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The political economy of information production in the Social Web: chances for reflection on our institutional design

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This paper is based on the idea that information production on the Web is mainly taking place within either proprietary- or Commons-based platforms. The productive processes of those two 'workplaces' of information production do share some certain characteristics, but they also have several crucial differences. These two modes of production are discussed here and it is investigated how production is organised in each case. In addition, the paper concludes by articulating the lessons taught by the investigation of the structural relationships of information production for enhancing modern societies' institutional design.

Introduction

The idea that the main body of information production on the Social Web is taking place within either proprietary- or Commons-based platforms is used in this paper as a point of departure. The purpose of this paper is to discuss this seemingly contradictory distinction, focusing on the common characteristics as well as the essential differences of these two modes of production, and it argues that the lessons taught by the investigation of their differences can be of a particular interest to social policy. To become more specific, it is articulated that what sets Commons-based peer production apart from the proprietary-based mode of production—the 'industrial one', according to Benkler (2006)—is its mode of governance and property, whose foundation stones are the abundance of resources, openness, commons ownership and the underestimated, from the Standard Textbooks Economics theories, power of meaningful human cooperation that delivers innovative results, such as the Mozilla Firefox browser, BIND (the most widely used DNS software) or Sendmail

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(the router of the majority of email). This paper's narrative begins with some succinct definitions of the central concepts to the discussion that follows. It is then described how the information production in both proprietary-based and Commons-based platforms is organised, arguing that the latter mode inaugurates an alternative path of economic development—building on Bauwens' (2005a, 2005b) triptych of peer production, governance and property. Concluding, it is claimed that the processes of Commons-based peer production can offer interesting insights for a more productive and meaningful institutional design of the modern, information-based societies while new technological capabilities, such as desktop manufacturing, are developing.

Why 'information production'?

In the present context, the term 'political economy of information production' connotes the study of the structural relationships of information production and how they can affect political institutions and outcomes. In other words, the processes of production, distribution and consumption of information and their relation with law, culture and social policy are all put under examination. Particularly, the focus is on the production that is happening with the aid of the so-called Web 2.0, Read/Write Web or Social Web, which facilitates the ground for user-generated content (Benkler, 2006).

It is important to highlight that although the concept of 'information production' does not explicitly refer to the processes of consumption and distribution, here the aforementioned term is related to all of them. This is so for numerous reasons. Following Karl Marx's work—centrally *Das Kapital I* (1867) and its basis the *Grundrisse* (1858) (Marx, 1992, 1993)—we become familiar with the significant impact of the relations of production to the formation of the socio-economic reality, which at least as a heuristic insight about the causes and consequences of the social living-together has not lost its interpretative utility today. Moreover, in *Grundrisse*, Marx argues that the typical value chain, which includes the processes of production ('the generality'), distribution ('the particularity') and consumption ('the singularity'), is 'admittedly a coherence, but a shallow one' (Marx, 1993, p. 89): things are much more complex than they seem, especially in immaterial production.

Information is circular, in the sense that it is both input and output (in order to write a paper, other papers are required) to its own production (Benkler, 2006), therefore it becomes very difficult to distinguish production, distribution and consumption of information. Actually these processes are completely interwoven: the 'value chain is transformed to the point of being entirely unrecognizable' (Bruns, 2008, p. 21). For instance, in the ecology of information Commons, there is a 'seemingly endless string of users' who act incrementally as content producers and gradually extend and improve the information present in it (Bruns, 2008, p. 21). As Bruns (2008, p. 21) writes, 'whether in this chain participants act more as users . . . or more as producers varies over time and across tasks; overall they take on a hybrid user/producer role which inextricably interweaves both forms of participation'. Hence, the traditional

understanding of production becomes rather a particular branch of production, with information production as a social body that is active 'in a greater or a sparser totality of branches of production' (Marx, 1993, p. 86).

