Open Food Network – A Case Study of Commons Based Peer Production

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'Commons based peer production' is a form of participatory governance that embodies voluntary social interactions, where common value is created and circulated in the form of information (i.e. Wikipedia) and open source software (i.e. Wordpress). This paper examines the articulation of this governance approach in the 'open food' movement. Beginning in 2015, the Open Food Network (OFN) is now a global community, working outside of formal state structures to "turn the food system on its head" by enabling networking and digital transformation of movements for fair and sustainable food around the world. OFN believes that technology, if rooted in an ethic of putting people first, can help unite the many small-scale, local, green and fair farms and food initiatives that are emerging around the world.

Based on a year of participatory engagement in the OFN, this paper explores how commons based peer production (CBPP) as a mode of governance articulates in this global civic network and explores the possibilities for extrapolating this software governance mode to material food networks and sytsems 'on the ground'.

The analysis proceeds as follows. First, I describe CBPP as currently theorized. Second, I introduce the Open Food Network and examine its governance processes by following a particular 'thorny' challenge the network faced in early 2017. Finally I extrapolate from the use of CBPP in OFN software production, and suggest implications of this governance approach in terrestrial (on the ground) food networks and systems.

Commons Based Peer Production (CBPP)

CBPP, as a mode of production distinct from both public and private systems was originally theorized by Yochai Benkler (2002) in relation to information and communications technology (ICT). In contrast to rivalry (scarcity of goods) which generates profit in capitalist systems, CBPP focuses on non-rival production, where production and sharing the created goods enhances, rather than diminishes, value (Bauwens, 2005).

The combination of a 'peer to peer' approach with common ownership results in a unique and progressive governance mode. The 'peer to peer' aspect refers to a relational dynamic in networks where participants take independent action and maintain relationships through voluntary self-aggregation without permission from a particular authority (Bauwens , 2009). In the case of CBPP, this self-aggregation and peer production generates value or products that are held 'in common'. Applied to software, these commons outputs become the open and free inputs for subsequent production and the re-creation of new open and free products in a cycle of social reproduction referred to as 'circulation of the common' (Nick Dyer-Witheford, 2006)

In elaborating CPBB it is important to make a distinction from various other kinds of peer production in Web 2.0 (e.g. Tasrabbit, Facebook, Flickr, You Tube) some of which are often considered part of the 'sharing' economy (e.g. Uber, Airbnb). These may indeed use some form of peers in their production processes, but they do not perform a commons in the sense of non-proprietary institutions. Indeed, such platforms have been described as neo-feudal (Scholz 2012, Scholz & Schneider, 2016) or the 'quasi commons' (Brown, 2012) where individuals participate to exchange something they own. There is no voluntary creation process where something is produced by horizontal networks working 'in common'

Scholars have theorized CPBB from multiple perspectives. Benkler (2002, 2006, 2011) understands CBPP as enhancing the core values of individual freedom and participation in liberal societies. As such, CPBB is part of a new kind of capitalism that co-exists with current state and market institutions. In contrast, others understand CPBB as a radical alternative to capitalism (Hardt & Negri, 2009; Rigi, 2014). These scholars place the commons in a class struggle with capitalism, and see CPBB as a radical alternative which is at constant risk of co-option. A third group embraces both of these perspectives and takes a more reformist view (Bauwens 2005, 2009; Bauwens & Kostakis ,2013) These scholars build on the work of Benkler, but in contrast, theorize CBPP as reforming capitalism. They suggest that CPBB is more efficient and more competitive than capitalist processes and thus in the long run CPBB will 'beat capitalism at its own game' and open up space for post-capitalist economies supported by the state.

Regardless of these different views of its relationship to capitalism and the state, these scholars agree that several key characteristics, outlined in Table 1, distinguish CBPP from dominant industrial modes of production and governance.

Table 1: Characteristics of CBPP Governance

Characteristic	**Commons Based Peer Production**	**Industrial Mode of Production**
Authority and Motivation	No central authority Voluntary participation Social cues and motivations (non-monetary)	Central authority Motivated by prices/wages, commands, profit, competitiveness
Hierarchy and Decision making	Meritocracy Consensus	Bureaucratic Democratic
Distribution of tasks/labour	Participatory & collaborative Inclusionary design features: Modularity, granularity	Central authority assigns tasks and rewards
Quality assurance	Communal validation	Approval of authority
Ownership	Communal shareholding Protected by general public license	Proprietary Controlled by private sector or state

