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Introduction: P2P and the Commons

Peer to peer social processes are bottom-up processes whereby agents in a distributed network can freely engage in common pursuits, without external coercion. It is important to realize that distributed systems differ from decentralized systems, essentially because in the latter, the hubs are obligatory, while in the former, they are the result of voluntary choices. Distributed networks do have constraints, internal coercion, that are the conditions for the group to operate, and they may be embedded in the technical infrastructure, the social norms, or legal rules. Despite these caveats, we have here a remarkable social dynamic, which is based both on voluntary participation in the creation of common goods, which are made universally available to all.

Peer to peer processes are emerging in literally every cranny of social life, and have been extensively documented in the 5,000+ pages of documentation at the Foundation for Peer to Peer Alternatives, and many other places on the Web.

P2P social processes more precisely engender:

- 1) **peer production:** wherever a group of peers decided to engage in the production of a common resource

- 2) **peer governance:** the means they choose to govern themselves while they engage in such pursuit

- 3) **peer property:** the institutional and legal framework they choose to guard against the private appropriation of this common work; this usually takes the form of non-exclusionary forms of universal common property, as defined through the General

Public License, some forms of the Creative Commons licenses, or similar derivatives.¹ These new property forms have at least 3 characteristics: first, they are aimed against the private appropriation of the commonly created value. Second, they are aimed at creating the widest possible usage, that is, they are universal common property regimes. Third, they keep the sovereignty with the individual.

The third aspect is why peer property fundamentally differs both from private property and collective property.

Private property is individual but it is exclusionary: it says 'what is mine is not yours'. But state or collective property is also exclusionary, in another sense: it says 'it is ours, but it means that you no longer have the sovereignty. It's from us, regulated by a bureaucracy or representative democracy, but it is not really yours'. The collective has taken over from the individual, and more often than not, coercion is involved. But the General Public License and the Creative Commons licenses are different. Common property is not collective property. Using them, the individual gets full attribution, that is, the recognition of his personal property. You are freely sharing your sovereignty with others. This is especially clear in the Creative Commons licensing schemes, where the individual gets a whole gamut of options for sharing. You remain fully in control, that is, 'sovereign', and there is no coercion involved.

It is important to note that peer production is a form of 'generalized', on non-reciprocal, exchange. It is not a gift economy, based on direct exchange or obligation. So peer production is not to be equated by cooperative production for the market: participation has to be voluntary, there is no direct reward (but many indirect rewards) in the form of monetary compensation. The process itself is participative. And the outcome is similarly free, in the sense that anyone can access and use the common resource. In reality, most peer production projects are intertwined with a smaller core of people who may get paid, and use finances to create an infrastructure so that the peer production may occur.

The conditions for peer production to emerge are essentially: abundance and distribution. Abundance refers to the abundance of intellect or surplus creativity, to the capacity to own means of production with similar excess capacity. Distribution is the accessibility of such abundant resources in fine-grained implements, what Yochai

¹ See www.gnu.org/copyleft/gpl.html and creativecommons.org

Benkler (2005) has called modularity or granularity. Again we could talk about the distribution of intellect, of the production infrastructure, of financial capital.

It is important to distinguish two spheres. In one sphere, our digitally-enabled cooperation, reproduction of non-rival knowledge goods, such as software, content, open designs, takes place at marginal costs, and there is only no loss by sharing, but actually a gain, through network effects. Such free cooperation can only be hindered 'artificially', through either legal means (intellectual property regimes) or through technical restrictions such as Digital Rights Management, which essentially hinder the social innovation that can take place. In this sphere, a non-reciprocal mode of production becomes dominant, since resources are not rival, and you are not losing, but gaining, through giving. In the sphere of material production, where the costs of production are higher, and we have rival goods, we still require regimes of exchange, or regimes of reciprocity. Notice that in a sphere of virtual abundance, where copying is trivial, there is no tension between supply and demand, and hence no market.

Peer production, though embedded in the current political economy and essential for the survival of the cognitive forms of capitalism, is therefore essentially post-capitalist. Essentially because it is outside wage dependency, outside the control of a corporate hierarchy, and does not allocate resources according to any pricing or market mechanism.