The Social Web and participatory platforms

'Social Web', 'Read/Write Web' or 'Web 2.0' are terms that refer to a relatively new set of Internet applications that facilitate user-generated content and use certain media-producing technologies, such as HTML5, CSS 2.0 and Ajax, which make Web services (in combination with the advancement of Internet connections) lighter and faster. These technologies contribute to the functionality of the Web, transforming it into a smooth navigation, interaction and production platform (Porter, 2008; Kostakis, 2009). The present paper prefers the term 'Social Web', as it addresses better the social character of the participatory architecture which is a result of the cumulative changes that those technologies enabled. According to O'Reilly (2006), the Social Web induces social creativity, collaboration and information-sharing among users, who can own data on a site and exercise control over it. It gave rise to several business ventures such as Facebook, Flickr, MySpace and YouTube, which generate huge profits. For instance, in October 2007, Microsoft bought 1.6% of Facebook for US$246 million, and a year later, Google Inc. reached a deal to acquire YouTube for US$1.65 billion (Kostakis, 2009). These proprietary-based, but participatory, platforms create sharing/aggregation economies that are not Commons-oriented. Users share or contribute information, which can be either a product of their own or just someone else's creation, most of the time with non-monetary motives such as enjoyment, recognition, reputation and knowledge (Benkler, 2011). However, generally speaking, they do not directly or consciously participate in order to create common products: they are not part of a certain project that follows certain rules and has set goals to produce relatively clearly defined results in an ecology of common ownership, as happens in Wikipedia or in Free/Open Source Software (FOSS) projects. Platform owners make money from the aggregated attention function, mainly through advertising (for example, MySpace) or based on the Freemium model (for example, Flickr), as explained by Anderson (2009), or in other cases they exploit the collective intelligence for their interests. The latter is well-summarised in Howe's (2006) words—'it's not outsourcing; it's crowdsourcing'—in a *Wired* article that brings to the fore cases from the network television market to companies such as Procter & Gamble or Boeing. A combination of the aforementioned practices or other innovative (for example, think of eBay, which is actually an intermediary that creates markets by enabling and exploiting users' interactions, or of Amazon, which is an e-shop with integrated participatory technologies) or traditional models (for instance, a typical e-seller) are also possible. On the other hand, the Social Web technologies and the Internet in general have given rise to the sphere of information Commons; think of FOSS (Ubuntu, Mozilla Firefox, BIND, Sendmail, Apache, etc.) or Wikipedia. Those projects are developed around communities of users on Commons-based platforms, which are quite autonomous, and their results belong to the Commons pool. Nevertheless, under certain conditions, those

communities appreciate the involvement of for-profit entities as they can offer support and thus strengthen the Commons sphere (Bauwens, 2005a, 2005b, 2007). In the next two sections, the processes of information production within both proprietary-based and Commons-based platforms are described in more detail.

Proprietary-based platforms

Graham (cited in Kleiner & Wyrick, 2007) states that there are mainly three roles one can assume in the Web: the professional user, who is an advanced participant in Web production with monetary incentives, amongst others; the amateur user, who plays a significant role, especially in proprietary-based platforms' production (and who is discussed here in detail); and the final user, who is not eager to take part directly in Web production and just distributes and/or consumes information. Two other categories can be added: that of the benevolent 'white hat' hacker, who, following Wark's (2004) and Levy's (2001) spirit, carries some characteristics of the professional (i.e. profound and specialised knowledge) and some of the amateur (i.e. participation on a non-profit basis, mostly induced by motives such as knowledge, communication, romanticism or reputation; it can be either some or all of them); and that of the malicious 'black hat' hacker who has criminal intentions.

In the years of the early Web, amateur users, i.e. those who were willing to participate in the production but who lacked the necessary knowledge to handle the convoluted means of production, were incapable of producing mainly due to the early architecture of the Web interface (Porter, 2008; Kostakis, 2009). Following the argument developed by Kostakis (2009), the formation of the amateur class as a class comes with the advent of the Social Web, when the amateurs start to have (more) control over the means of production and become capable of interacting (more) with each other. In the early Web, there was a surplus population eager to participate in production (Kostakis, 2009). Therefore, building heuristically on the class theory developed in Marx's work, through which one can really gain some insight into the structural reality of the Social Web, it could be argued that the reserve army of the early Web was composed of loose amateurs who had not yet formed the amateur class, as happened later in the Social Web. In the same vein, the reserve army of the Social Web still consists of some amateurs who are not advanced enough to participate in information production. This is the latent part of the working population, which consists of those who are not yet fully integrated into Social Web production. The producing amateurs, no matter their age, are regimented in platforms, either proprietary- or Commons-based, and organised in networks, while platforms are being smoothed in order to enable participation for the surplus population. With the advent of the Social Web, the exploitation of collective intelligence and creativity has been reborn, regardless of whether it is profit- and/or Commons-oriented.