In CBPP individuals freely choose to participate and are free to continue or stop participation as they please. The authority to act resides within individuals who are presented with diverse opportunities for action. Motivated by non-monetary rewards (e.g. skill development, fellowship, a sense of purpose and belonging, pleasure of creation) anyone can join the project and select or define their role(s) based on their own criteria. There are no formally assigned roles in CBPP governance. Participants freely choose the way in which they participate. Further, the CBPP approach fosters diverse participation and inclusion by designing work in finely grained (granular) increments or components (modular) so that participants with limited time or particular skills can participate on their own terms. CBPP governance embraces meritocracy, where leaders for projects are selected because of their ability to accomplish a particular task and decisions are made through consensus. Given this reliance on decentralized and self-selected contributions to the project, successful CBPP gives special attention to developing communal validation mechanisms to integrate these into the whole and defend itself against incompetent or malicious contributions. Finally, while other forms of governance may display some of these criteria, CBPP is further distinguished by its focus on commoning or the generation of

'peer property' (Bauwens, 2009). Rather than being controlled by a group of leaders, the assets produced in CBPP are protected by 'general public licenses' (GPL) to ensure their universal availability. These licenses ensure that the products of CBPP are controlled by neither the private sector nor the state.

Open Food Network and CBPP

To date CBPP has been theorized and debated in relation to various examples of open source software (e.g. Linux, Wikipedia, Enspiral). In this paper, I consider how CBPP articulates in a new global community working to create open source tools to 'move the food movement'. In particular, I draw on on-line discussions and participant observation of OFN to further illustrate the CBPP governance approach. I focus on one particular 'thorny' situation that confronted the OFN global community and 'tested' the commons-based governance approach. Specifically, in early 2017, 'a fox entered the hen house' and a private development firm took action to initiate an OFN 'instance' in the US and set up a trading and networking infrastructure there for local food initiatives using the OFN open source codebase. The case challenged the global OFN community on several fronts and offers an opportunity to explore some of the possibilities and contradictions in the CBPP governance approach. Before turning to the case however, I present a brief description of the Open Food Network structure and global project.

Introducing the Open Food Network

OFN is a global network in the early stages of setting new agenda for global 'technology-enabled' food governance in reaction to failures of both market and state to ensure sustainable and just food systems. Based in civil society, it uses autonomous global cooperation to innovate and proliferate free and open software to support fair and sustainable food systems around the world. Initiated by the Open Food Foundation in Australia, the community's flagship open source project is an online marketplace and logistics platform to connect local producers with local consumers. Focusing on food distribution mechanisms, the OFN platform is a disruptive innovation aimed squarely at market concentration in food supply networks. It provides an easy way for enterprises to find and trade with farmers and consumers and to run their operations while reducing barriers to entry for community and ethical enterprises. The core defining feature is transparency. For example, the end consumers can see who grew their food, how their food was grown and how much the producers at the start of complex 'chains' were paid and how much 'mark up' was taken by the aggregator/hub/store.

Open Food Network (OFN) is part of the response to the increasing sense that there is something fundamentally wrong with our food system. This response, globally, includes people experimenting with new food distribution approaches like food hubs, food co-ops, online farmers' markets, food box programs, buying clubs, community-based farms and more. To OFN it is clear that people have the solutions to improving our food systems, but in order to make a larger impact they need to connect with each other and with consumer-supporters at both local and global scales. Technology, specifically open source software, provides the means to achieve this in a way that is values-aligned with the sustainable food movement. Fundamental to OFN is the belief that technology, if rooted in an ethic of putting people first, can help accomplish these goals by uniting the many, small-scale, local, green and fair farms and food initiatives that are emerging around the world. Through deploying and using the OFN platform, these initiatives can 'join up' to scale up and/or proliferate and strengthen advocacy for food system change everywhere.

Membership

While OFN launched in Australia in June 2015, today there are networks operating in the United Kingdom, South Africa, France, Spain, Norway, India and Canada and new 'instances' actively starting in the United States, Thailand, Italy and Germany, and inquiries from many other places. Recently the global OFN Community has developed a Community Pledge toward formalizing the mutual engagement of the people and entities working together on the OFN. The OFN Pledge outlines four different 'types' of members (depicted in Figure 1):

- ***Affiliates*****:** organizations deploying and maintaining a recognized and branded instance of the Open Food Network platform in their region (often but not necessarily, articulated as a country). They provide OFN as a Commons or 'public infrastructure' for the communities, food producers and food enterprises within their defined region.
- ***Associates*****:** those drawing upon and contributing to the Commons by running a white-labeled instance (ie using the OFN codebase, but called something other than OFN)
- ***Service Providers***: those drawing upon and contributing to the Commons to provide services as a web agency / developer / freelancer / marketing consultant / or selling OFN-based services to clients (ie. offering onboarding or coordination services to food hubs/aggregators).
- ***Contributors***: individuals, organizations or institutions contributing to the Open Food Network project with time, skills and/or money (e.g. developers, designers, academics, food hub managers, farmers, interested consumers, funders)
- ***Supporters****:* other individuals, organizations or institutions supporting the Open Food Network mission but not actively making contributions as described above

