity is applied to jumping through hoops manufactured by authorities higher up in the chain. My local town government has employees writing reports for the ministries of industry and education and environment, and they in turn have employees writing even larger reports for the European Union and the United Nations and so on. The power base has even become so diluted that it is no longer clear exactly on whose authority many things are being performed.

[14] A term which has no relevance any more, since industrialization and destruction of natural habitats have forced the majority of humanity to now live in cities. Now it would be more correct to speak of *owners of capital*, or, erm, *capitalists*.

11.1.4 Scarcity set in Stone

More than a century after Hobbes, an awkward man named William Godwin wrote a book named *An Inquiry Concerning Political Justice*. In this book he argued against the *Leviathan statement*, insisting that it was a myth, a lie, something that might not actually be right and that somebody should check. The book sold well at first, attracting the attention of many famous people such as the feminist Mary Wollstonecraft (who later became Godwin's wife), the romance poet Percy Shelley (who later ran away with Godwin's daughter Mary) and former US vice president Aaron Burr (who later killed Alexander Hamilton because of a silly dispute[15]). But amongst Godwin's erstwhile readers was at least one who didn't take the meme of political justice without a grain of salt. Thomas Malthus, being well versed in the *Leviathan statement*, wrote in response to Godwin a vast tract, *An Essay on the Principle of Population*.

In his essay, Malthus pointed out that without a strong centralized government (without using those words) imposing arbitrary restrictions on resource allocation to the proletariat (without using that word), human population would continue to increase exponentially until such a time that all the resources available to man would be depleted and we would all die of starvation and chaos would ensue[16]. This was a commonly held belief at the time, but Malthus gained notoriety for putting it in words and justifying it with graphs. Suffice to say Thomas and William[17] argued about this for several decades, and Thomas won hands down. As in any philosophical debate, the validity of the arguments hinged not on their truthfulness, but on their memetic infectiousness, which in Thomas' case was severely augmented by support from the governmental powers in Britain, desperate to hold on. The Malthusian myth was forged and is still being reinforced to this day, yet depressingly few Malthusians go out of their way to read the works of Godwin and Condorcet which are heavily referenced in his *Essay*.

[15] In *The Federalist Papers* as published by Bantam Classics, Burr is spoken of as "volatile" in defence of Hamilton, who wrote of freedom and traded in slaves. The entire Burr-Hamilton incident is a fascinating one but outside the scope of this essay.

[16] "Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second. By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.
This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere and must necessarily be severely felt by a large portion of mankind.", Thomas Malthus, *An Essay on the Principle of Population*, Chapter 1.

[17] And others, including Nicholas de Caritat, marquis de Condorcet, who developed the *Condorcet* voting scheme.

Consider our circle. In the cybernetic, this means that there exist innumerable paths from our current state that lead to states wherein we all die from starvation. I'll assume this lies outside of the circle since we deem that an unacceptable result. Malthus' claim was that it was government's job to prevent society from applying certain transformations that would lead to an exhaustion of resources.

Remember that this is all happening just as the industrial revolution was taking its first steps, tumbling awkwardly over itself, making silly mistakes and not really getting very far. Machines, back then, were a joke, despite Watt and Carnot and the others. So little could Malthus know (although Godwin predicted) that industry would alter the entire materials economy to a point where resources were the least of our problems[18], so it's fair to forgive him. What cannot be forgiven is how this assumption of *scarcity*, the meme of *poverty*, has managed to survive the industrialization of the western world without being attacked or scrutinized too deeply.

Look at the figures. Agriculture in the western world now produces more food than would be needed for a humanity twice the size[19]. About half of this food is thrown away[20], and yet about 800 million people are starving[21] and in the west millions of people are obese. Does this make sense? Does poverty make sense?

Industry was supposed to remedy this. Wasn't it? Was industry not intended to replace the human hand with machines, transforming hard labour into a caretaker's affair of relative ease, letting machines fulfil our every want and desire in plenty, letting us all lead comfortable lives of affluence? Or was the industrial revolution a purely technical issue, hackers of yore making things that did suave stuff just because they had a strong desire to solve technical problems? Doubtful. As technocentric as hacker[22] culture tends to be, hackers have politics up to here. Look

[18] For a couple of hundred years, at least.

[19] Statistics available at http://ur1.ca/f6rp; for example, 784.786.580 tonnes of maize were produced worldwide in 2007, 651.742.616 tonnes of rice, 216.144.262 tonnes of soybeans, 1.557.664.978 tonnes of sugar cane, and so on. That year 6.186.041.997 tonnes of *vegetables* were produced worldwide, which is roughly a tonne of food per person per year. The US Department of Agriculture states at http://ur1.ca/f6rr that the average person consumed 884.52 kg of food per year, and that statistic includes meat and dairy products.

[20] See Timothy Jones; http://ur1.ca/f6rt

[21] According to FAO, 852 million people, about 13% of the world's population. "Of this, about 815 million people live in developing countries, 28 million in "transition" countries of the former Eastern Europe and ex-Soviet republics, and about nine million in the industrialised world." http://ur1.ca/f6ru

[22] I use the term *hacker* in the sense "A person who delights in having an intimate understanding of the internal workings of a system, computers and computer networks in particular," as defined in RFC1392 and echoed in senses 1-7 in the Jargon file. http://ur1.ca/f6rv

at the free software movement, look at Wikipedia. When technically minded individuals come together to address problems, be they technical or political or social, they do so with a fervour that makes people's heads spin.

Nobody is going to convince me that Alessandro Volta didn't think electricity wasn't going to tip the game slightly in favour of the peasants. Nobody is going to tell me that Robert Fulton wasn't acting in what he believed were the interests of mankind. "Oh, look," I can't imagine him saying. "there's an opportunity for further oppression of the working classes by making them not only have to work, but have to fight for the right to work too by making them have to compete on an open market against machines capable of working tirelessly with arbitrary accuracy!" Nobody is that stupid. Or are they?

Let's fast forward a bit. In 1968, whilst student uprisings were happening in Paris, Milan and San Francisco, to name a few of the more important battlegrounds, a professor of biology at University of California at Santa Barbara, Garrett Hardin, crawls out of the woodwork of relative obscurity and writes of the *Tragedy of the Commons*[23], a thought based very deeply on the *Malthusian statement*. Here he claims that common ownership (or rather – stewardship) will end in tears when the resources run out. But Hardin is a post-industrial person saying that the existence of a commons was contradictory to the assumption of scarcity. That with anything in common or communal ownership, be it works in the public domain or resources not specifically allocated, there was a threat that the commons would wipe themselves out. Given scarcity, people would take and take and never give.