Amateurs, who are at the core of proprietary-based platforms' production, remain dependent on the owners of the platforms in the same way that the owners are dependent on amateurs, who add value to the business ventures (Kostakis, 2009). This does not imply that a hacker or a professional does not use platforms, such

as Facebook or Flickr, adding value to them; however, as mentioned above, it is the amateurs who came to the fore in the Social Web. The owners of the platforms can be considered as the Social Web capitalists, who renounce their dependence on the current regime of information accumulation through intellectual property and become enablers of social participation. They combine open and closed elements in the architecture of their platforms to ensure a measure of profit and control (Bauwens, 2005a, 2005b, 2007). The production of proprietary-based platforms leads, amongst others, to two types of economies: the sharing/aggregation economy and the crowdsourcing one.

In sharing/aggregation economies, for instance YouTube or Facebook, users share creative content while the owners of the platform sell their aggregated attention to advertisers (Kostakis, 2009). Moreover, platforms like Flickr make money not only from advertising, but also from the so-called Freemium model: users, who share their creations through a platform of aggregated attention, want to gain benefits from more services and pay subscription fees for getting a pro account (Anderson, 2009). But still, aggregated attention is normally a precondition for a Freemium model to work (for example, it could be assumed that subscribed users have joined the Flickr platform that includes thousands of people interested in photography, and thus the former can share and exhibit their work to a large community). Even the search engine of Google—which is not standard any more, as it depends on highly relevant advertising and thus produces very personalised results based on users' surfing behaviour (Pariser, 2011)—gains its competitive advantage from its capability to exploit the vast content created by users, as the ranking algorithm depends on the shared links towards, say, a webpage (Brin & Page, 1998). And like Flickr, Google makes money from both advertising and Freemium (it sells special services to companies). Also, with the advent of the Social Web, a torrent of user-driven pornographic sites, like YouPorn or Redtube, has been unleashed, where users share pornographic videos and photographs arising ethical issues such as that of privacy (for example, one can upload a sex video with one's ex-girlfriend or ex-boyfriend with a revenge motive) or of child pornography. These proprietary-based platforms generate profits from combining the advertising and the Freemium models. Therefore, in sharing/aggregation economies it is basically the aggregation function and/or the Freemium model that generates profits for platforms owners. However, following Pariser (2011), it should be emphasised that the shared content and users' behaviour have recently become a commodity for the owners of proprietary-based platforms, like Google or Facebook, which, in an effort to maximise the effectiveness (and thus revenues) of advertising, try to learn increasingly more about users and provide targeted, personalised advertisement: 'a perfect reflection of our interests and desires' (Pariser, 2011, p. 12). All this leads, according to Pariser (2011, p. 14), to a filter bubble and 'a world constructed from the familiar … a world in which there is nothing to learn'.

Crowdsourcing economies are not very different to the sharing ones because there users still 'share', in a way, content, which is information. However, in crowdsourcing, the main recipient of users' input is normally the company itself. It is the shared content that contributes directly to firms' main functions and thus to profit

generation. Compared with the sharing/aggregation economies, the profit motive for users here is a bit stronger, mainly in the form of a prize. Howe (2008) offers case histories such as iStockphoto, a community-driven source for stock photography, and InnoCentive, where firms offer cash prizes for solving some of their thorniest development problems. Other crowdsourcing platforms are the 99designs or the DesignCrowd, which both deal with design (from logo design to T-shirt design).