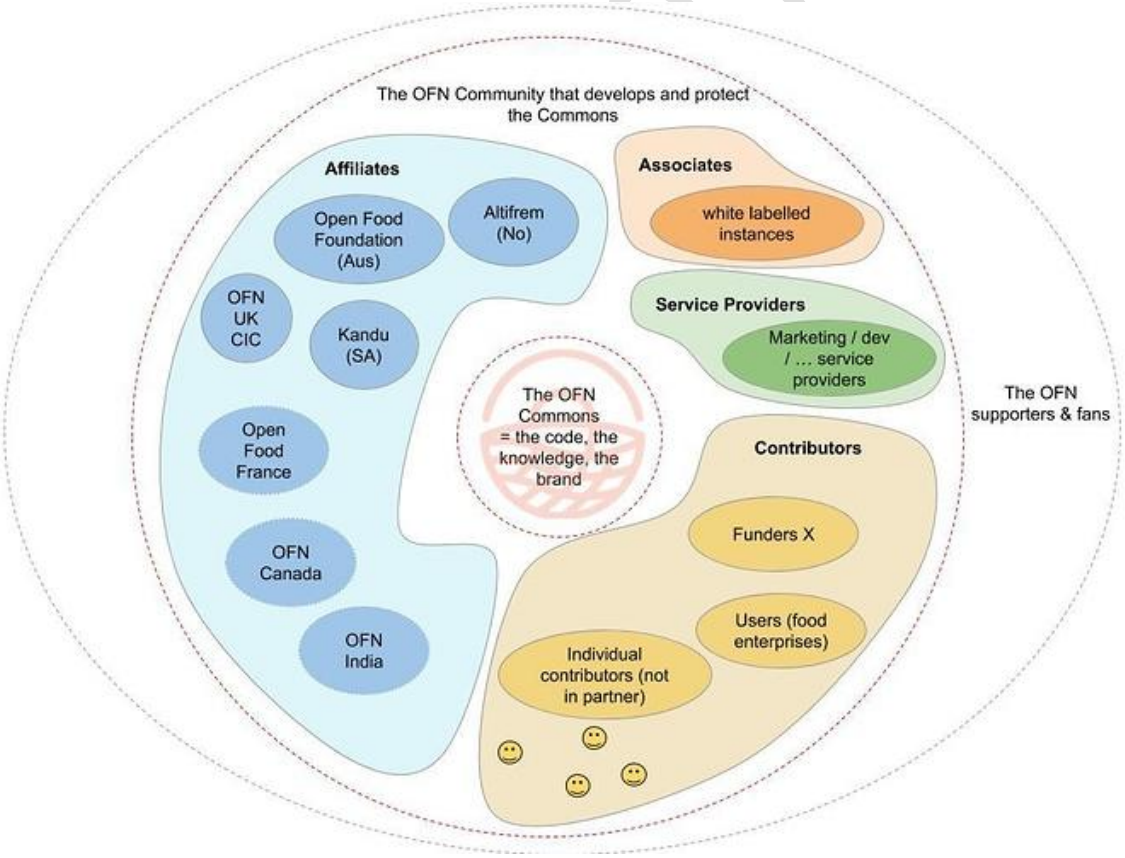

Figure 1: The OFN Global Community

The Pledge details the responsibilities of members and outlines OFN's decision-making process. Affiliates and Service Providers are core OFN partners and are encouraged to contribute to the Commons upon which OFN is based by posting on the community discussion forum, sharing budget and financial models, assisting other members in solving technical or organizational challenges, and providing an annual report or summary of progress on the global community. These members are also expected to contribute to the shared costs of maintaining OFN core Commons by contributing a percentage of their revenue. Affiliates and Service Providers are encouraged to contribute to the management of OFN Commons by participating in decision making processes, taking leadership roles on functions/projects, seeking funding opportunities, and engaging in code improvements. Users of the Open Food Network platform (e.g. hub managers, farm shops, buying clubs or other groups using the platform to operate their initiative) only sign the pledge if they wish to participate in global discussions and decision making.