Peer governance is post-democratic, because it is a form of governance that does not rely on representation, but where participants directly co-decide; and because it is not limited to the political field, but can be used in any social field. Peer governance is non-representational, and this is essentially so because what the networked communication affords us is the global coordination of small groups, and therefore, the peer to peer logic of small groups can operate on a global scope. Hierarchies, the market, and even representative democracy, are all but means to allocate scarce resources, and do not apply in the context where abundant resources are allocated directly through the social process of cooperation. However, since the pure peer to peer logic only fully functions in the sphere of abundance, it will always have to insert itself in the forms that are responsible for the allocation of resources in the sphere of material scarcity. Peer governance based leadership seems a combination of invitational leadership, that is, the capacity to inspire voluntary cooperation, and a *posteriori* arbitrage based on the reputational capital thus obtained. However, the process of production itself is an emergent property of the cooperating networks.

Peer property is a post-capitalist form of property because it is non-exclusionary, and it creates a commons with marginal reproduction costs. There are two main forms of peer property. One is based on the individual sharing of creative expression, and is dominated by the Creative Commons option which allows an individual to determine the level of sharing. The other is applied to commons-based peer production, and takes the form of the General Public License or its derivatives or alternatives, and requires that any change to the common, also belongs to the common.

The conditions for the expansion of peer production

Peer production naturally occurs in the sphere of immaterial production. In this sphere, the access to distributed resources is relatively easy. Large sections of the population in the Western countries are educated, and can have a computer at their disposal. And the costs of reproduction are marginal.

The expansion of peer production is dependent on cultural/legal conditions. It requires open and free raw cultural material to use, participative structures to process it, and commons-based property forms to protect the results from private appropriation. Hence a circulation of the common obtained, through which peer production virally expands (Dyer-Whiteford 1999).

However, peer production is not limited to the sphere of immaterial production. Physical resources can be shared, if they are available in a distributed format. For example: computers and their files and processing power. Cars can be pooled. Money can be pooled as in the P2P financial exchanges such as [Zopa](#) or [Prosper](#). Desktop manufacturing and personal fabricators may lower the threshold of participation, creating more modularity and granularity in newer fields. In fact, we may observe that the same tendency to miniaturization, which led to the networked computer, is taking place in the domain of physical machinery. Coupled with the energy crisis and a dwindling natural resource base, this will most likely lead, in the coming decades, to a new equilibrium that favours relocalized production.

For processes where physical production requires access to centralized financial capital, for example the production of cars, it is entirely conceivable to split the

immaterial design phase from the physical production space. This is already being applied by for profit entities. [Innocentive](http://www.innocentive.com)² is an early example of this. In fact, in reference to the above, it is entirely possible to conceive of the growth of a combination of global-local open design communities, with a built-only capitalism in terms of physical production.

Finally, the relationship between physical objects, logical space, and digital identifiers may be changed, so as to promote commons-based approaches. The white-bicycle experiment in Amsterdam failed, because the scarce physical resource, the bikes, could not be tracked and protected. But commons-owned bicycles can be tracked [through RFID](https://en.wikipedia.org/wiki/RFID)³. In fact, there is now a thriving field of social cooperation, which some call the adventure economy, emerging for the sharing of physical goods.

Such expansion is not just a natural extension of technical evolution, but has structural and therefore political impediments. The centralized capital formats of contemporary neoliberal anti-markets obviously impede such expansion. But even with such constraints, the scope for the expansion of peer production is significant. Again, we will make the following caveat. In the immaterial sphere, non-reciprocal peer production is likely to become dominant. In the field of scarcity, we will see the rise of peer-informed modes of production. This means that markets forms are starting to change, changing from a logic of pure capitalism (making commodities for exchange, so as to increase capital), to logics where the logic of exchange is subsumed to the logic of partnership. Think about fair trade (a market subjected to peer arbitrage), social entrepreneurship (profit used to sustain social goals), base of the pyramid inclusional capitalism, and the many political-social movements that aim to divorce market forms, from the infinite growth logic of capitalism, such as the natural capitalism movement in the U.S.

Adaptation of cognitive capitalism to peer to peer

Peer production, governance and property are more productive economically, politically, and in terms of distribution, than their statist and for-profit counterparts, because they filter out all the less productive forms of motivation and cooperation,

² See www.innocentive.com

³ See en.wikipedia.org/wiki/RFID

and retain only passionate production and intrinsic motivation. In most cases, distribution beats decentralization and centralization as the best way to deal with complexity. In many cases, distributed systems will adapt centralized and decentralized features that will make participation more efficient.