Hardin, in making this statement, was doing game theory a big favour. Game theory was a relatively fresh branch of mathematics made famous by Nobel laureate John Nash, that inspected strategies and situations in terms of *games* played by *players*. Examples of strategies developed under game theory were minimax (commercialism: maximize the effect of your actions and minimize the effect of those of your opponent) and tit-for-tat (the cold war: if you launch nukes, so will we). Hardin produced a strategy that was widely adopted, and it is known as the CC-PP game. CC-PP stands for "Communize Costs-Privatize Profits." In this strategy you leech off the investments of your competitors, making the community as a whole pay for as much of your own expansion as is possible, but at the same time making

[23]Originally printed in Science magazine with the introductory line: "The population problem has no technical solution; it requires a fundamental extension in morality". See http://ur1.ca/f6rw.

sure to keep all profits for yourself by not divvying out your booty to the rest of the pirates.

Exploring this within our system-circle (which has now admittedly become something of a mess), what we're doing is pushing the system in directions that will make others pay for our profits. Who better to do this but the government, which already has the legislative authority to do so?

11.1.5 The Best Insurance Policy Ever

Say what you will about Friedman and co, but at least they were honest[24]. The rest of the capitalists are playing the CC-PP game. Consider a few examples: after the great depression John Maynard Keynes suggested ideas that became rolled into Franklin D. Roosevelt's New Deal, which was accepted and performed quite altruistically. But if we look at the situation, what was being done was huge debts were being forgiven towards the people who caused the depression to begin with and society as a whole was being made to pay. In Iceland in 2008, as soon as the financial situation of the banks was regarded as ominous, the banks were – and get this – *nationalized*[25]. The assets of the banks were seized and the government put in direct control of the daily operations of the bank.

The owners were magically freed from their already non-existent obligations towards the financial stability of the bank, losing a pile of money that didn't exist either anyway, and the full brunt of the debt that the owners had created within the bank pushed onto the nation.

The exact same story happened with Fannie Mae and Freddie Mac, and any number of other examples come to mind. Would a bank ever be nationalized if it were doing well? Not at all. Indeed, as was seen in Bolivia in 2001[26] the obverse is true. Profitable ventures, such as selling water to peasants, tend towards privatization in any system that assumes scarcity of the same. Instant profit!

The net result of the CC-PP game, in this instance, is the production of a situation where the rich play by the Marxian rules and the poor play by the Smithian rules: Socialism for the Rich, Capitalism for the Poor. If you just happen to be one of the unlucky sods who doesn't own stocks and wear a $5,000 suit to work, you're in a dog-eat-dog world and getting beyond that point will always be problematic at best. Indeed, our cybernetic circle diverges into two circles at an ever-accelerating

[24] Well, no. But it's a good argument to make nevertheless.

[25] For more details on this, see http://ur1.ca/f6rx and it's many references.

[26] See *¡Cochabamba!: Water War in Bolivia*, by Oscar Olivera and Tom Lewis.

rate, where one of the circles is a game plan for the wealthy and the other is a game plan for the poor.

The government, then, is a tool being used by two factions to preserve their own dominance. For those who strive to increase their influence, a government is a way to satisfy their egotistical yearnings. For the capitalists, a government is the best insurance policy other people's money can buy.

11.1.6 Manufactured Scarcity

And all of this comes back to the underlying principles of the political doctrines of Smith and Marx: Hobbes' Lie and Malthus' Lie. There are other lies, but these are the core, as far as I can tell. No other elementary assumptions built into the system are as well defined and as thoroughly cherished by all parties.

In fact, government has been very busy enforcing these lies, upholding the myth. Scarcity is the tool they use in conjunction with the owners as a method for ensuring the subservience and subjugation of those not indoctrinated in their world[27]. Scarcity in food and commodities by an inherently faulty distribution network, implicitly limited by people's lack of regard for one another and explicitly limited by trade barriers, tolls, taxes and tariffs. Scarcity in culture by the confinement of *fine art* and cultural events within the lucrative boundaries of the cityscapes, as well as the projection of knowledge into books – immutable and easily scarcified by the producers, who sell at whichever price fits their fancy.

Everywhere in the system, scarcity is being manufactured to insure the profiteers against the dangers of abundance. Working from Malthus' Lie, the myth of scarcity is being upheld quite vigorously as a fundamental truth about the nature of the universe, while elsewhere in the system people are hard at work disposing of excess production and obstinate themes, colour schemes and styles in favour of new.

An example of this is the production of academic textbooks. When a professor of some field appears at the publishers with a manuscript for a new textbook on whichever subject, the publisher will explore the availability of other similar textbooks, the originality, the readability and the depth of the manuscript, and the statistics on how many people are likely to study such a subject. After which they will decide on the price of each copy of the book in such a way that they are destined to make a profit. Quite reasonable, assuming scarcity, but the idea of publishing the manuscript in a readily copyable way has not caught on.

[27] I almost wrote *of the working classes* here, but I fear instigating a class war is a perfect way to maintain the *status quo*. See any class war in history for examples of this.

Why? Copyright.

Back in the time of Hobbes, copyright law did not exist[28]. Mapmakers toiling day and night to copy out maps by hand for ships to sail by and people to travel by were extremely jealous of their property, and went to great extents to maintain their unequivocal right to produce maps based on their particular data set, and as a copy-protection measure they would mark in false roads, so called trap streets, or mangle names of places, so that if another were to copy their maps they would be easily found out. Back in those days illegal copying wasn't a large problem, but despite this the producers of the maps were damaging their products by decreasing their accuracy in order to foil people who wish to mimic that (in)accuracy.

This kind of early DRM[29], along with monopolies in the publishing business[30] and later a succession of laws starting with the Statute of Anne and the Berne Convention and moving through to legislations such as the Sonny Bono act in the United States, copyright has been transformed into a means of production, not of works of art, but of scarcity. Scarcity of the very works of art it claims to protect. Before the advent of the printing press and the phonograph, this was almost cute, since it was rarely worth the hassle of copying data by illegal means anyway because of the shortcomings in the technology. But with the further digitization of society, copying became easier and easier, and the scarcity was upheld increasingly vigorously by the lawmakers.

Imagine you live in a far away land where the penalty for stealing bread is quite severe. You are starving, and so you attempt to steal a loaf, but are caught bread-handed. This poor judgement on your part provides you with a ten year prison sentence. Fair enough, 'tis the law of the land.

But let's imagine that the day after you are incarcerated, a new technology is invented. This new technology produces bread out of thin air at no cost to anybody, in virtually infinite quantities, and nobody need starve ever again. How just, then, is your incarceration? You stole the bread while bread was still scarce, and there was no way of knowing that this technology was just around the corner, so perhaps it is still fair; but obversely, if a law were passed making it no longer criminal to steal the bread, would you not wish to be released?