In the Web literature, one can find a myriad of different understandings and interpretations of timely concepts and buzzwords, such as sharing economy or crowdsourcing. In this paper, the first simple distinction is made on the basis of the 'workplace' of information production (proprietary- and Commons-based platforms) and then of the business model that is followed in each case (sharing/aggregation economy and crowdsourcing, which are quite relevant concepts). In essence, platform owners, who are crucially dependent on the trust of user communities, exploit in different ways the aggregated attention and the input of the networks as they enable it (Bauwens, 2007). As Bauwens (2007) points out, platforms like YouTube, Flickr or Facebook are dangerous as trustees of the common value that is created due to their speculative nature and the opaque architecture (closed source) of their platforms. The former stands for sharing/aggregation economies, because in crowdsourcing, most of the times, the rules and the processes are quite clear: users produce value for firms, and they get certain prizes or rewards in exchange (sometimes they may get nothing more than the pleasure of contribution). According to Rushkoff (2007), crowdsourcing can be understood 'as kind of industrial age, corporatist framing of a cultural phenomenon'. A company sees this phenomenon positively as 'this new affinity group population to be exploited as a resource' (Rushkoff, 2007). No common value is created, in contrast to many cases of the sharing/aggregation economy where users' input results in the creation of vast common-use value.

The Social Web exhibits both emancipatory and exploitative aspects, and the role of the users, whether they be amateurs, professionals or hackers, is to foster one over the other. It may seem that users give up some rights to the owners of the platforms to receive the chance to create, interact and satisfy their higher needs (Kostakis, 2009). On the other hand, the owners aim at maximising the aggregated attention in order to generate profit. Is this really a win–win situation, or can users do more as key agents of social change? This remains to be answered in the following sections where the sphere of the information Commons will be discussed.

Commons-based platforms

The modern history of information (or digital) Commons, i.e. socially created value that belongs to the public domain, begins with FOSS in the mid-1980s. Later, forced by the rapid development of the Internet, it is Wikipedia, Peer-to-Peer (P2P) file-sharing systems and platforms driven by voluntary communities like LibriVox that came to the fore. The Social Web is emerging, unleashing torrents of information to the public domain under Commons licences (think of the Creative Commons Licenses or the General Public Licenses): from the blogosphere to alternative

media hubs such as Indymedia or even the controversial WikiLeaks, and from the Internet Archive platform to several openly accessible, peer-reviewed journals. A huge number of the aforementioned projects, such as FOSS or Wikipedia, are developed through the collaboration of dispersed communities of volunteers organised in Commons-based platforms, i.e. platforms not owned by a private entity geared towards profit maximisation, but which are owned by non-profit entities (take, for example, the Wikimedia Foundation that supports the Wikipedia project or the GNU project initiated by the Free Software Foundation). It is important to emphasise that there is a difference between profit maximisation, which may have several negative externalities to society, and profit generation, which can contribute to the sustainability of a collaborative project.

The term 'information Commons' conceptualises the deep affinities amongst all these forms of online collaboration and helps validate their distinctive social dynamics and generalise them as significant forces in economic and cultural production (Bollier, cited in Laisne *et al.*, 2010). In this study, Commons-based platforms are considered to be those 'workplaces' of information production where users consciously participate in meaningful projects, producing use value and certain products for the public domain. The incentives are mainly non-monetary (Chakravarty *et al.*, 2007; Lakhani & Wolf, 2005; Ghosh, 2005; Benkler, 2006; 2011), similar to those of the sharing/aggregation economies (i.e. reputation-building; the pleasure of communication; knowledge and experience-gaining; fun, etc.) with one main difference: volunteers share the crucial principles of a common vision and participate in certain production processes enriching the Commons sphere. In addition, they normally belong to communities with stronger ties than those, if any, of the communities of proprietary platforms (Bauwens, 2007). The processes of information production in Commons-based platforms have some certain characteristics which are embraced by the term 'peer production'.

According to Benkler (2006), peer production is a more productive system for immaterial value than the market-based or the bureaucratic-state ones. It produces social happiness as it is based on intrinsic positive motivation and synergetic cooperation (Bauwens, 2005a; Benkler, 2006). Benkler (2006) makes, amongst others, two intriguing economic observations which challenge the mainstream understanding of Standard Textbook Economics (STE). Commons-based projects serve as examples where the STE's assumption that in economic production the human being solely seeks profit maximisation is turned almost upside-down: volunteers contribute to information production projects, gaining knowledge, experience, reputation and communicating with each other, i.e. motivated by intrinsic positive incentives. This does not mean that the monetary motive is totally absent; however, it is relegated to being a peripheral concept only (Benkler, 2006; Kostakis, 2009). Many aspects of human expression, according to Benkler (2006, p. 461), 'are replete with voluntarism and actions oriented primarily toward social–psychological motivations rather than market appropriation'.