This creates the law of asymmetric competition, which says that any for-profit entity, using closed proprietary formats and no participation, will tend to lose out to for-profit institutions that can draw on communities. Think Explorer vs. Firefox. As a corollary, any for-profit entity (and any nation in its public policies), which adapts open/free, participatory, and commons-oriented elements (as do the open source software companies), will have key advantages as well. This ensures the social adoption of peer to peer logics in the core of our economy.

So far, empirical evidence suggests three emerging forms of adaption between the sphere of peer to peer cooperation, and the institutional and market fields.

The sphere of individual sharing, think YouTube, where sharers have relatively weak links to each other, creates the Web 2.0 business model. In this model, an ethical economy of sharing, co-exists with proprietary platforms which enable and empower such sharing, in exchange for the selling of the aggregated attention. The sphere of commons-oriented peer production, based on stronger links between cooperators, think Linux or Wikipedia, usually combines a self-governing community, with for-profit institutions (Apache Foundation, Wikimedia Foundation, etc...), which manage the infrastructure of collaboration, and a ecology of businesses which create scarcities around the commons, and in return support the commons from which they derive their value.

Finally, crowdsourcing occurs when it is the institutions themselves which attempt to create a framework, where participation can be integrated in their value chain, and this can take a wide variety of forms. This is generally the field of co-creation.

We must note that monetary value that is being realized by the capital players, is – in many if not most of the cases, not of the same order as the value created by the social innovation processes. The user-producers-participants are creating direct use value, videos in YouTube, knowledge and software in the case of commons-oriented projects. This use value is put in common pool, freely usable, and therefore, does not consist of scarce products for which pricing can be demanded. The sharing platforms live from selling the derivative attention created, not the use value itself. In the

commons model, the abundant commons can also not be directly marketed, without the creation of additional 'scarcities'.

What does all of this mean for the market sphere? It is now possible to create all kinds of use value without, or with only a minimal, intervention of capital. We are dealing with post-monetary, post-capitalist modes of value creation and exchange, that are both immanent, i.e. embedded, to the market, but also transcendent to it, i.e. operating outside its boundaries. Two, capital is increasingly dependent, and profiting in all kinds of ways, from the positive externalities of such social innovation. Three, the full, partial, or hybrid peer production models that we discuss above, may be collectively sustainable as value creation processes, but do not offer a direct solution for the income and survivability of the participants.

So the challenge can be described as follows: first, we have a process of social innovation which creates mostly non-monetary value for the participants. Second, we may have an increasingly huge gap between the possibility of creating post-monetary value, and the derivative exchange values that are realized by enterprise. Third, the participants engaged in such passionate production and innovation, mostly cannot find in such processes an answer to their own sustainability.

Hence, the impossibility to realise more than just a small partial monetary value, from the point of view of most commercial players. And the increasing precariousness for the participants of social innovation. In other words, the current market model does not have a reverse process of redistribution for the value that is being created.

This might of course be a temporary crisis, but we do not believe it is. The reason is that the market can only indirectly and partially provide monetary compensation for processes which are not motivated by such compensation. What we need therefore are more general redistributive processes that allow society and the market to give back part of the value that is being so created. One possibility is the further development of transitional labour market measures (protect the worker, not the job), which recognize the flexibility and mobility of contemporary careers. But this needs an important add-on development: the realisation that contemporary workers are moving not just from job to job, but also from jobs to non-jobs, and that in fact, what is most useful and meaningful for them (and the market, and society) are not the paid jobs for the market, but the episodes of passionate production. It seems to me therefore that a more general measure, not linked to the job, but conceived as a

repayment for, and enabler of, social innovation, is needed. The name of that general measure is most probably some form of basic income.

The conditions for the expansion of peer governance

Peer governance functions because peer production is the macro-scale coordination of a large number of micro-production teams. Within the teams, decision-making is participative and consensual, and the global coordination is voluntarily accepted and today technically feasible. Small tribes, the victims of civilizational hierarchies, are re-enabled in the new format of affinity-based cyber-collectives.

Positively, peer governance expands the sphere of autonomy-in-cooperation to all social fields. Its promise is that production becomes a non-hierarchical process. But as I said earlier, peer governance is 'post-democratic' because it is non-representational.