Governance Tools

The OFN community globally uses a number of free (often open source) technology tools to assist them in their peer-governance approach:

- ***Discourse – https://community.openfoodnetwork.org:*** Technical and non-technical people work together in a wide diversity of discussions aimed at evolving and governing the open food community globally. Participants advance and facilitate discussion threads of interest to them. Topics include: issues of international interest (translating the platform, tracking users and projecting impacts, pay rates for international developers working on OFN code, strategies for funding the open source 'commons' functions, communication and branding, major projects for the year); issues and help for people launching an 'instance' of the platform (configuration settings, security needs and issues, developing terms of reference/user agreements, necessary infrastructure); issues for OFN users (feature list, wish lists for new features, user guides, setting up buying groups); business models (project management, for profit vs not-for-profit uses, piloting and staging); developer discussions (future of spree and OFN, product data synchronization, better logging to help resolve production issues) and so on.

- ***Github: A*** platform that supports workflow for developers. OFN has a developer wiki, which includes technical instructions for setting up a development environment for OFN, along with instructions and tutorials for getting OFN running. The community uses Github extensively for managing new development projects, reviewing code, and integrating newly developed features into the main OFN code. Additionally, the OFN codebase itself is available there for free download.

- ***Slack:*** OFN has multiple 'channels' on Slack, a cloud-based team collaboration platform, where different groups of people work together on different projects. Some of these projects include: improving buying group features, budgeting to maintain the core commons, and developing multilingual features. Access to slack channels is by invitation extended by the channel creator.

- ***Google Hangouts and or Mumble meetings:*** Google Hangout and Mumble are used to facilitate monthly meetings with 'crowd-sourced' agendas and a rotating chair. Recently the community has reached the free limit for Google Hangout participants so they are now beginning to focus hangouts on particular interests (developers, core governance group, instance leads, etc.).

- ***Co-Budget***: Co-Budget is an online platform that helps groups itemize and co-fund projects. OFN uses a system of 'buckets' where new features and other projects are itemized and costs are assessed, then interested parties can make contributions (cash and/or in-kind) to the projects they want to support.

The OFN Platform

The global OFN network of networks attributes the negative externalities of our current food system (health issues, loss of biodiversity and topsoil, antibiotic resistance, low-nutrient food, waste, etc.) to two major root causes. The first is the growing physical and psychological distance between producers and consumers, where people no longer know where their food comes from or how it is produced, the result of which is we do not value our food. The second root cause is the increasing trend towards centralization, concentration and vertical and horizontal integration, which has shifted power from producers to agribusiness, resulting in a handful of multinational agro-industries controlling the food system. OFN addresses these root causes by facilitating the creation and administration of local food ecosystems and by providing transparent information, thus bringing producers closer to consumers and enabling the decentralization of the food system.

The OFN platform is continually evolving through 'co-production'. Designers, developers and coders work alongside farmers and food enterprise managers to identify, code, test and share features that will solve local food system challenges. The code of the platform is open source, released under AGPL3 licence[1] so anyone can use it and build its own project on it, without being part of the OFN community.

The OFN platform enables producers and purveyors of sustainably produced food and value added products to self-organize into local networks and meet the growing demand for healthy, local and green food, at a price that is fair for both producer and eater. Notable features of this platform include:

- It is fully open source: anyone can use the code to build their own project, but any development built on this code must be shared freely and openly.

- It is designed to work with any kind of organizational structure or business model at any scale of operation. Some examples include farmers and producers selling their products directly to consumers, producer groups or farmers' markets who want to distribute their products collectively, distributors and wholesalers who want to restore transparency in their supply chain, and grocery stores, independent shops and restaurants who want to source directly from producers.

- It is transparent, relying on peer to peer traceability. Production methods are made transparent to consumers through a system of labels, and prices are also made transparent. So a consumer can see how much of their payment went to the producer, and how much covered other costs (e.g. transportation, packing, administration).

[1] A discussion of various open source licenses is beyond the scope of this paper. Suffice to say here that this AGPL3 license means that the code be used by anyone for any purpose (including for profit) but if any user modifies the code, the improvements must be re-licensed under open source and made available to everyone.

- It aims to connect distributed and local food networks into food systems, unlike most proprietary e-commerce and logistic platforms, which focus on individual enterprises. Hence the perspective is local sustainable food *systems* that are linked together, versus isolated food hubs or aggregators.