[28]The first example of copyright law in the modern sense being the Statute of Anne from 1710.

[29]Digital Restrictions Management, or Digital Rights Management, depending on who you ask. Generally speaking a technological method intended to enforce copyright. These invariably fail for numerous reasons. See *Microsoft Research DRM* talk by Cory Doctorow, http://ur1.ca/f6s0

[30]Held originally in Britain by the Worshipful Company of Stationers and Newspaper Makers.

No such law is passed, and a few years pass as you mull over these details in your stinky cell, when suddenly a new prisoner appears. It is your brother, and he has just been convicted of stealing bread. Outraged, you ask how can that be, since bread now exists in such plethora that nobody needs to steal bread?

Ah, your brother replies, it may well be that the technology exists to produce bread at no cost to anybody, but it is still criminal to steal bread, and not everybody owns a breadulator to make bread with. In fact, the bakeries that produced the bread before have bought up all the breadulators and have claimed a patent for their design, so they can now prevent anybody from building their own breadulator. Now bread costs the same as it did before, and it is of course illegal to steal something that is scarce, be it from your neighbour or from the bakery.

This inane example illustrates in very silly terms how copyright works in the digital age, and highlights one important aspect of it: that not only is our sociopolitical system thoroughly dependent on the concept of scarcity, but the producers who control the means of production will use their means to produce scarcity as well as products, in order to maintain their worth in the system.

With each producer doing this, including the producers of money itself, the system hangs in a balance where producers attempt to scarcify their produce to maintain their worth relative to the prices of everything they themselves require from other producers to survive. If anybody over-scarcifies or under-scarcifies, there is chance of a crisis emerging. If it's food that is over-scarcified, people starve. If it's oil that's under-scarcified, middle-eastern nations get invaded. If it's money that's over scarcified, people stop trusting each other to maintain the scarcity-equilibrium and the entire economy explodes.

11.1.7 A Recipe for World War

We're in our circle again, this time we draw a line against our will to the point where we get a deep financial recession, just like in the 1930s, just like in 2008. Then something weird occurs. In the cybernetic, this is called a backlash. This is when a large and sudden change in the system causes another sudden change in the system. A domino effect. Probability theorists call these Markov explosions[31]. An infinite amount of events occur in the same instant, an apocalyptic causality that

[31] Markov explosions occur in stochastic processes when an infinity of events occur simultaneously and the system resets itself to a random state. There is a lot of deep literature on the subject that warrants scrutiny, but as an introduction for the mathematically minded, I suggest *Markov Chains* by J.R. Norris

devours every aspect of the system, and then, suddenly, it's over. The world has changed.

In a post-depression world, a lot of people have a hard time getting their bearings. Confused, people lash out against whatever they can find to fault, be it the government, the owners of the means of production, or even people from outside of their tribe, city, nation or other demographic group. Increased nationalism is quite a typical result of financial crisis, look at World War I, World War II. Look at the Napoleonic wars. Each was preceded by a spike in nationalism, which in turn was preceded by a financial collapse of some type[32].

The Napoleonic wars followed immediately from the French revolution, which in turn followed bankruptcy in the French state. Simultaneously in the American colonies financial instability was also a hot topic, which led to demand for taxation with representation or no taxation at all. These events and others like it culminated in extreme nationalism – the Americans wanted to be Americans, the French wanted to rule everybody, the British wanted to rule everybody, the Danish and Norwegians had problems fighting off the British while the Swedish and Russians and Prussians tried to fight off the French. Financial instability led to nationalism led to world war. Is this not avoidable?

11.2 Act 2. Burning the bridges when we get to them

From the preceding pages we can learn a few things. The most important lesson is that the paradigms that form the basis of our mental models of reality can be built upon assumptions that are neither intended, apparent, nor correct. A second is that all current forms of society and government are built around the assumption of scarcity, and that scarcity can be shown not to exist any more[33]. The third is that because of these assumptions, all higher dynamics within our system are fraught with terrible inequalities and eventualities, namely poverty, famine, oppression, bankruptcy, prejudice and war.

[32]The historical justification for this claim is complicated. The Great Depression is easy, but see also the implications of the 1873 panic following the crash of the Vienna Stock Exchange on Eastern Europe, and the effects of the collapse of London banking house *Neal, James, Fordyce and Down* in 1772 on Western-European trade, which led directly to the Boston Tea Party. Consider Kondratiev waves in this regard.

[33]Or at least be insignificant. Further details of remaining scarcity follows.

11.2.1 Homogeneity and Censorship

At the outset I made fleeting mention that increasingly potent copying technologies had made creativity harder to accomplish, since accurate copying leaves little room for embellishment. Constant and well-defined data, such as the text of the Constitution of the Swiss Confederation or the original manuscript of a Harry Potter book is fairly resilient to *ad-hoc* editing, whether for creative or malicious reasons. In Orwell's *1984* the protagonist's occupation was to be a historical revisionist, altering all distributed accounts of the past to meet the goals of the present.

Such alterations of available information cause people to be less able to gingerly estimate their situation, especially if given evidence contradictory to what they know. Revisionism contaminates the state-space we live in and effects our path through it like walls raised around us blocking other exits. Governmental speed-bumps have been transformed into causeways, designed to keep us forever within their boundaries at a speed that they can very easily control.

In less abstract terms, this is the purpose of the Great Firewall of China[34] and other censorship tools, including the less well known Swedish law that allows censorship of websites considered to contain child pornography. The danger of such systems is that there is no way to know what has been placed on such blacklists without bypassing the censorship. Perhaps somebody has maliciously censored information that could affect the direction taken by the society with regard to certain issues.

Censorship need not be absolute to be effective. Western governments have in recent decades realized that by applying knowledge of trends and emotional reactions, they can avoid the need for censorship by simply placing information out of sight. Press conferences confronting uncomfortable issues can be pushed to times of the day where they're unlikely to be televised, or if televised not watched by many. Unpopular results, such as dioxin output from industry, can be drowned in bureaucratic noise, such as measurements of other less damaging chemicals, so that very few would be willing or able to plough through the data looking for the bad results. In legislation unpopular motions can be stacked up with more popular issues in sets, to hide them from scrutiny.

The point of this tangential discussion is that not only the mythology upon which the system is built affects the way we behave, but also the quality of the information available to us.

[34] A computer firewall that filters all Internet traffic passing within Chinese borders, allowing arbitrary and even asymmetrical censorship by the government.

