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Abstract

This paper examines how decisions are made and justified within cultures of contribution using an 'operational pragmatics.'Peer-production and contribution cultures are enfolded in a dynamic of resistance and appropriation in relation to capitalism. Open-source and contribution-based cultural processes have been critiqued as tending towards bureaucracy or becoming enfolded in a never-ending neoliberal imaginary from which escape or transcendence become impossible. An examination of the values expressed within a peer-production community challenges these perspectives and shows how 'operational pragmatics' can provide moral justifications both through reference to matters of principle and of design. Conflating these matters complicates claims about the inherent 'virtues of participation, especially in technical cultures. A qualitative analysis of an open-source hardware project shows how competing moral justifications unfold, and how the challenges that they pose to capitalism may be tenuous because of the way that justificatory regimes work within technology development under capitalism.

Keywords

Contribution culture

Digital culture

Open knowledge

New spirit of capitalism

Repair culture

Introduction

Peer-production and contribution cultures are enfolded in a dynamic of resistance and appropriation in relation to capitalism. The expansion of participatory media production processes, including free and open software development and voluntary sharing of cultural work, have sparked interest in how these forms of collaborative work develop social, cultural and economic value. These cultures include peer-production practices that influenced development of free and open source software (FOSS) (Weber, 2006) before expanding to be used in hardware development (Powell, 2015a) and other cultural products (Jenkins, 2006). Despite continuing concerns about the exploitative aspects of contributed 'free' labour (Terranova 2000) scholars of innovation enthusiastically embraced the idea of peer production as shifting working practices from hierarchy to network (Benkler, 2006), although there has been criticism about how contribution cultures build value for platforms (Gillespie, 2011) without fulfilling their potential for greater democratic participation (Mansell, 2012, Powell 2016). Indeed, it now seems that peer-production has integrated some of the critiques of capitalism and, in some instances, become an exemplar of the new spirit of capitalism focused on project-based work (Boltanski and Chiapello, 2005). Peer-production projects are also engaged in the creation of accessible knowledge and - at least for some - accessible technology. How can these competing aims be held together? What does this imply for the ongoing shifts in the production of technology, knowledge, and culture?

This paper examines how participants in peer production processes sustain competing moral visions for their participation. I argue that moral justifications based on the ideal design and use of technologies can become conflated with normative claims about principles of peer production or accessibility of technology. I follow discussions on an open source project, analysing how the participants position themselves and the future consumers of their products as both good subjects of capitalism and as advocates of openness and flexibility. Through reference to what I refer to as 'operational pragmatics', the set of justifications made in relation to function, their discussions collapse 'good' function of technologies, 'good' (or expert) use of them, and 'good' (or virtuous) principles and practices into regimes of justification.

The moral aspects of justifications are an under-appreciated aspect of the dynamics of peer production in the literature. These moral aspects are important to examine because they challenge the idea that peer production and contribution culture primarily work by legitimating competitive and exploitative forms of knowledge production. In this paper, I show how moral justifications do two kinds of work: justifying a 'new spirit of capitalism' (Boltanski and Chiapello, 2005) and opening out alternatives to it. These alternatives might include considerations of whether technology is designed in order to be repaired (Jackson, 2014) demonstrating the connection between open knowledge and a restructuring of extensive market capitalism. I suggest that the possibility to repair a tool involves both the quality of its function and the openness of the knowledge used to produce it.

I analyse how people working in an open source hardware project advocate for, negotiate, and operationalize moral perspectives. In this community, the pragmatics

are 'operational' – concerned variously with the function of tools and with the justification of particular decisions within a deliberative design process. I examine how argument and action articulate to different moral qualities. These moral qualities align with different ideas about the value of peer production - on one hand, its ability to sustain innovation in the capitalist mode and, on the other, to model the creation and maintenance of common knowledge and the capacity for repair. I show how justifications of goodness based on function can expand –and enfold arguments for the expansion of access to knowledge. People participating and contributing to shared projects negotiate multiple moral engagements that manifest not only in the material or symbolic contributions that they build but also in the regimes of justification that are constructed in language and computer code. An analysis of this pragmatics in an open-source project dedicated to creating an open source mobile phone at the moment of the launch of the iPhone reveals contradictory and intersecting justifications for democratic access to knowledge alongside, and in relation to, the 'new spirit of capitalism' that Boltanski and Chiapello (2005) discuss. Participants justify choices pragmatically, linking 'what works' to 'what is good', making success in markets as important as the other virtues of peer production (Benkler and Nissenbaum 2005).