The OFN software platform has a robust set of utilities and tools that are continually evolving. Around the world, OFN leads 'co-production' processes where designers, developers and coders work alongside farmers and food enterprise managers to identify, code, test and share features that will solve local food system challenges. Essentially the current (nascent) platform enables four things:

1) A user (farm, artisan, retailer, food hub or other food enterprise) can complete a profile to be found on a searchable map.
2) A user can set up an on-line shop (wholesale, retail or both), manage product lists/inventories and complete transactions online.
3) Users can organize themselves into groups for collective marketing and selling (e.g. organic growers in a given region, or sustainable meat producers, or a group of farms wanting to co-market).
4) Aggregators (often called food hubs) can set up diverse shops, pick-up sites and delivery routes, and aggregate product from multiple suppliers using real time inventories.

Features are continuously being imagined and created as the OFN global community grows. For example, currently there are discussions about ways to link the 'markets' that are built on the platform around the world with grassroots, digitally-enabled advocacy for food system transformation.

Case Analysis – Initiation of the US OFN Instance

Instances of OFN around the world emerge organically, typically launched by a not-for-profit or association interested in food system transformation. Interested individuals from the US have been engaged in OFN discussions for several years, but none have felt they had the time, skills and/or funds to set up a OFN public infrastructure for sustainable food initiatives to use. In April 2017, a private software development firm introduced themselves to the OFN community, began participating in on-line discussions, and announced they were setting up an OFN instance in the US as part of their business venture.

Initially, the community had no objection to a private sector developer setting up the US instance, and encouraged the firm to collaborate with other US-based OFN participants. In a few weeks however, the firm unilaterally registered the URL 'www.openfoodnetwork.us', obtained private investor funding, announced user fees and installed the OFN code on a server without engaging other interested parties from the US, and without involvement of the global OFN community, thus 'testing' OFN's CBPP governance processes. The discussion that follows analyses how the OFN global community deployed its CPBB governance processes in response, and the possibilities and contradictions that this response reveals. Indeed this 'fox in the henhouse' scenario has been helpful in moving OFN globally from over-celebrating CBPP and being more 'dry-eyed and pragmatic' about its contradictions so they can work to address them.

Non-Monetary Motivations

The response from the OFN global community to the perceived threat of co-option by private forces demonstrates the strength and capacity of voluntary governance by people who share common vision and values. Indeed, the perceived need to act swiftly to avoid a misuse of the OFN 'brand' seemed to further galvanize the dispersed participants, resulting in rounds of posts and exchanges on all

communication channels, including multiple global hangouts and mumbles. In fact, the response generated more participation and engagement from OFN instances from outside the US than engagement of interested parties from within.

It is interesting to note that the OFN community was not concerned about a for-profit firm joining the community and working alongside civically motivated volunteers. Indeed, a number of private development firms work collaboratively in the network. Rather, the initial and primary concern was the unilateral manner in which the private firm proceeded. For the OFN community, collaboration and openness in process are key values as evidenced in post such as:

" *I am extremely concerned about…. unilaterally nominating himself as provider of an OFN named service in the USA, with no discussion / agreement with the community or any engagement with / agreement with pledge etc …",*

"I'm pretty annoyed that he does the thing in his side without really playing the community game and his approach doesn't seem very collaborative".

"They don't sign the pledge [and are] not associated let alone affiliated with the rest of the community"

Within a few weeks, the developer announced to the OFN community that he has launched a website and will host the US OFN instance, and a new concern emerges. The new site does not attribute the code OFN, something that is required by the AGPL3 license, and a common courtesy in open source communities. The OFN community is baffled by this as shown in posts like,

"*Ignore attribution to source? --- I find this particularly perplexing. I have started a 'reasonable attribution' post connected to the pledge and it would be great if you can weigh in on that…"*

"I, personally, don't like to think that while we strive to find money ….. there are for profit instances that take advantage of the code without contributing back"

By July the full situation and intentions of the private firm are clear. The company posts,

".. we have a soft launch for the end of the month… We are in the process of finalizing our 5 year plan for the site … I a willing to help everyone migrate to the platform….. [our investor] is planning on investing $100,000 over the next three years …. we will charge users 2% of their transactions …"

In response, a third motivation rallies the OFN volunteers. They identify the need to protect the commons for potential future food initiatives in the US who, they believe, deserved the same affordable access to technology that is being enjoyed in their own countries/instances. The community worries that privately set user fees will marginalize some potential users, and also damage the OFN reputation. As one poster noted,

"*My biggest concern would be how much he/they would charge people to use it, as that would be the thing that could the most damage etc"*

A week later, a path forward was revealed. Motivated by the strong OFN community interest in acting to protect the OFN commons in the US, another US-based software firm, who had been participating in the OFN community for several months, signed the OFN Pledge and offered to pay one of their own developers to do the technical piece of deploying the US instance, and to work collaboratively with other US partners (not for profits, food initiatives, farms) to create the necessary social infrastructure to

carry the project long term. This marked a compromise for the OFN community. They would prefer that a public instance of OFN is:

"managed and controlled by a cooperative of users rather than a private company. But it seems like in the shorter the initial group of US users want a private company to set up the instance. [The private developer] is very clear that if he sets this up, he would be happy to pass it over to a co-op once it is set up…"

After deliberations the OFN community decides to accept the offer of this second software development company because it is way of ensuring an open and collaborative US instance is established, and in by doing this, they can isolate the first site they feel does not reflect the commons ethic.