Memetics and indeed cybernetics is a dangerous field because of the danger of misunderstanding. Faulty data can be worse than no data at all, as our credence for getting some output is generally high; it's only when we get nothing – like those living behind the Great Firewall of China[35] – that we start to raise our eyebrows.

In our journey through the state-space of our reality, being pushed this way and that by cybernetic influences that we may or may not be aware of, we are seldom aware of where we are going or what we will find when we get there. A well drawn circle will allow people within to believe themselves to be completely free whilst imposing fairly rigorous boundaries on what paths can be taken.

11.2.2 The Dance Floor

An important feature of authority or control is that everything and everybody has it, and it cannot be entirely eliminated. Authority will always necessarily exist and cannot be done away with entirely[36].

Consider a dance floor. The dancers on this dance floor are when we gaze upon them paired up, one as the *lead*, the other as a *follow*. Sometimes the couples break apart and singularly dance freestyle, and sometimes dancers *steal* partners from one another. The objective shared by each of them is to solve a particular task, dancing, and they do this by submitting control to others or taking control off others, but no single dancer can at any given time have complete knowledge of the status of the entire dance floor. Their knowledge is limited by their perception at any given point, but a dancer who perceives a potential problem arising (such as a collision between two couples) or a solution (such as a fancy move) will take control of the vicinity momentarily to produce results.

In this example – and it is a realistic one – although no individual or group of individuals has been designated as rulers over the others, authority still exists. Each individual has complete authority over herself to begin with, but as the dance progresses individuals may temporarily cede their authority to a *trusted interlocutor* in order to maximize gain.

[35] A stunning feature of the Great Firewall of China is how it feigns non-censorship. The HTTP protocol defines error codes such as 200 (everything is okay), 500 (internal server error), 404 (file not found) and 403 (unauthorized to access). When a censored page is accessed from within the firewall, instead of reporting 403, clearly stating that the page has been censored, the firewall reports 404, as if the censored article did not exist at all.

[36] This may seem a self-contradictory statement from somebody flying the flag of anarchism, but it doesn't trouble me and if you understand where I'm going with all this cybernetics talk, it won't trouble you either.

The key here is that authority flows between individuals in the system, and manipulations of that authority can alter our collective path through the system. Imagine a dance floor where one person stood in the middle yelling out orders, trying to micromanage the crowd. It would not function, as even if we were to grant this single person the unlikely talent of complete oversight, he would not be able to holler orders out fast enough. And if this person were a choreographer who plotted all the movements beforehand, there would be no spontaneity, and the dancing would have to stop intermittently to allow for more choreography. Authority must exist, yes, but like any resource it must be well spent and fairly distributed. *Ad-hoc* authority appears to allow for the highest synergistic benefits, as the natural agreement of all parties to the temporary authority will requisite the mutual benefit of all parties.

This understanding of the nature of authority is a valuable tool to aid our understanding of cybernetics: with this, we have not only established a model for understanding peer-to-peer behaviour, but have also highlighted that any stable system is necessarily and inherently creative. This will be important.

11.2.3 Non-Rival Scarcity

A lot of what has been said can be traced back to a few people. Identifying the villains of this story early on as Hobbes, Malthus and Hardin, the heroes already mentioned are Godwin, Weiner and Beer, and now two more members of our cast shall appear: George Pask and Richard Buckminster-Fuller.

Fuller is well known for his contributions to architecture and engineering, most notably the geodesic dome, but in his less well known book *Nine Chains to the Moon* he wrote of a process he dubbed ephemeralization, by which he meant the way in which advances in technology would allow us to do more with less. Industrialization was exactly that: the advent of machines allowed people to produce more goods with less workforce behind the production; assembly lines allowed for more rapid assembly with less waste of time. Advances in materials science have given us carbon fibre strengthened plastics (CFSPs) that are both stronger and lighter than metals.

The Internet is the hallmark of ephemeralization: it allows us to perform mind-boggling amounts of direct telecommunications and distributed computation using a very elementary method of sending electrical or optical pulses through copper and glass fibre. More with less.

Malthus could not have imagined the industrial revolution, but he could have paid attention to the trend of ephemeralization that Godwin appeared aware of, even if he didn't have quite such a fancy word for it. Ephemeralization alone kills the Malthusian argument entirely. We will be able to sustain an increasingly large population by applying advances of our understanding of the nature of reality to the aim of sustainability. Less will give us more, and chaos is not a given.

This requires some hefty proof. Thankfully it is ample[37].

Things can be categorized into two categories: rival goods and non-rival goods. Non-rival goods are not scarce by definition, giving of them will not diminish one's own supply. This applies to software and mp3s, but not to CDs and concert tickets. The latter are rival goods, but rival goods can be either scarce or abundant, where we define abundance of a rival good not by there being more than we need, but that the function of availability grows faster than the function of need.

11.2.4 Food

One of the most profound examples of this comes from a research paper by Perfecto, *et al*[38], where it is shown that by exchanging manufactured fertilizer with organic fertilizer, for certain crops it would be a simple matter to quadruple the annual yield, with multiplicative results across the board. Add this to the earlier statement that we already produce enough food even discounting meat, fish and dairy products to sustain humanity at its current level and still have leftovers, and it is clear that we are not destined to starve to death any time soon. Food, our most basic need, is a rival good, but can be considered abundant because it is currently available in much greater quantities than is required, and because it appears that technological advances will maintain this superiority in the food supply.

The beauty of the food discussion is that it is so long since invalid. Peter Kropotkin wrote in 1892 *The Conquest of Bread*, wherein he points out fallacies in feudal and capitalist economical systems in part by showing the global abundance of food indisputably.

[37] See *The Wealth of Networks* by Yochai Benkler and *The Democratization of Innovation* by Eric von Hippel for much more proof than I shall provide here.

[38] *Organic agriculture and the global food supply* , Ivette Perfecto, *et al.*

11.2.5 Shelter

Another of our basic needs is shelter. Globally we are faced with a housing crisis, with an estimated 100 million homeless in highly developed areas[39] and a further 600 million in developing countries. Note here two things. First, there is approximately one starving person for each homeless person worldwide, but in developed countries homelessness is disparate to hunger. Second, the Geneva Convention grants prisoners of war rights to shelter, food and a blanket, whilst not a single government in the world has granted homeless people the same rights although they are granted by the Universal Declaration of Human Rights[40]. With the size of homes having grown substantially in the western world over the last fifty years, there is absolutely no reason why there should be prevailing homelessness.