The negative constraint is the following: peer governance requires a priori consensus on the common object. But society as a whole lacks such consensus by definition: it is a decentralized collection of competing interests and worldviews, rather than a distributed network of free agents. Therefore, for society at large, there is no alternative to a revitalized democratic polity based on representation. However, just as the market can inspire itself and be reformed by P2P or partnership-based principles (as in the fair trade that is subjected to peer arbitrage), so we can have peer-informed formats of multi-stakeholder based global governance. And in any case, the sphere of autonomy, that is, of pure governance, can substantially expand even within the strictures of democratic government.

P2P theory as the emancipatory possibility of the age

Our current political economy is based on a fundamental mistake. It is based on the assumption that natural resources are unlimited, and that it is an endless sink. And it creates artificial scarcity for potentially abundant cultural resources. This combination of quasi-abundance and quasi-scarcity destroys the biosphere and hampers the expansion of social innovation and a free culture.

In a P2P-based society, this situation is reversed: the limits of natural resources are recognized, and the abundance of immaterial resources becomes the core operating principle. The vision of P2P theory is the following:

- 1) the core intellectual, cultural and spiritual value will be produced through non-reciprocal peer production;
- 2) it is surrounded by a reformed, peer-inspired, sphere of material exchange;
- 3) it is globally managed by a peer-inspired and reformed state and governance system.

Due to these characteristics, peer to peer can be said to be the core logic of the successor civilization, and is an answer and solution to the structural crisis of contemporary capitalism. Indeed, because an infinite growth system is a logic and physical impossibility with a limited natural environment, the current world system is facing a structural crisis for its extensive growth. Currently consuming 'two planets', it would need four planets if China and India would obtain equity with the current Western levels of consumption. Because of the ecological and resource crisis that this causes, the system is ultimately limited in its extensive expansion.

However, its dream for intensive development in the immaterial sphere is equally blocked, since the sphere of abundance and direct social production of value through peer production, creates an exponential growth in use value, but only, say, a linear growth in the market opportunities in its margins.

The current world system is facing a similar crisis to that of the slave-based Roman Empire, which could no longer grow extensively (at some point the cost of expansion is greater than the benefits of added productivity), but could not grow intensively either, since that would demand autonomy for the slaves. Hence, the feudal system emerged, which refocused on the local, where it could become much more productive and grow 'intensively'. Serfs, who were tied to the land but now had families, a fixed part of their produce, and a much lighter taxation load, were substantially more productive than slaves. The lords took a substantially lesser part of the surplus. Today, extensive growth is ultimately blocked, but intensive growth in

the immaterial sphere requires a substantial reconfiguration which largely transcends the current system logic.

Similarly, the current structural crisis causes a reconfiguration of the two main classes (just as the slave owners had to become feudal lords, and the slaves had to become serfs). At present, we see the emergence of a netarchical class of capital owners, who are renouncing their dependence on the present regime of immaterial accumulation through intellectual property, in favour of a role as enablers of social participation through proprietary platforms, which cleverly combine open and closed elements so as to ensure a measure of control and profit, while knowledge workers are reconfiguring from a class that was dissociated from the means of production, to one that is no longer dissociated from its means of production, as their brains and the networks are now their socialized means of production. (However, they are still largely dissociated from autonomous means of monetization.) It would be fair to say that, currently, peer production communities are *collectively* sustainable, but not *individually*, leading to a crisis of value and widespread precariousness amongst knowledge workers.

The solution would in my opinion point in the following direction: first, the private sector recognises its increasing dependence on the positive externalizations of social cooperation, and together with the public authorities, agrees to a new historical compromise in the form of a basic income; this allows the sphere of cooperation to thrive even more, creating market benefits. Second, the sphere of the market is dissociated from infinite-growth capitalism (how this can be done would require a separate article, but the key would be a macro-monetary reform, associated with a new regime that extends the production of money from private banks to the social field, through open money systems). Third, the sphere of peer production creates appropriate 'wealth acknowledgement systems' to recognize those that sustain its existence, and systems exist which can translate that reputational wealth in income.

Peer governance and democracy

As peer to peer technical and social infrastructures such as sociable media and self-directed teams are emerging to become an important if not dominant format for the

changes induced by cognitive capitalism⁴, the peer to peer relational dynamic will increasingly have political effects.

As a reminder, the p2p relational dynamic arises wherever there are distributed networks, that is, networks where agents are free to undertake actions and relationships, and where there is an absence of overt coercion so that governance modes are emerging from the bottom-up. It creates processes such as peer production (the common production of value), peer governance (the self-governance of such projects) and peer property (the auto-immune system which prevents the private appropriation of the common).