Hierarchy and Decision Making

The global OFN community describes its governance system as 'mertitocratic' and following the 'subsidiarity rule'. In this approach those who are best skilled to do a particular task take the leadership role, and each 'affiliate', service provider or platform user determines their own decision making process for the decisions made at the local level, and evolves their own self-governing processes based on the skills assembled. In responding to the need to set up a US instance, the OFN community tried to balance this 'rule' (i.e. US participants should be making their own decisions) with the pragmatic desire to get a public instance up and running quickly to offer an operating alternative to the first, non-collaborative, site.

What evolved might be described as a 'benevolent dictatorship', where the community tried to keep hierarchy to a minimum, but temporarily used strong leadership to avoid project stagnation. Benevolent dictatorships are common in CBPP where participants try to manage the tensions between hierarchy versus equality, and authority versus autonomy (Malcolm, 2008). The community confers leadership on these individuals because of the quality of their past performance and the trust in their commitment to commons principles and ethics. The OFN community however, tries to resist the emergence of top down decision making with one instrumental participant noting for example,

"I plan to take a less proactive role for the time being….when people in the USA are ready to move ……. I am happy to offer the experience i have from other OFN countries, but I want to leave it to you to decide the momentum of this."

However, others in the community are more pragmatic, and describe to the US (nascent) volunteers that when a new instance deploys the OFN platform there are technical (e.g. deploy the code on a server), administrative (e.g. configure currency, taxes, language, weights and measures, product categories) and developmental (e.g. develop a business plan/model, promote the platform, recruit volunteers, seek funding, on-board and train users) functions that all need to happen. The private development firm has volunteered their resources to do only the technical tasks. In the absence of a strong cohort of US volunteers, this left the OFN global community uneasy as they tried to stress through multiple phone calls, hangouts and posts that the technical work was just the first step. The larger and ongoing task was to identify an entity that would facilitate the deployment of OFN across the country on an ongoing basis. The OFN global participants expressed concern that breaking their own subsidiarity rule and setting up the OFN-US in somewhat 'top-down' fashion would not result in a sustainable situation in the long run. As one OFN global participant said,

"*I'll set it up this way for now, but people will need to change it later once they know what they need there*."

This example suggests that there can be tensions in meritocracy when multiple different kinds of skills and experience (merit) are needed. Scholars have observed that open source communities often do not have a clear idea of how merit is 'assessed' or what it really means. (O'Mahony & Ferraro, 2007). This contradiction is revealed in the example of the OFN-US instance where OFN-global participants had the skills (merit) to do the configuration of the platform, but had limited knowledge of the local context (another kind of merit). In the end however, a number of global community volunteers pitched in and did the US instance deployment "*on their behalf*".

Division of Tasks

If leadership is task-based, and there is no central authority, how does anything end up getting done coherently? Indeed as I became involved in OFN, I anticipated chaos and failure in the absence of core leadership. What I found however, was an elegant system of voluntary and collaborative task distribution made possible by the way in which the OFN platform is designed and detailed 'meta' documentation processes volunteers have developed.

The OFN community has a detailed written description of the various 'roles' that need doing at the global level (e.g. various 'types' of developers and designers, global 'greeter' to welcome newcomers, leads on project finances, facilitators for different discussion threads…). As a result, once the community moved to set-up the OFN-US instance, roles was clear and the instance was deployed in a few days. Through a 'US-Instance' slack channel and various discussion board threads all the necessary steps were clearly communicated and documented in open space so that when other US participants joined, they could 'get up to speed' easily.

Two characteristics of the OFN's governance, granularity and modularity, common to most CBPP projects, make division of tasks and engagement of volunteers possible. First, the project (in this case the deployment of the US Instance) is 'modular', or divisible into components that can be produced independently of each other. Modularity allows for pooling of discrete contributions, with different skills and experience, different motivations, different time contributions, and different locations (Kostakis, 2015). This modularized work, disengaged from scale and time, enables diverse participation and efficient completion of project components. In this example, deploying server space for OFN-US, modifying the logo and brand assets for the US, configuring things like state taxes and metrics, ensuring correct workings of the mail servers, testing the platform, and so on, were all completed independently by volunteers with diverse skills, located in different places, but communicating using the OFN on-line discussion board.