The argument made for homelessness is generally a lack or high cost of materials for building construction. One cause of this is the high standards maintained by legislation in the form of building codes in some countries, where many forms of affordable housing have been simply made illegal, such as the Hexayurt infrastructure package[41] and many other comparable projects[42]. Another cause is luxuriation. In the city of Malmö, Sweden, authorities faced with a large number of lower and middle class people without adequate housing started a huge project building expensive luxury homes along the southern waterfront. The logic was that with luxury homes available, upper class citizens would move to these, freeing up cheaper homes elsewhere in the city for the lower and middle class citizens. This is generally referred to as "trickle-down" economics, where raising the standards for the uppermost echelons is expected to raise the overall average to acceptable levels.

The real result was that many of these luxury homes still stand vacant and most of those which have been purchased were bought by upper class people from other cities looking to own a second home. The housing problem was in no way averted by these efforts, but rather compounded as it resulted in less viable land for

[39] See *HUMAN RIGHTS: More Than 100 Million Homeless Worldwide*, Gustavo Capdevilla, http://ur1.ca/f6s1

[40] "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.", Universal Declaration of Human Rights, Article 25.1.

[41] See Vinay Gupta's http://ur1.ca/f6s2

[42] See *Architecture for Humanity* by Cameron Sinclair.

development. If the issue had been dealt with directly the result might have been different.

Regarding material costs of housing, these can be severely reduced in a number of ways. Jökull Jónsson *et al* have shown that improvements to the accuracy of the application of the Navier-Stokes equations to structural integrity estimation of concrete can yield significant strength improvements with reduced materials volume and cost. Wallewik *et al* have shown that modifications of concrete viscosity can increase spread speed, allowing for much faster concrete pouring and setting. This could allow for layered 3D printing of buildings in the future, but for the near term allows for much faster modular housing construction. Buckminster-Fuller showed the feasibility of tensigrity structures in housing, which distribute structural load over the entire structure rather than on few key points, which lowers the requirements for overall material strength. Vinay Gupta has developed a $300 infrastructure package for temperate and tropic climates that can house a small family in close quarters with acceptable living conditions. Marcin Jakubowski *et al* have shown that it is entirely possible to build a single storey 100m^2 building from compacted earth blocks for less than $400 in materials costs in the American Midwest. Cameron Sinclair and his Architecture for Humanity project have collected hundreds of examples of ephemeralization in building construction and provided ample proof that current methods of housing construction is both overly expensive and poorly organized.

Long story short, housing is not a problem any more than food. But what of other things?

11.2.6 Electronics

Consumer electronics are an example of a field where decentralization is currently extremely difficult, and yet profoundly simple.

The difficulty here lies in chip fabrication: the arrangement and casting of specialized integrated circuits is a process that, by way of Moore's law, requires increasing amounts of specialization each year. Current microprocessors have circuit pitches of around 3μm in some cases, and this is expected to decrease even more. Each order of magnitude reduction in circuit pitch within ICs increases the complexity further as far as fabrication goes, as they require increasingly pristine manufacturing conditions, including clean rooms, high accuracy machine tools, and so on. However, three things may change that.

The first is that with increasingly fast FPGAs, or Field Programmable Gate Arrays, unspecialised integrated circuits made in bulk can be specialized *in the field*, meaning that whichever specialization is required can be defined by the end user rather than it needing to be defined during the fabrication process. While FPGAs remain by far inferior to specialized chips, they are already eating away at the second factor, which is that hardware-level specialization is increasing overall whilst demand increase for generalized computing devices is slowing. This is due to desktop computing slowly losing out to laptop computers, and the ubiquity of hand-held devices such as mobile phones, music players and other such gizmos. All of these call for integrated circuits of a kind where one size does not fit all, which pressures the chip producers to develop FPGAs even further or to develop smaller scale fabrication techniques.

The third point is that current 3D printing technologies are already lending effort towards arbitrary fabrication of circuits, and as this technology develops it is inevitable that accuracy will increase, eventually to such a level that printing out ICs may become feasible.

At any rate, the assembly of the end products has never been a problem in the consumer electronics industry. The original personal computer was developed in a garage by Steve Wozniak and Steve Jobs, and this trend has held throughout the decades, albeit with some fluctuation, with a recent explosion in the hobby electronics industry giving new strength to user groups such as NYC Resistor, magazines and e-zines such as *Make Magazine* and *Instructibles*, and to open hardware projects such as the Arduino[43]. A lack of strict regulations on electronics production has helped this a lot, although there is significant barrier to entry into commercial production of consumer electronics through safety regulations such as CE.

11.2.7 Transportation

Even the titanic automotive and aeronautic industries are starting to buckle under stress from the decentralization movement, as open source cars, airplanes and even tractors are seeing the light of day. As with housing, here regulations are impeding progress. As Burt Rutan has commented[44], increasing safety regulations in the aeronautics industry have all but extinguished aircraft development, making progress insanely slow even for large companies such as Boeing and Airbus. For

[43] See http://ur1.ca/f6s4
[44] See http://ur1.ca/f6s5

small groups aiming to build manned aircraft, secrecy is just about the only way to avoid the transactional overhead put in placed by aviation authorities.

Automotive regulations are nowhere near as stringent, but in many countries regulations for road safety are impeding reasonable developments. For example, in many Asian countries such as India the auto-rickshaw is a very common mode of transportation, but it is almost inconceivable that such a device would be allowed to drive on British roads.

With corporations such as General Motors having collapsed and the entire ecosystem of transportation being overturned by smaller units like the C,mm,n project and companies like Tesla, what is inevitable is the future realization that these things can be done differently.

11.2.8 Exotic Objects and Real Scarcity

It's worth noting that there will always be scarcity for some things. I call them *exotic objects*. One example is the Eiffel Tower. You can copy the Eiffel Tower exactly atom for atom, but it won't be the Eiffel Tower, it'll just be a copy. Anybody who's been to Las Vegas knows that it isn't quite the same. There's lots of things like that: Mona Lisa, the Statue of Liberty . . . more or less anything that is what it is for cultural or historical reasons rather than physical reasons. My friend Olle Jonsson called this *aura*, which is neat: *aura* can't be copied, although it can be manifested symbolically.

Scarce things versus abundant is a very important point. We tend to treat everything as scarce and that's a very bad thing, but as we stop treating abundant things as scarce things, we should also take note of which things really are scarce and figure out how we're going to treat them. Food isn't scarce, but there's a limited amount of bauxite in the world and thus a limited amount of aluminium. Likewise, things can be abundant globally but scarce locally. Either way, taking stock of the exotic objects and the scarce goods is important if we want to make the most of them and benefit those who need them to the greatest degree.

But while we think of everything as scarce, we're going to waste a lot of effort on trying to overcome scarcity that has been artificially generated, which is stupid.