Peer to peer values and virtues

Peer production, as a form of participatory culture, includes contribution without direct remuneration to cultural products. Forms of peer production include free and open source software (FOSS) as well as alternative communication access networks and other information resources (Dulong de Rosnay and Musiani, 2016). Practices within contribution cultures are not derived from wage labour, and many of them create informational goods that are not strictly commercial market products, instead

producing goods through relationships of reciprocal exchange. These features have suggested an association between contribution cultures and liberal values or virtues (Benkler and Nissenbaum 20015). There are, however, also deeper moral contradictions in these practices. For example, Coleman and Golub (2006) see software production cultures as nourishing an expressive liberalism, rewarding individual contributions and arguing that the ethics of this liberalism are in constant negotiation. Unfortunately, the focus on liberal notions of virtue does not capture how these moral perspectives engage the broader tensions between market competition and open knowledge, suggesting that other perspectives, possibly including the 'moral economy' approaches applied in the context of cultural production by Hesmondhalgh (2017) and others may be fruitful. Benkler (2006) celebrates how peer production could contribute to the establishment of a knowledge commons that has the capacity to challenge the commodification of knowledge. As critiques of this position have pointed out, however, participatory dynamics especially in relation to software development are now fully integrated into the dominant institutional forms of our time and are enfold new spirits of capitalism including celebrations of individual competition and dynamic change (Boltanski and Chiapello 2005). Not only do these new spirits of capitalism provoke different kinds of challenges to, and appropriations of, participatory dynamics, I suggest that these can be understood in new ways by focusing on how people think of their 'goodness.'

Critiques of peer-to-peer

The Bureaucratic critique

The liberal perspective on peer-to-peer (P2P) production has celebrated the capacity of peer-production to allow people to pursue psychologically gratifying labour, create

egalitarian relationships and realize ethical relationships that are nonmarket and nonproprietary. However, Kreiss et al (2010) argue that bureaucracy, rather than altruism, tends to maintain contribution cultures, and how these cultures are often elite and specialized. This critique arguably underplays some of the broader social dynamics that impact on participatory processes. The unpaid contribution of labour now underpins much of the platform-based communication and information environment (as anticipated by Terranova 2004). The bureaucratic critique also tends to overemphasise the democratic and disruptive dynamics of participatory processes which may not be completely recuperated in practice. While participation can become a compulsion (Couldry 2015), contemporary capitalism has also been transformed by its appropriation of participation (Boltanski and Chiapello, 2005). So, while the bureaucratic critique opens the possibility to see P2P processes as capable of being appropriated for un-democratic ends, it is also essential to push forward to understand how challenges to, and recuperation of human creativity within, capitalism might unfold simultaneously.

Dialectic and Moral Critiques

Participation can also be ambivalent and capitalism can appropriate creative energies to its own ends, as other critiques of peer production point out. Grounded in Zižek's (2015) claim that socialist and communist ideas have been negated by neoliberalism, Cammaerts (2011) that participatory practices might challenge neoliberalism by negating Zizek's negation. However, as a dialectic perspective, this presumes an endpoint – and as neoliberalism perceives itself as being a synthesis (through the 'end of history' argument advanced by Fukuyama 1992), the endpoint becomes its continuation. Cammaerts explores this dynamic in relation to the challenge initially

posed by file-sharing technologies to the music market, and the subsequent criminalization of these practices. In this framework, and using this example, no matter how disruptive the peer-to-peer form might be for the neoliberal frame, the dialectic into which it is enfolded always presumes a synthesis into a new form of neoliberalism.

Moral critiques and regimes of justification

By contrast, other perspectives invite consideration of moral aspects of cultural production. Hesmondhalgh and Baker (2010) examine the moral and emotional qualities that workers attach to cultural work, showing how contradictory the explanations and justifications about the value of work can be, mixing delight in the process of contributing work with frustration and anxiety at low pay and exploitation. The ambivalence about feelings of value in paid work highlight the contradictions and moral strains of life under capitalism. Boltanski and Chiapello's (2005) observations about the flexibility of capitalism give us a valuable conceptual lens for analyse how these strains are negotiated: they highlight how different regimes of justification are associated with various forms of social life, observing how people understand their actions to be good or right, and how these understandings connect with what they actually do. Boltanski and Thévenot's (2000) work identifies how phases of social life acquire particular kinds of justification that legitimate and value particular actions. They describe how different social constructions work to create fragile agreements that maintain the tenuous balance of the social world. These 'orders of worth' establish what is viewed as legitimately 'good' within any social formation. This can change over time as Boltanski and Thévenot (2000) write, "we stress the work persons have to accomplish here and now in order to construct the social world, to

endow it with meaning and to confer on it a minimum of firmness . . . [the orders of worth model] aims to account for justifiable states, where justification makes an appeal to common resources that go beyond the situation" (p. 212).

Boltanski and Chiapello (2005) examine various orders of worth and justificatory regimes as they appear specifically in relation to a new spirit of capitalism, that sees natural order in the continuous development of projects and the formation of networks, and that sustains capitalism by positioning critiques of capitalism as projects that are part of its inevitable development. From a moral perspective, these justificatory regimes are understood to dynamically integrate different orders of concern. Operational pragmatics are thus ways that these concerns are ordered, justified and placed in relation to the function of tools and the imagined outcomes for developers and users.