It is important to distinguish the peer governance of a multitude of small but coordinated global groups, which choose non-representational processes in which participants co-decide on the projects, from representative democracy. The latter is a decentralized form of power-sharing based on elections and representatives. Since society is not a peer group with an a priori consensus, but rather a decentralized structure of competing groups, representative democracy cannot be replaced by peer governance.

However, both modes will influence and accommodate to each other. Peer projects which evolve beyond a certain scale and start facing issues of decisions about scarce resources, will probably adapt some representational mechanisms. Representative and bureaucratic decision-making can and will in some places be replaced by global governance networks which may be self-governed to a large extent, but in any case, it will and should incorporate more and more multi-stakeholder models, which strives to include as participants in decision-making, all groups that could be affected by such actions. This group-based partnership model is different, but related in spirit, to the individual-based peer governance, because they share an ethos of participation.

Towards a Partner State approach

Partner state policy is an approach in which the state enables and empowers user communities to create value themselves, and which also focuses on the elimination

⁴ See blog.p2pfoundation.net/category/cognitive-capitalism

of obstacles. The fundamental change in approach is the following: in the modern view, individuals were seen as atomized. They were believed to be in need of a social contract that delegated authority to a sovereign in order to create society, and in need of socialization by institutions that addressed them as an indifferentiated mass. In the new view however, individuals are always-already connected with their peers, and looking at institutions in such a peer-informed way. Institutions therefore, will have to evolve to become support ecologies, devising ways to create infrastructures of support.

The politicians become interpreters and experts, which can guide the issues emerging out of civil society based networks into the institutional realm. The state becomes a at least neutral (or better yet: commons-favorable) arbiter, that is, the meta-regulator of the three realms, and retreats from the binary state/privatisation dilemma to the triarchical choice for an optimal mix between government regulation, private market freedom, and autonomous civil society projects. A partner state recognizes that the law of asymmetric competition dictates that it has to support social innovation to its utmost ability.

An example I recently encountered was the work of the municipality of Brest, in French Brittany. There, the 'Local Democracy' section of the city, under the leadership of Michel Briand, makes available online infrastructures, training modules, and physical infrastructure for sharing (cameras, sound equipment, etc.), so that local individuals and groups, can create cultural and social projects on their own. For example, the Territoires Sonores project⁵ allows for the creation by the public of audio and video files to enrich custom trails, which is therefore neither produced by a private company, nor by the city itself. In other words, the public authority in this case enables and empowers the direct social production of value.

The peer to peer dynamic, and the thinking and experimentation it inspires, does not just present a third form for the production of social value, it also produces also new forms of institutionalization and regulation, which could be fruitfully explored and/or applied.

Indeed, from civil society emerges a new institutionalization, the commons, which is a distinct new form of regulation and property. Unlike private property, which is

exclusionary, and unlike state property, in which the collective 'expropriates' the individual; by contrast in the form of the commons, the individual retains his sovereignty, but has voluntarily shared it. Only the commons-based property approach recognizes knowledge's propensity to flow everywhere, while the proprietary property regime requires a radical fight against that natural propensity. This makes it likely that the commons-format will be adopted as the more competitive solution.

In terms of the institutionalization of these new forms of common property, Peter Barnes, in his important book *Capitalism 3.0* (2006), explains how national parks and environmental commons could be run by trusts, who have the obligation to retain all (natural) capital intact, and through a one man/one vote/one they would be in charge of preserving common natural resources. This could become an accepted alternative to both nationalization and deregulation/privatization.

I would surmise that in a successor civilization, where the peer to peer logic is the core logic of value creation, the commons is the central institution that drives the meta-system, and the market is a peer-informed sub-system that deals with the production of rival physical products, along with a pluralist economy that is augmented with a variety of reciprocity-based schemes.

A renewed progressive policy centered around the sustenance of the Commons

What does it mean for the emancipatory traditions that emerged from the industrial era? I believe it could have 2 positive effects: first, a dissociation of the automatic link with bureaucratic government modalities (which does not mean that it is not appropriate in certain circumstances); proposals can be formulated which directly support the development of the Commons. Second, dissociation from its alternative: deregulation/privatization; support for the Commons and peer production means that there is an alternative from both neoliberal privatization, and the Blairite introduction of private logics in the public sphere.