The lesson to take from this is that we've been doing things in a way that is manifestly stupid and there are innumerable examples in existence of how to do things better. Conservatism will only bring a people so far, and we're past that point already. We've been crossing increasingly rickety bridges as we get to them

for far too long, and it's about time we burned them down and built new ones to better places.

11.3 Act 3. Five steps, a spin, and a new tomorrow

The foundations for the current society are the myths that underlie our entire economy, the lies that structure our mental models, that guide us through the state space. That without a centralized government our civilization will fragment into particles and humanity will devour itself in a war of all against all, and that without regulations on the distribution of goods we will consume faster than we can produce and exterminate ourselves.

These myths have been compounded, mostly in good faith, by consolidation of power and legislative systems that diminish people's ability to self-governance on the one hand and effective utilization of resources on the other, effectively the opposite of what these systems were meant to prevent.

The system we live by has five core institutions that I'd like to address here briefly.

The first of these is the monetary system. We live by a monetary system that has, as Bernard Liataer pointed out[45], four core features: money is created out of nothing and has no material backing, money is created as a result of loans between banks, currencies are defined geographically, and interest is paid on loans. These features mean that the sum of the entire monetary system (all debit plus all credit) is much less than zero, and it grows smaller constantly. There is no way to repay all the debt in the system, and as a result money itself becomes a rival good – we are playing a game where the goal is to pay all debts. In this game, to lose is to go bankrupt. If many bankruptcies occur simultaneously we suffer a Markovian explosion of sorts, called a depression or crisis.

The second of these institutions is our economy. This is different from the monetary system: the monetary system is the means for exchange, while the economy is the exchange itself. Because the means for exchange are rival goods, the economy adapts by assuming rivalry and scarcity in all goods even when there is abundance. Competition replaces cooperation as each strives to pay off his debts, and companies and individuals use missing information – that is to say, secrecy – to their advantage, to increase their chances of winning, to get the competitive edge. Secrecy causes an inability to accurately measure the state of the economy,

[45] See *The Future of Money* by Bernard Liataer.

an inability to relatively estimate demand and supply, so all companies guesstimate their production requirements and invariably squander resources as a result. Companies are then punished for this by the legislative system for certain types of waste while other types of waste are not punished.

The third system is the legislative system itself: Small groups of people make decisions about a set of rules that guide societies through the state space, and all are made to comply. The law represents the needs of the most influential persons in the economy and legislation is guided by their need to not go bankrupt. With every law which is passed, the Hobbesian lie is strengthened, and the capitalists reinforce their insurance policy at the cost of the poor. Instead of the legal system being a small set of simple rules that everybody can agree to, it has become a behemothic beast, our very own Grendel.

The fourth system is the executive authority system. A small group of people is selected to make decisions about the execution of all the ideas they have about how society as a whole ought to be run, and this authority reaches to every niche of society. With regulations and exact control individuals are made to suffer their own individuality, trapped within a vicious cycle produced for that very purpose in concordance with the Malthusian and Hobbesian principles.

Finally, the judicial system has been erected to divvy out punishments to those who act against society, even in some cases for its own good. The executive authorities select judges who make decisions about how arguments should be resolved and these decisions, in many countries, become quite as authoritative for future discourse as the law itself. Judges have become monks who none may question.

This may be done differently.

11.3.1 Identity infrastructure

For our future society we must recognize that at our civilization's core are individuals, not rules or money. People are the most important aspect of our reality and everything should be based upon our needs.

The cornerstone of being attributed to the "people" group is currently the acknowledgement of the government and the owners of banks and corporations of one's existence, which is frequently circularly dependent, which gives one access to the institutions listed above. A national census, a registration office, the publishers of bank accounts, birth certificates, passports and drivers licences, these are the identity-management organizations of our society.

Understanding that identity underlies everything we are and everything we do is paramount, without that understanding we are bound to remain in the current system indefinitely.

So I suggest a new system, one in which the individual is the alpha and the omega, and greed and the production of artificial scarcity is not rewarded.

Step one is to alter the identification system. Rather than being identified as members of society by a centralized institution, embroiled in bureaucracy and haphazardly associated with the truth, we can use friendships as definitions of identity. One's identity can be defined by one's friends more accurately than it can be defined by an institution. This is the philosophy of Ubuntu: "I am who I am because of who we all are". To accomplish this we are going to need a bit of mathematics and a bit of anthropology.

Michael Gurevich, Stanley Milgram, Benoit Mandelbrot and others[46] have suggested that in human society connections between people are so dense that the longest path between people is six steps. Malcolm Gladwell[47] has expanded on the *six degrees of separation* idea by identifying certain individuals as connectors – socialites who are more accomplished than others in creating and maintaining connections between people and who act as social hubs. Although the idea has been largely debunked it still remains true that the maximum number of connections between people appears to be a relatively low number. This matters when we consider the social network.

A graph is defined mathematically as a collection of vertices and edges. If we let the vertices be people and the edges be friendships or acquaintances between people, we call it a social network. The maximum number of connections in a graph is defined by the formula n(n-1)/2 for a graph of n vertices, which basically means that for a graph of two vertices the maximum is one connection, for three vertices the maximum is three, for four vertices the maximum is six, and so on. For 150 vertices you have a maximum of 11,175 connections, for 300,000 vertices there are roughly 45 billion connections at maximum.

The value of a network is defined by Metcalfe's law as the ratio between the number of connections and the maximum number of connections – how close are you to a perfectly connected network. It is obvious that one person could not have 300,000 friends, but if 300,000 people all had 300,000 friends, we would

[46] See *The Small World Problem* by Stanley Milgram. It should be noted that the idea has been largely debunked in its original form, but the level of interconnectivity between people is still very high.

[47] See *The Tipping Point* by Malcolm Gladwell

have so many pairwise connections that it would be mind-boggling. This gives us that in small cities (or countries such as Iceland) it is nonsensical to assume that everybody will know each other. In fact, even in a town of 5,000 people there would be twelve and a half million pairwise connections at maximum, which is realistically unattainable.

The anthropologist Robin Dunbar found[48] a correlation between the average number of members in a tribe of primates and the size of the brain. Extrapolating from his acquired data, human tribes should have a weighted mean size of 148 individuals[49]. Comparing this to real data of primitive tribes has shown this to be fairly accurate in general, with tribes being known to split after having reached a certain "supercritical" size. Applying technological mechanisms such as legal and monetary systems, and even communications technology such as telephones and the Internet has the potential to artificially augment this figure, but hardly beyond a certain degree. The average number of friends on Facebook is significantly higher than Dunbar's number[50], but the availability of telecommunications people more flagrantly befriend people, using assistive technology to maintain more friendships than was previously possible; some have called this *trophying*, but the truth might simply be that we are far more socially motivated than our brains can keep up with without assistance.