Second the complexity or size of the project's modules (granularity) enables a large number of volunteers to join in. Relatively fine-grained or small components are easier for volunteers to accomplish. This helps draw in contributions from people who only have a few hours to contribute to OFN, and encourages participation from a large number of people making diverse contributions. In the case of the US instance deployment, some tasks were small and executed by a volunteer in a few hours (e.g. setting up draft product categories, writing an 'about us' page), while others were more complex and involved several volunteers with specific technical skills (e.g. configuring the mail servers, making sure the US states itemize properly).

Quality Assurance

While the modularity of the OFN project serves to build collaboration and inclusion, it presents a challenge to ensuring quality and project integrity. How do all the parts fit together coherently? Successful CBPP projects need to have low-cost integration mechanisms to ensure the quality of the completed modules and pull them all into an integrated whole. In this way the project can defend itself against either incompetent or malicious contributions. (Benkler & Nissebaum, 2006).

In the OFN community, the development team in Australia who wrote the initial code performs a kind of 'gatekeeping' function. They review code contributions from other developers for coherence before merging with the master code, thus ensuring integrity. However, the deployment of the OFN-US exposed a tension in these processes. The private firm setting up the server had full time paid developers working in a culture that valued efficiency. They wanted to get the work done quickly but the core development group in Australia is not waged employees, and was not always available to review and consult with the salaried developers. Given the Australia group has the most history with deploying OFN instances, their involvement was essential, but they were not as readily available. While it displays some elements of great efficiency, the involvement of multiple volunteers working alongside paid staff resources in CBPP reveals the tensions of work and volunteer cultures colliding. For the OFN Community, this was embraced as a learning opportunity. Based on the experience and feedback from the 'outside' development group engaging for the first time with the OFN code and community, the core development group in Australia established new processes where all projects and development work would be clearly detailed in open space. As a lead Australia developer noted:

"MOST IF NOT ALL projects should be treated as if the developer could get hit by a bus and someone else needs to be able to pick it up and know what's happening, which also means that others can contribute more easily"

While in other communities, volunteers might take feedback from waged workers that they need to be more unavailable as a criticism, the OFN community, guided by an ethic of collaboration for continuous improvement, embraced the feedback as an opportunity to develop better processes. They recognize that peer governance is dependent on self-identification of people for projects, but that for this to work, each community must include a mechanism for integrating the competent modules into a finished product at sufficiently low cost so the process can be sustainable. For them, clear meta documentation and information flow is a governance component that helps balance coordination efficiency and empowerment.

A Protected Commons

On one hand the above aspects of OFN governance can be considered characteristics of many collective action problems, and may seem familiar and intuitive. However beyond voluntary participants taking independent action without permission from a particular authority, a key characteristic is that these processes result in the production of commons based goods. That is, the governance process is directed at producing goods that are neither public nor private.

By setting up an OFN instance in the US, the global community deployed an open tech commons and inviting participants in the US (e.g. firms and farms using the platform, developers innovating on the platform, eaters accessing food using the platform) to join as commoners to perpetuate the this commons in an act of repossession. Beyond being simply an openly accessible 'program' (as Facebook, Twitter or Google for examples) the OFN platform is an example of 'license-enforced sharing' or a 'protected commons' perpetuated by communities of commoners and licensed accordingly. This license (AGPL3) permits anyone to use the OFN codebase as long as the source is

acknowledged, and as long as any improvements to the code are 'played forward' and re-licensed under the same commons license. The license is form of contract, legally enforceable through mechanisms of peer property. So the private software company that has deployed the OFN instance in the US may gain non-altruistic rewards from its deployment of the code, but any changes they make to the code must be re-placed in the global commons. So they can 'capitalize' on the code, but not exclusively. As Bauwens (2008) describes, "peer production creates directly accessible 'use value', created by passionate, 'unalienated' workers, and does not create exchange value". It is this 'copyleft' license that distinguishes open source from 'open innovation' (Kloppenberg, 2014)

Conclusions and Implications

The internet (and associated its communication technologies) is frequently depicted as a super highway on which communications, commerce, politics and governance processes all drive. The highway circulates all our messages about what to eat and avoid for our health, how food is produced and by whom, the ecological, economic and cultural impacts of our choices, and who to praise or blame for any positive and negative effects. As such, the ICT highway shapes our ideas about food systems as both problems and solutions. Further, in a material sense, the highway facilitates trade and strongly shapes which foods are available where and when, from whom and at what price. ICT is part of the complex of social-technical practices that surround food.