The progressive movements can thereby become informational rather than a modality of industrial society. Instead of defending the industrial status quo, it

⁵ See www.wiki-brest.net/index.php/Territoires_Sonores

becomes again an offensive force (say, striving for an equity-based information society), more closely allied with the open/free, participatory, commons-oriented forces and movements. These three social movements have arisen because of the need for an efficient social reproduction of peer production and the common.

Open and free movements want to insure that there is raw material for free cultural production and appropriation, and fight against the monopoly rents accorded to capital, as it now restricts innovation. They work on the input side of the equation. Participatory movements want to ensure that anybody can use his specific combination of skills to contribute to common projects, and work on lowering the technical, social and political thresholds; finally, the Commons movement works on preserving the common from private appropriation, so that its social reproduction is insured, and the circulation of the common can go on unimpeded, as it is the Commons which in turn creates new layers of open and free raw material. These various movements come in the usual three flavours: first, transgressive movements, such as young and old filesharers, which show that the legal regime has to be changed. Second, constructive movements, which create a framework for new types of social relationships, such as the Creative Commons movement, the free software movement, etc. Third, reformist or radical attempts to change the institutional regime and adapt it to the new realities. I personally believe that these movements will not create new political parties, but that these networks of networks will indeed look for political liaison. While peer to peer is a regime that combines equality and liberty and therefore potentially combines elements from various sides of the political spectrum, I believe the left is particularly apt to forge an alliance with the new desires and demands of these movements.

There is also a connection with the environmental movement. While the culturally-oriented movements fight against the artificial scarcities induced by the restrictive regimes of copyright law and patent law, the environmental movement fights against the artificial abundance created by unrestricted market logics. The removal of pseudo-abundance and pseudo-scarcity are exactly what needs to happen to make our human civilization sustainable at this stage. The copyright and patent regimes are explicitly intended to inhibit the free cooperation and cultural flow between creative humans, and are just as pernicious to the further development of humanity as the biospheric destruction.

There is therefore a huge potential for such a renewed movement for human emancipation to become aligned with the values of a new generation of youth, and achieve the long-term advantage that the Republicans had achieved since the 80s in the United States.

Conclusion: What needs to be done?

Let's recall some of our points, and see how the movement *against* artificial scarcity and *for* sustainability intersect:

- We live in a political economy that has it exactly backwards.
- We believe that our natural world is infinite, and therefore that we can have an economic system based on infinite growth. But since the material world is finite, it is based on pseudo-abundance.
- And then we believe that we should introduce artificial scarcities in the world of immaterial production, impeding the free flow of culture and social innovation, which is based on free cooperation, by creating the obstacle of permissions and intellectual property rents protected by the state.
- What we need instead is a political economy based on a true notion of scarcity in the material realm, and a realization of abundance in the immaterial realm. Complex innovation needs creative and autonomous workers that are not impeded in their ability to share and learn from each other.
- In the world of immaterial production, of software, text and design, the costs of reproduction are marginal and therefore we see emerging in it non-reciprocal peer production, where people voluntarily engage in the direct creation of use value, profiting from the resulting commons in a general way, but without specific reciprocity.
- In the world of material production, where we have scarcity, and costs have to be recouped, such non-reciprocity is not possible, and therefore we need modes of neutral exchange such as the markets, or other modes of reciprocity.
- In the sphere of immaterial production, humanity is learning the laws of abundance, because non-rival goods win in value through sharing. In this world, we are evolving towards non-proprietary licences, participatory modes

of production, and commons-oriented property forms. Positive forms of affinity based retribalization are emerging.

- But in the world of scarce material goods, a series of scarcity crises are brewing, global warming being just one of them, that is creating the emergence of negative forms of competitive tribalization.
- The logic of abundance has the potential of leading us to a reorganization of our world to a level of higher complexity, moved principally by the peer to peer logic.
- The logic of scarcity has the potential of leading us to generalized wars for resources, to a descent to a lower form of complexity, a new dark age as was the case after the disintegration of the Roman Empire.

So the challenge is to use the emergent logic of abundance, and inject it into the world of scarcity. Is that a realistic possibility? In the immaterial world of abundance, sharing is non-problematic, and the further emergence and expansion of non-reciprocal modes of production will be very likely. “Together we know everything”, is a rather achievable ideal. In the material world of scarcity, abundance is translated into three key concepts that can change human consciousness and therefore economic practices. The notion of ‘together we have everything’ seems not quite achievable, we therefore need transitional concepts.