The point here is that our world is fairly small because of our "limited" cognitive capacity, and a perfectly isolated tribe of 150 may have 11,175 connections internally but in reality it is more likely that people will be meshed globally, with relatively few connection steps between any given pair.

Let's make use of this, but before we do, let's do some cryptography. The RSA algorithm[51] uses a mathematical trapdoor function – something that is easy to do but very hard to undo – to perform asymmetric encryption. Instead of a pair of individuals sharing a secret they use to exchange other secrets, each publishes a public key and maintains his own secret private key. The asymmetry can be used in many ways. For encrypting, you apply the recipient's public key to a message, and to decrypt the recipient applies his private key to the cipher text. For digital

[48] See *Neocortex size as a constraint on group size in primates* by Robin Dunbar

[49] 150 is frequently quoted as Dunbar's number.

[50] See *Facebook study reveals users 'trophy friends'* by Roger Highfield and Nic Fleming, *Daily Telegraph*. http://ur1.ca/f6s7

[51] See *A Method for obtaining Digital Signatures and Public-Key Cryptosystems* by Ron Rivest, Adi Shamir and Leonard Adleman.

signatures one applies one's private key to a message and to verify it one checks against the public key.

If people in the social network generate key pairs and digitally sign public keys belonging to their friends as a method both of verification of the validity of the public key and to "formalize" the friendship (or acquaintance). This way, your identity is established by your friends as you establish theirs, in a peer-to-peer fashion, without any central authority. This allows us to proceed with changing the world.

From this simple feature we get five results: A monetary system without central banking, an economy without secrets, a legislative system without elitism, an executive authority model without a government, and a judicial system without courts.

I shall explain these results individually.

11.3.2 Monetary system

By utilizing the trusted network in a particular way we can construct mutual credit currencies where business transactions happen like so: Alice wishes to purchase a product from Bob. They decide on a price. Alice digitally signs the invoice, and Bob then does the same. Each takes a copy and encrypts it to themselves. This process can be simply obscured behind the "put credit card in card reader" praxis we are all familiar with, or placed into cellphones or other equipment.

What is happening when this occurs is quite technical, and yet it is quite as simple if not simpler than our current monetary system. Essentially in every transaction money is created by the parties to the agreement and debited to one while being credited to the other, a loan. The sum of each transaction is thus zero, and therefore the sum of the entire system is zero. Because the transactions are small, frequent and symmetrical, it is nonsensical to resort to usury.

The idea that every single person in the system can create money appears weird to people used to our current system. Today banks create money by lending money they don't have to each other, which is an act of trust. In this suggested system, if Bob does not trust Alice personally for the loan of this amount of money, he can either deny her the transaction, or, more sensibly, traverse the trusted network in search of a trusted connection that would allow for that large a transaction. Some sequence of friends connect the two of them together, and based on the amount of trust available between them, they can agree on the debt. Bob trusts Carl who trusts Damien who trusts Eve who trusts Alice, and through this sequence of friendships

the business is conducted. Trust becomes the backbone of the financial system – he who has many friends is a rich man.

This is not much different from our current system, but it is stronger in that the failure of one node (a bank) is far less likely to disrupt the whole system. Furthermore nobody need ever lose this game – the sum is zero, and thus nobody will ever go bankrupt. Some may misuse other people's trust and find it hard to find goodwill and credit, but notice that in this system people are under pressure not to be untrustworthy!

At any given point in time the monetary system can be resolved, meaning that circular debts can be nullified. If Alice owes Bob and Bob owes Carl and Carl owes Alice, the smallest common value can be zeroed out. By traversing the entire network every transaction can be nullified to some extent, and the result will show how far from the average each individual is (and at least one person in the system can be at zero). This can be looked on as a measure of how much a person has contributed to society. Furthermore, for simplicity it is useful to resolve the system frequently, although resolutions may not be useful if too frequent; this hinges on the level of activity in the economy.

Whilst remaining a fiat monetary system, this idea removes interest, centralization and geographical restriction from the monetary system in one go, and it does so simply by utilizing the trust afforded by our personal relationships already.

11.3.3 Economic system

One of the more destructive features of the economy as it is today is a result of the monetary system. Our collective drive to repay our debts causes us to attempt increasingly larger business transactions due to the time-effort overhead of conducting any given transaction – maximizing the mark-up is essential. Large sums are unlikely to be the norm in business in this system as they are in our current system. For distribution purposes end-buyers are both capable and incentivized to link up with producers directly. Middlemen serve less of a purpose except as glorified stockpilers, who can be paid by the producers rather than the consumers to maintain a more localized cache of goods. This would make sense for things such as tantalum, which is mainly mined in the Congo, and may be scarce elsewhere, but would make less sense for things such as capacitors, which, while made of tantalum, could essentially be made anywhere.

Consumption in the economy is stabilized by this kind of "bottom up" rather than "top down" transaction sequence. "The rich . . . consume little more than the

poor,"[52] and what little they do consume beyond the poor is a function of the opportunity cost of consumption. Access to radically decentralized production and high availability of skilled craft industries[53] can offset that opportunity cost by reducing the importance of the distribution subsystem.

Because it is no longer important for middlemen to compete for market dominance and producers to worry about their market share of the demand curve (due to the free availability of *trust dollars*), not only can they strive to create better products that last longer, but they can also freely share information amongst themselves about their production output, methods, and demand; in fact it may even be favourable for them to gloat. This would provide data for a readily available *ad-hoc* worldwide information system regarding the state of the economy as a whole, making futures markets more profitable, commodities markets less wasteful, and business in general move faster and with less impedance. This is Stafford Beer's CyberSyn: predicting and resolving market-level and production-level problems before they occur.

11.3.4 Legislative system

For this to work we need radical changes to the legislative system. By utilizing the trusted network we can build a form of direct democracy that does not suffer from the shortcomings of direct democracy that its opponents will gladly point out.

Granting everybody the ability to submit legislative proposals to the trusted network, legislature itself can be crowd-sourced. Bills can be prioritized by popularity (vote up/down) or reference counts (Pagerank) as a measure of importance, and likewise bills can be altered and "forked" to create derivative bills that can compete. This way anybody can contribute to the options available to voters, for example "yes", "no" and "broccoli", with the last of these being obviously silly and likely to be revised out in subsequent edits.

Voters can choose the options on the bill, and when enough people have voted it becomes *validated*, meaning that the result of the popularity contest between the available options is law. By allowing voters to change their vote at any time, law can change dynamically over time, perhaps with a mandated time lag or significance factor put into the legal framework to cull instability, which serves as a method to clean out laws that do not serve their purpose or are obsolete.