The second challenge comes against the conventional wisdom that, in Benkler's (2006, p. 463) words, 'we have only two basic free transactional forms—property-

based markets and hierarchically organized firms'. Commons-based peer production can be considered the third one, and it should not be treated as an exception but rather as a widespread phenomenon, which, however, for the moment, is not counted in the economic census (Benkler, 2006). 'Worse,' as Benkler (2006, p. 463) highlights, 'we do not count them [social production processes] in our institutional design.' In STE terms, what is happening in Commons-based projects can be considered, as Bauwens (2005a) maintains, 'only in the sense that individuals are free to contribute, or take what they need, following their individual inclinations, with a [*sic*] invisible hand bringing it all together, but without any monetary mechanism'. Hence, in contrast to markets, i.e. the holy grail of STE, in peer production the allocation of resources is not done through a market-pricing mechanism, but hybrid modes of governance are exercised, and what is generated is not profit but use value, i.e. a Commons (Bauwens, 2005a, 2005b). In essence, bottom-up innovation, collaboration, transparency, participation, sharing, community accountability, common ownership of the results, and intrinsic positive motivation are key aspects of peer production (Kostakis, 2009, 2010, 2011a, 2011b).

Commons-based projects typically flourish in states of abundance, which is arguably a natural, inherent element of information in contrast to the conventional understanding of immaterial production. The latter, through the introduction of intellectual property (IP) in the form of strict patent and copyright law, constantly tries artificially to create scarcities in order to generate profit. IP supporters claim that it offers the necessary motives, i.e. the profit/revenue motive, for information production and innovation to occur. However, there is a vast amount of literature critical of the concept of IP (for instance, Lessig, 2004; Boldrin & Levine, 2007; Patry, 2009; Bessen & Meuer, 2009; McLeod, 2007; Burrell & Coleman, 2005), which maintains that IP is actually a government grant that leads to private monopolies, and can be extremely dangerous for social innovation, culture and society, and calls for change in institutions and laws. For example, Boldrin & Levine (2007) try to show through theory and cases that IP is unnecessary for innovation, and it damages growth, prosperity and liberty. In addition, McLeod (2007) offers an account of examples where IP laws stifle creativity, privatising many forms of expression (from human genes and public space to guitar riffs), arguing that the blind embracing of enclosure is against the human right of free speech and common resources. Echoing Lessig (2004), Benkler (2006) makes the point that if this IP amok continues, then the works, say, of Disney Inc. and Elvis Presley will never enter the public domain in the same way as Mozart or Shakespeare. Further, Patry (2009), based on economic data and socio-economic theories, contributes to modern copyright debates, shedding light on the 'violence' this monopoly control exerts on discourse, arts and innovation, arguing for a copyright law reformation that will promote innovation. Information is a non-rival good with zero marginal cost of reproduction, and as Benkler (2006) notices, the public use of information increases its value creating several positive externalities. It would be useful to mention the recent global demonstrations and campaigns in which both Commons-based foundations, such as Wikimedia and Free Software Foundation, and for-profit companies, such as Google, have been

taking part against the proposed copyright legislations (namely ACTA and SOPA/ PIPA), which try to create artificial scarcities in information circulation and, thus, threaten freedom, social innovation and fundamental human rights (Free Knowledge Institute, 2012) as well as to lead, according to the Free Software Foundation (2012), to a culture of surveillance and suspicion.