However, this ICT is rapidly consolidating into a big toll road that serves to marginalize those without the requisite skills or ability to pay. The Open Food Network is a new global civic community building a set of open lanes alongside the tolls. These lanes are the beginnings of a new public infrastructure upon which food initiatives, networks, systems and movements can assemble, link together, proliferate and engage in both commerce and advocacy for food system transformation. The construction has only just begun. In this paper I have offered an early glimpse into the ways in which the global OFN community uses a commons based peer production and governance approach.

OFN and its articulation of CBPP, like other governance processes described in this issue, offers a promising and hopeful way forward for sustainable food networks and initiatives. Yet, while OFN demonstrates a governance approach that emphasizes solidarity and cooperation over self-interest and competition, it is also a space of political struggle and there are some contradictions to be worked through. This analysis challenges the dichotomy between the material and the immaterial. On one hand, OFN is governing an immaterial 'knowledge commons' of code and software. But the global OFN project was initiated in order to assist sustainable food initiatives and networks 'on the ground' in their very material work of producing, trading, storing, inventorying, transporting actual food products. What can we learn from this digital co-production and commons based governance that might inform the sustainable and fair production and distribution of tangible goods in 'terrestrial' food systems? Further, how might CBPP help with food system transformation?

First, OFN, as described here, manifests and responds to commercial pressures of capitalist economy. Placing privately paid developers alongside volunteers creates the same tensions (such as limited volunteer time) in CBPP as it does in 'alternative' food networks operating in physical spaces. The OFN case however, gives hope as it reminds us of how self-directed, variously motivated people can galvanize together in response to challenges. The attention OFN gives to ensuring modularity and granularity of projects, accompanied by a meticulous attention to documenting processes in order to deepen community engagement, might be instructive to food system projects trying to avoid precarious volunteering and volunteer burnout.

Second, while OFN's governance manifests forms of power and authority that rival 'command and control' approaches, at the same time we've seen how the leadership can be tempted to default to 'benevolent dictatorship' for the sake of efficiency. Yet, the OFN global community is cautious and strongly reflexive about this process. In reflecting on these challenges, participants arrived at a compromise where time consuming deliberation and consensus processes are reserved for important decisions that 'bind' or limit possibilities for future participants. But, decisions and actions that don't eclipse future openness for users can be made expediently by such benevolent dictators. Further, these 'leaders' choose to limit their own power by protecting the OFN platform (from their own actions as well as actions of leaders yet unknown) with open source license. In the absence of either private or public ownership, there are few long term assets for the OFN 'leaders' to 'control' even if individuals were so inclined.

Third, at times a 'digital utopia' narrative loosely permeates OFN discourse, and this raises a contradiction (perhaps the 'elephant in the room') that was not evidenced in posts or discussions in the US-deployment example. While OFN has based its governance processes on social justice and sustainability values, all the physical infrastructure that enables the OFN (e.g. computers, servers) embodies social injustices and ecological instability characteristic of mining and assembling work in the global South (Fuchs, 2013, 2014). Not confronting this contradiction suggests the belief that software development is a symbolic, non-material exchange, independent of exploitation relations and bio-physical constraints in the 'real' world (Pasquinelli, 2008). A non utopian perspective would see the struggle for a free democratic internet and software resources and the struggle for ecological resilience and labour justice as one and the same. Indeed as the OFN expands and deepens engagement with sustainable food initiatives globally, I suspect they will help OFN name and discuss the elephant.

Finally, this case shows how placing resources (in this case the OFN platform) into a peer-governed commons, and protecting that commons with clear license, sets up a project that ensures participation, democratizes engagement and buffers against enclosure by capital. The 'copyleft' licensing is a legal mechanism that enforces sharing not exclusion (Kloppenberg, 2010). Kloppenberg (2014) goes on to describe how the creation of an enforced seed commons is a basis for food sovereignty, since seed is the basis of all food production and harvest. In the age of ubiquitous internet, where all our information about food comes digitally and food-related knowledge and data are increasingly enclosed, I suggest that sovereignty over code, that is, creating a food technology commons is equally important and hence shares a conceptual space with seeds as components of global food sovereignty. In this sense, we can understand farmers and software developers to be in the same struggle for sovereignty over their inputs and creative processes, and code-savers like OFN participants, struggling for a digital commons are tackling the same problems as seed-savers struggling for a natural commons.

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