[52] See *The Wealth of Nations*, Adam Smith
[53] See *The Second Industrial Divide*, Michael Piore & Charles Sabel

Similarly, when voters die their vote is discarded, and new voters also get to have their say on any given bill. This causes the society at any given time to be in agreement on the current state of legislature, at least to a significant degree, rather than people being bound by historical legislation that may now be counterproductive.

Elections on a given bill are performed by the vote being digitally signed and encrypted to counting parties, which may be one or many, in the form of "double envelopes". The signature identifies the voter but by way of encryption it is segregated from the vote itself, which protects vote secrecy.

Since votes can be changed at any time, election theft is almost impossible, as voters can be asked to "check their votes" and people can not be violently caused to vote a certain way as they can change them after the vote is complete, and killing people after they have voted will lead to the vote being discarded.

This also means that there is no reason to impose arbitrary restrictions on voter age: any born human can have a vote, and even if the parents use the votes of their children in any which way, the children can change their votes whenever they have asserted their independence or come of age. Disparity created by families having more votes is minimal, as family sizes tend to reduce as prosperity increases, and in fact this provides families with children with a better footing in terms of social welfare and so on.

Here comes the smart part: not everybody, say the naysayers, is interested in participating in all votes and claim to be apolitical. Traditional voting systems provide for two exposed functions for interacting with ballots: abstaining (or voting blank, which for our purposes can be considered the same), or selecting an option.

The third option, that eliminates much abstinence from apolitical people, is to allow voters to proxy their votes, essentially selecting any third party to cast a vote on their behalf. This type of representation can be on a per-bill basis, categorical, or total, and it can be revoked at any time.

Giving people the ability to defer to their peers in this way creates a highly dynamic system in which every single organizational structure ever seen in human history exists as a state: parliamentary governments are a state in which a small fixed number of people get votes proxied to them in equal measure; dictatorships or monarchies are the state in which all people grant one person with their vote (either directly or indirectly), and direct democracy is where nobody grants anybody their vote. None of these situations is incredibly likely, as the number of possible states within this system are approximately two to the power of the number of voters.

11.3.5 Executive system

Since the economical system has been restructured in such a way that personal gain need not be enacted by way of greed, it is perfectly reasonable to remove the concept of government entirely. Private entrepreneurship can be trusted to fulfil all the roles of government without fear of there being inequality; as long as private individuals and collectives thereof operate in accordance to the law which they themselves have created, and conduct their affairs in whichever way will garner them the most trust outwardly, all traditional functions of government are void save for a few.

The purposes of police and military can be replaced by private security contractors, the purpose of foreign affairs ministries can be replaced with trade agreements enacted by syndicates, embassies operated as social centres, and so on.

Such “privatization” must not be misconstrued as the same kind of privatization we’ve seen in propertarian governments in previous decades, where banks, telephone companies and television networks have been placed wholesale into the hands of profiteering individuals for a fraction of their value, but rather, it is closer to the ideas of the anarcho-syndicalist ideas of free association and collective effort to solve problems facing society or individuals within it.

11.3.6 Judicial system

There not being any government poses a problem to all the lawyers and judges out there: without there being an executive authority to decide who they deem is capable of being impartial in every possible dispute, the entire system of jurisprudence may falter. Nobody has the authority to select a judge – or, perhaps it is everybody who has that authority.

Social contract or law may cause disputing factions to elect judges to try their case. An example of a method of electing judges would be that the disagreeing parties would find the subset of the trusted network wherein all members are four (to pick a number) or more steps from themselves, and six (to pick a number) randomly selected members from that set are asked to act as judges. These people need not be lawyers, rather they would pass judgement based on their convictions in light of the law, perhaps enlisting lawyers they would hire to be *their* legal counsels: the disputing parties would pool to pay for the proceedings.

With these changes it is not hard to envision an equally networked model for education, health care, and so on. By utilizing the nature of the trusted social

network we can effectively build a system that makes no assumptions about the correct structure of society, allowing natural structure to emerge. It may, at the end of the day, be similar or identical to our current system, but at least then we'll know.

11.3.7 The Curtain drops

Let's be clear: These are not idle thoughts. Many of these systems are being tried, none of these ideas are new. It is the context that they are given that provides them with novelty. The software required to enact these changes is rapidly coming into existence, there are social movements popping up all over to enact these changes. They're not inevitable, but it'd take a *force majeure* to derail this train.

And it is here that the narrator leaves the stage and takes a seat amongst the audience, and the audience becomes the stage, as the interactions of the actors become the deepest plot of the most amazing drama, the most horrible tragedy, the most delightful comedy, the best story ever. And this is no myth: this is humanity, we are here, now, doing our thing, dancing to our tune, together.

I write these final words from the trenches of a complex network of revolutions where our only opponents are our own broken assumptions and the horrifying systems that run on them. But rather than being muddy and stinky and littered with our fallen comrades, these trenches are digital landscapes of unending variety, a tribute to human creativity. They are the hallmark of all we have accomplished.

All around us the ancient strongholds of broken systems are falling. In Iceland, where I live, our government just crumbled and a new one has taken its place, a left wing liberal environmentalist government headed by a lesbian socialist, and it looks like a few months down the road we may start drafting a new constitution, where direct democracy might be the result.

In Belgium, yet another government has failed; in the United States a liberal black progressive president just took office in the middle of a financial crisis that may dwarf the Great Depression. In Thailand people have taken matters into their own hands, in India there are calls for general strikes. In Sweden, youth movements are squatting empty buildings in the middle of a housing crisis. In Afghanistan people are fabricating equipment to mesh together wireless networks, unleashing the power of the Internet. In Zimbabwe the currency has become so devalued that all currencies have been made equally valid, in neighbouring Malawi the government has decided to ignore the World Bank's demand that agriculture not be subsidized, and have surplus yield for the first time in decades.

Throughout the world the story is the same: our capacity for self-governance is being uncovered, in part due to lessons learned from the Internet and the social movement that runs it. Hackerdom and its particular kind of meritocratic anarchism, having birthed the free software movement, the free hardware movement, and the free culture movement, having liberated technologies, built the largest encyclopaedia ever seen, and revolutionized communications and computation in every way – having done all that, our movement is now moving into wider pastures and tackling the broken foundations of our society itself. And it's about time.

We're here to change the world, nothing more. This is how it starts. Good luck.

A

Links

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2. http://ur1.ca/f6me http://www.debian.org/doc/maint-guide/ch-dreq.en.html#s-rule
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