The social production occurring in Commons-based platforms is facilitated by free, unconstrained and creative cooperation of communities, which lowers the legal restrictive barriers to such an exchange, inventing new institutionalised ways of sharing, such as the Creative Commons or the General Public Licenses (Kostakis, 2010). These new property forms (described by the term 'peer property' coined by Bauwens, 2005a, 2005b) allow for the social reproduction of peer projects, as they are viewed to be inherently more distributive than both state property and private exclusionary property (Bauwens, 2005a, 2005b; Lessig, 2004). In terms of property, the Commons is an idea radically different from the state one (known also as 'public property'), where the state manages a certain resource on behalf of the people, and from the private property, where a private entity excludes the common use of it (Kostakis, 2009).

The state of abundance in which the Commons-based projects flourish gives rise to new modes of governance as a result of the new productive forces of production, i.e. the combination of means of labour (information and communication technology, ICT) and human labour power (a person's ability to work; in this case mostly brain power), while new relations of productions are developed. Hence, if peer production describes the processes of information production within online, collaborative, voluntary communities which produce common value using mechanisms of self-governance, then peer governance is the way that peer production is organised. It is a bottom-up mode of participative decision-making, where decisions arise from the free engagement and cooperation of producers (Bauwens, 2005a, 2005b). Coffin (2006) mentions some obvious characteristics of successful open-source/peer communities. First, membership is open and widespread, premised on participation. The free collaboration among the members is geographically dispersed, asynchronous and organised in networks. Moreover, projects are transparent, and dialogues among participants are normally recorded, with the materials of projects like Wikipedia subject to open review (often, there are mechanisms for institutional history). Therefore, at first glance, openness, networking, participation and transparency appear as the main characteristics of governance in peer projects (Kostakis, 2010). More closely, these projects do not operate in strict hierarchies of command and control, but rather in heterarchies (Bruns, 2008; Kostakis, 2010). They operate 'in a much looser [environment] which ... allows for the existence of multiple teams of participants working simultaneously in a variety of possibly opposing directions' (Bruns, 2008, p. 26). Heterachies, following Stephenson (2009), bring together elements of networks and hierarchies and are the most relevant organisational structure for peer projects, as they provide horizontal links, which allow for various elements of an organisation to collaborate, while optimising individually several success criteria. According to Bruns (2008), they are not simply adhocracies, but ad-hoc meritocracies

which, however, are at risk of transforming themselves into more inflexible, strict hierarchies. In addition, following Bauwens (2005a, 2005b), peer projects are based on the organising principle of equipotentiality, i.e. everyone can potentially cooperate in a project—no authority can prejudge the ability to cooperate. In peer projects, equipotential participants self-select themselves to the section to which they want to contribute (Bauwens, 2005b).

Further, Stadler (2008) submits that leadership in most Commons-based projects is not egalitarian, but meritocratic:

> Everyone is free, indeed, to propose a contribution, but the people who run the project are equally free to reject the contribution outright. ... The core task of managing a Commons is to ensure not just the production of resources, but also to prevent its degradation from the addition of low quality material.

Moreover, benevolent dictatorships are common (Raymond, 2001; Malcolm, 2008). It can be stated that this concept actually highlights the tensions between hierarchy and equality as well as authority and autonomy in such projects. For instance, benevolent dictatorships can be found in the Linux project, where Linus Torvalds is the benevolent dictator (Malcolm, 2008), or in Wikipedia, where Jimmy Wales holds that role. Coffin (2006) highlights the necessity of a benevolent dictator (who typically is one of the founders of the project), adding that the foundation developers and the early adopters set the project ethos as well. The founder, along with the first members, exercise his/her authority over participants' contributions (for example, Torvalds decides which code will become part of the official release of the Linux project) and/or upholds the right to fork. Bruns defines benevolent dictators 'as ones of several heterarchical leaders of the community, who have risen to their positions through consistent constructive contribution and stand and fall with the quality of their further performance' (interview, cited in Kostakis, 2010). It is obvious that through such leadership roles, these benevolent dictators may need to push through unpopular decisions. As Bruns notes, 'if they abuse that power, theirs becomes a malicious leadership', and what we should expect at this point is 'a substantial exodus of community members' (interview, cited in Kostakis, 2010). Therefore, following Bruns' narrative, 'the continued existence of the project at that moment would depend very much on whether the number of exiting members can be made up for in both quality and quantity by incoming new participants' (interview, cited in Kostakis, 2010). An oft-cited depiction of the governance processes followed in peer projects, especially in FOSS, is offered by the so-called onion model (Nakakoji *et al.*, 2002; Ye & Kishida, 2003). At the heart of the onion is sometimes a single person, the project leader, most of the times the initiator of the project. Also at the centre, supporting the project leader, there are the core members who have more authority than other project developers, having been involved for a long time with serious contribution work (that is why meritocracy is a substantial characteristic of peer governance). Beyond this, there are other roles for contributors varying on the degree of their involvement (say active developers, peripheral developers and bug fixers).