The first concept is the distribution of everything. This means that instead of abundance, we have a slicing up of physical resources and the physical means of production, so that individuals can freely engage and act. This means an economy that moves towards a vision of peer-informed market modes such as fair trade (a market mechanism subjected to peer arbitrage of producers and consumers seen as partners), social entrepreneurship (using profit for conscious social progress). Objective tendencies towards miniaturization of the physical means of production make this a distinct possibility: desktop manufacturing enables individual designers; rapid manufacturing and tooling are diminishing the advantages of scale of industrial production, and so do personal fabricators. Social lending creates a distribution of financial capital; and the direct social production of money through software is not far away from being realized in various parts of the world (see the work of Bernard Lietaer (2001); If indeed scarcity will create more expensive energy and raw material, a re-localisation of production is likely, and peer-informed modes of production will be enabled to a much greater extent.

The second concept is sustainability. Since an infinite growth system cannot last indefinitely, we need to move to new market concepts as described by the thought schools of natural capitalism, capitalism 3.0 (Peter Barnes' proposal to use trust as property forms because they impose the preservation of capital), cradle to cradle design, and production processes so that no waste is generated. We need to move to a steady-state economy (see Daly 1973), which is not necessarily static, but where greater output from nature, is dependent on our ability to regenerate the same resources.

The third concept is that of sufficiency or 'plenty'. Abundance has not just an objective side, it has a subjective side as well. In the material economy, infinite growth needs to be replaced by sufficiency, a realisation that status and human happiness can no longer be dependent on infinite material accumulation and overconsumption, but will become dependent on immaterial accumulation and growth. Having enough so that we can pursue meaning and status through our identity as creative and collaborative individuals, recognized in our various peer communities.

Only a rich experience economy can avoid a culture of frustration and sacrifice, and the repressions and unhappiness that such could entail. This experience economy however, will not just be created by commercial franchises, but there will also be the direct social production of cultural value. Businesses and peer communities, enabled and empowered by a partner state, will have to create a rich tapestry of immaterial value, and the thicker the surrounding immaterial value of being, the lighter our attachment to mere having will be.

Appendix I

Summary theses on the emergence of the peer to peer civilization and political economy

1. Our current world system is marked by a profoundly counterproductive logic of social organization:

a) it is based on a false concept of abundance in the limited material world; it has created a system based on infinite growth, within the confines of finite resources

b) it is based on a false concept of scarcity in the infinite immaterial world; instead of allowing continuous experimental social innovation, it purposely erects legal and technical barriers to disallow free cooperation through copyright, patents, etc...

2. Therefore, the number one priority for a sustainable civilization is overturning these principles into their opposite:

a) we need to base our physical economy on a recognition of the finitude of natural resources, and achieve a sustainable steady-state economy

b) we need to facilitate free and creative cooperation and lower the barriers to such exchange by reforming the copyright and other restrictive regimes

3. Hierarchy, markets, and even democracy are means to allocate scarce resources through authority, pricing, and negotiation; they are not necessary in the realm of the creation and free exchange of immaterial value, which will be marked by bottom-up forms of peer governance.

4. Markets, as means to manage scarce physical resources, are but one of the means to achieve such allocation, and need to be divorced from the idea of capitalism, which is a system of infinite growth.

5. The creation of immaterial value, which again needs to become dominant in a post-material world which recognized the finiteness of the material world, will be characterized by the further emergence of non-reciprocal peer production.

6. Peer production is a more productive system for producing immaterial value than the for-profit mode, and in cases of the asymmetric competition between for-profit companies and for-benefit institutions and communities, the latter will tend to emerge.

7. Peer production produces more social happiness, because 1) it is based on the highest form of individual motivation, nl. intrinsic positive motivation; 2) it is based on the highest form of collective cooperation, nl. synergistic cooperation characterized by four wins (both the participants in the exchange, the community, and the universal system).

8. Peer governance, the bottom-up mode of participative decision-making (only those who participate get to decide) which emerges in peer projects is politically more productive than representative democracy, and will tend to emerge in immaterial production. However, it can only replace representative modes in the realm of non-scarcity, and will be a complementary mode in the political realm. What we need are political structures that create a convergence between individual and collective interests.

9. Peer property, the legal and institutional means for the social reproduction of peer projects, are inherently more distributive than both public property and private exclusionary property; it will tend to become the dominant form in the world of immaterial production (which includes all design of physical products).