Kostakis (2010) studies the governance mechanisms of Wikipedia in order to obtain a better understanding of the structural relationships of Commons-based information production. It is true that some of Wikipedia's governance processes differ from those of FOSS projects, LibriVox and other content Commons. However, examining the shared affinities amongst such projects, the Wikipedia case served as a good chance to shed light on the basic aspects of governance and management in peer projects. The main conclusions drawn were that peer govern-ance is actually an unfinished artefact that follows the constant reform and refine-ment of social forms within the community. It is a suitable mode to govern large sources, working more effectively in abundance; whereas in the scarcity realm, democratic—in the form of representation—or market-based modes tend to prevail. However, echoing O'Neil (2009), especially in large-scales projects, open participation with an increasing number of participants makes the governance of the project much more complex. Examining the internal battle between inclusionists and deletionists, it was understood that Wikipedia's lack of a clearly defined consti-tution bred a danger for local jurisdictions where small numbers of participants create rules in conflict with others (O'Neil, 2009). These challenge the sustainability of the peer project. During conflicts, persistent, well-organised minorities can adroitly handle and dominate their opponents. The values of communal evaluation and equipotentiality are subverted by such practices. As Hilbert (2007, p. 120) remarks, group polarisation is a significant danger that open, online commu-nities face: 'Discourse among like-minded people can very quickly lead to group polarization ... which causes opinions to diverge rather than converge ... [so], it is very probable that the strongest groups will dominate the common life.' In these cases, transparency and holoptism are in danger. Decisions are being made in secret, and power is being accumulated. Authority, corruption, hidden hierar-chies and secrecy subvert the foundations of peer governance, which are openness, heterarchy, transparency, equipotentiality and holoptism. Moreover, Freeman (1970) argues that in seemingly structure-less groups, hidden structures may impose different things on the rest; this is described as 'the tyranny of the structurelessness'.

Especially when abundance is replaced by scarcity (as happened in Wikipedia when deletionists demanded a strict content control), power structures emerge as peer-governance mechanisms cannot function well (Kostakis, 2010). Hoeschele (2010, pp. 19–20) suggests that there are three ways that scarcity, i.e. 'the condition when available goods do not meet demands', can be generated:

> First, the total amount of a good or service can be reduced. For example, the expansion of market activities may reduce the amount of goods provided by nature (such as clean air). ... Second, barriers can be placed between people and a good. Of potentially many ways to obtain that good, only one or a few may be left available, leading to the creation of a bottleneck. ... Third, new wants or needs can be created, or existing ones modified, so that demand for a commodity exceeds supply. ... All three basic mechanisms not only increase scarcity, but also curtail freedom by forcing increased expenditures on people and reducing available options of how to satisfy their needs.

'Throughout history,' Hoeschele maintains, 'we can conceive of social power as having been based in part on the construction of scarcity.' That is why abundance is a key to Commons-based projects' sustainability (Kostakis, 2011b). Peer production reintroduces, and is based on, the importance of abundance, making evident that social imagination and creativity become unpredictable, since an abundant intellect (i.e. the surplus creativity of people) can have access to resources (information), tools (ICT) and goods (information as final product) (Kostakis, 2011b).

Furthermore, the reintroduction of certain elements of traditional organisation (hierarchy or market) contributes to their sustainability as well (Loubser & den Basten, 2008; Benkler, 2006), whenever there is a need to manage scarcity. A benevolent dictatorship can be the result of spontaneous hierarchy that emerges when important decisions for the project are to be taken, in which the leader/founder, whose sole role is to serve the community, has authority which comes from responsibility and not from the power to coerce (Raymond, 2001; Weber, 2004). These elements are, after all, part of what is understood as peer governance—a heterarchical, hybrid mode of organisation which combines traditional modes of organisation with networked-based ones (Kostakis, 2009, 2011b); or, to quote Weber (2004, p. 189), 'an imperfect mix of leadership, informal coordination mechanisms, implicit and explicit norms, along with some formal governance structures that are evolving and doing so at a rate that has been sufficient to hold surprisingly complex systems together'.

Instead of conclusions: chances for reflection on our institutional design

Light has been shed on the structural relationships of information production with a focus on certain essential concepts for political economy, i.e. labour, property and governance. In proprietary-based platforms, it might seem that there is a win–win model with profit generation for the owners and satisfaction of users' higher needs such as communication, reputation-building and knowledge gain. The owners of the platforms renounce their dependence on the regime of artificial scarcity, celebrating an age of information abundance while enabling social participation. However, as mentioned, the architecture of proprietary platforms combines open and closed elements to ensure a measure of profit and control. This makes proprietary platforms dangerous as trustees of the common use value. Moreover, issues and problems such as privacy and electronic surveillance; exploitation; and online manipulation and control, come to the fore due to owners' speculative nature. Hence, the Internet and its Social Web platforms exhibit both emancipatory and exploitative aspects, and the political struggle of online communities and users should be to foster the one over the other, strengthening the Commons sphere. The Commons-based peer production brings to the fore, amongst others, two ideas which have been consistently neglected in the design processes of the modern institutional systems of Western societies. Firstly, it is the power of human cooperation that becomes evident through the study of the social production which is taking place on the Web. As Benkler (2011) elaborates, the

currently dominant socio-economic paradigm is premised on the idea that humans are driven solely by self-interest, guided by the invisible hand of the market or the iron fist of a centralised government. Benkler draws conclusions from hundreds of diverse studies and uses a large amount of case studies, amongst others many Commons-based peer production projects, to show 'how cooperation trumps self-interest—maybe not all the time, for everyone, but far more consistently than we've long thought' (p. 249). We, as a society, following Benkler's thought, should dedicate 'the next fifty years to the vastly more complex but infinitely more rewarding task of designing the systems we inhabit for the kind of diverse, complex, but overall fair-minded, moral, sociable, and humane beings we in fact are' (p. 249). Furthermore, it was claimed that the concept of abundance, in relation to the emergence of power structures and autonomy, is another idea that the social production of the Web has brought to the forefront. It was argued how abundance resists to the emergence of power structures in the online communities of peer projects, giving rise to new modes of governance, i.e. peer governance. It can be also articulated that in the social production of the Web abundance and autonomy seem interrelated concepts: information, inherently abundant with zero-marginal costs, and the cheap ICT, i.e. both essential means of production, are distributed to the people who are eager to contribute to the creation, the advancement and the enrichment of the Commons sphere. Thus, it can be claimed that the productive models, premised on abundance and, thus, autonomy, exemplified by FOSS or Wikipedia, should be counted in the institutional designs in the fore-coming years; wherever it is possible, we should pull down the barriers of artificial scarcity, often set by legal restrictive regimes, enabling abundance. If nanotechnology and engineering succeed in making capabilities such as desktop manufacturing and three-dimensional (3D) printing—a technology which has the potential to transcend mass production, being more flexible, productive, customisable and cost-effective (*The Economist*, 2011a, 2011b, 2011c)—accessible to the masses by dropping the costs (in the fashion of microprocessors evolution since the 1970s), the possibilities for the current information-based techno-economic paradigm become arguably unprecedented, connecting the social production on the Web with the low marginal costs of material production and the do-it-yourself (DIY) culture (for an informative account of DIY and open design movements, see van Abel *et al.*, 2011). Think of collaboratively designing a car, like software, and be able to produce its parts using desktop manufacturing technologies and setting them up, say, like IKEA furniture. Then, what may lie ahead might be, to put it in the Perezian style (Perez, 2002), a 'Golden Age', in terms of innovation, prosperity, development and well-being, built upon creative synergies and alliances amongst Commons-based communities, the market and the state.

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Notes on contributor

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