10. Peer to peer as the relational dynamic of free agents in distributed networks will likely become the dominant mode for the production of immaterial value; however, in the realm of scarcity, the peer to peer logic will tend to reinforce peer-informed market modes, such as fair trade; and in the realm of the scarcity based politics of group negotiation, will lead to reinforce the peer-informed state forms such as multi-stakeholder forms of governance.

11. The role of the state must evolve from the protector of dominant interests and arbiter between public regulation and privatized corporate modes (an eternal and unproductive binary choice), towards being the arbiter between a triarchy of public regulation, private markets, and the direct social production of value. In the latter capacity, it must evolve from the welfare state model, to the partner state model, as involved in enabling and empowering the direct social creation of value.

12. The world of physical production needs to be characterized by:

- a) sustainable forms of peer-informed market exchange (fair trade, etc.);
- b) reinvigorated forms of reciprocity and the gift economy;
- c) a world based on social innovation and open designs, available for physical production anywhere in the world.

13. The best guarantor of the spread of the peer to peer logic to the world of physical production, is the distribution of everything, i.e. of the means of production in the hands of individuals and communities, so that they can engage in social cooperation. While the immaterial world will be characterized by a peer to peer logic on non-reciprocal generalized exchange, the peer informed world of material exchange will be characterized by evolving forms of reciprocity and neutral exchange.

14. We need to move from empty and ineffective anti-capitalist rhetoric, to constructive post-capitalist construction. Peer to peer theory, as the attempt to create a theory to understand peer production, governance and property, and the attendant paradigms and value systems of the open/free, participatory, and commons oriented social movements, is in a unique position to marry the priority values of the right, individual freedom, and the priority values of the left, equality. In the peer to peer logic, one is the condition of the other, and cooperative individualism marries equipotentiality and freedom in a context of non-coercion.

15. We need to become politically sensitive to invisible architectures of power. In distributed systems, where there is no overt hierarchy, power is a function of design. One such system, perhaps the most important of all, is the monetary system, whose interest-bearing design requires the market to be linked to a system of infinite growth, and this link needs to be broken. A global reform of the monetary system, or the spread of new means of direct social production of money, are necessary conditions for such a break.

16. This is the truth of the peer to peer logical of social relationships:

a) together we have everything;

b) together we know everything. Therefore, the conditions for dignified material and spiritual living are in our hands, bound with our capacity to relate and form community. The emancipatory peer to peer theory does not offer new solutions for global problems, but most of all new means to tackle them, by relying on the collective intelligence of humankind. We are witnessing the rapid emergence of peer to peer toolboxes for the virtual world, and facilitation techniques of the physical world of face to face encounters, both are needed to assist in the necessary change of consciousness that needs to be nurtured. It is up to us to use them.

17. At present, the world of corporate production is benefiting from the positive externalities of widespread social innovation (innovation as an emerging property of the network itself, not as an internal characteristic of any entity), but there is no return mechanism, leading to the problem of precariousness. Now that the productivity of the social is beyond doubt, we need solutions that allow the state and for-profit corporation to create return mechanisms, such as forms of income that are no longer directly related to the private production of wealth, but reward the social production of wealth.

Appendix II

How peer production and innovation affect innovation policy

1. the law of asymmetric competition: any corporation or nation, facing a for-benefit institution as competitor, which uses open and free forms of knowledge, participatory modes of production, and commons oriented knowledge pools, will tend to lose to the latter.

2. any nation or corporation using closed proprietary formats of knowledge, cannot rely on participatory communities for co-creation, and does not develop commons oriented knowledge pools, which tend to loose to those who do adopt such practices.
3. therefore, we need partner state approaches and platforms which enable and empower the social production of use value, and mechanisms through which the benefits of private capture of positive externalisation of social innovation, can flow back to the communities to make them more sustainable.

Appendix III

A legal and regulatory framework for the participative society

1. In the immaterial sphere:
 - a) Diminish artificial scarcities in the informational field so that immense social value can be created, and immaterial conviviality can replace the deadly logic of material accumulation.
 - b) Public authorities adapt Partner State policies that enable and empower the direct creation of social value.
2. In the sphere of materiality: Introduce true costing in the material field so that the market no longer creates negative externalities in the natural environment; dissociate the marketplace from the system of infinite material growth.
- 3) Create more distributed access to the means of production (peer-based financing, distributed energy production, etc.) so that the peer to peer dynamic can be introduced in the sphere of material production as well.

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