By focusing on the *justification* of particular acts, it is possible to see slippages between 'moral' and 'technical' ideas of goodness. As my case study shows, justifications (especially ones made on the basis of moral claims such as 'goodness') can be advanced for different sets of actions at the same time and with contradictory concerns: technical 'goodness' holds some value for the capacity for people to exercise their capabilities (see Nussbaum, 2001) by being able to understand or repair a smartphone, for example, but other forms of 'goodness' are more contentious. Market competition and commons-based knowledge creation are justified simultaneously, through appeals to different morals or values. My 'operational pragmatics' allows analysis of claims about goodness based on principles such as openness but also on technical function. I suggest that a conflation of these values can undermine and complicate some of the claims in the literature to the effect that peer

production "fosters virtue by creating a context or setting that is conducive to virtuous engagement and practice, thereby offering a medium for inducing virtue itself in its participants" (Benkler and Nissenbaum p. 403). Benkler and Nissenbaum argue that different clusters of virtues appear in relation to peer production: autonomy, independence and liberation; creativity, productivity and industry; benevolence, charity and generosity; and sociability, camaraderie, friendship, altruism and cooperation. In this paper I examine the cluster of creativity, productivity and industry as well as ideas of altruism and cooperation. In many participatory processes, virtues and ethics are negotiated pragmatically, using both linguistic pragmatics (the use of grammatical resources and strategies of argumentation) *and* material practices aligned with practical goals. Coleman and Golub point this out in their observation that peer production facilitates "a rejection of universal ethical rules in favour of an approach that conceives of ethics as the practice of creating values and norms of action" (p. ? 2005). While Boltanski and Thévenot (2005) consider linguistic pragmatics in their discussion of how social perspectives are legitimated, they do not focus, as Benkler and Nissenbaum do, on the practical goals such as well-functioning technologies that often serve as legitimating reference points. This needs redress because the slippage between these forms of pragmatics can conflate means and ends and technical, political and social benefits. While technical 'goodness' can, in some cases, serve normative ends such as expanding access to knowledge or the capacity to resist features of market capitalism by repairing systems and devices, other notions of 'goodness' can reinforce the legitimacy of capitalism. In the case study that follows, I examine how 'operational pragmatics' illuminate the conflation of 'good' function, 'good' argument and 'good' morality, but also how these pragmatics open a potential for other ways of working, particularly through a focus on the conditions under which

technologies can be designed to be repaired which both provides them with 'good' function and keeps knowledge about them open.

Case Study: "The World's First Open-source Smartphone"

In 2006 I was researching hardware hacking. One evening one of my collaborators started to tell me about a new project he was involved in – he was working on an open source project that was designing the world's first open source smartphone. I had only the vaguest idea of what a smartphone was, but he told me that it would be an amazing device, capable of delivering video phone calls, sending email and taking photos. Along with hundreds of others, he was writing code and discussing the project on a mailing list. Best of all, he said, the community's ideas were actually going to be considered in the manufacturing of this phone, because the project leader, a man called Sean Moss-Pulz, ran a family business in Taiwan called First International Computer (FIC). FIC built chipsets, and Sean was a passionate open source advocate who convinced his family that an open source project would mean that product development could happen across a worldwide group of experts and that bugs in prototype code would be reviewed by thousands of people. It would also create a built-in market of expert users. In 2007 the project, called OpenMoko, released its first prototype phone, timed to present an 'open alternative to the iPhone.' One more prototype was released in 2008 before Sean Moss-Pulz stepped down from the project and it ceased producing phones. OpenMoko is currently maintained as a volunteer-led repository of design schematics and software code for use in mobile devices

I followed the project on its publicly-archived discussion mailing lists from February

2007 to October 2008, and analysed list posts accessible via the Internet Archive[1]. My analysis included thematic coding of the discourse in the form of postings and debates, taking the perspective that, in these cases, key discourses are collectively produced (Hardy et al. 2005) and dependent on the creation of particular social and cultural contexts (van Dijk, 2005). Participants are not identified by name here, although the month and year of the posting is included. In this paper, Phillips's (2002) notion of a discourse as an interrelated set of texts, practices of production, dissemination and reception is appropriate, since the list postings create not only discussions, but particular ways of understanding peer-production and its value. After introducing how participants understood and responded to the concept of 'openness', I examine two discussions in detail, both concerning the interplay of function and marketability and a particular focus on definitions of openness. These took place at different times across the span of Moss-Pulz's involvement in OpenMoko including the launch of the iPhone and the OpenMoko prototypes Neo1973 and Freerunner. The historical vantage point also identifies the long-term contributions of the OpenMoko project which influenced the Android open-source software stack and the platform ecology of app development for smartphones (see Powell, 2015b).

Openness and its values

Two dimensions of value co-exist and become enfolded in the OpenMoko project, one celebrating market success and the other open knowledge. These values are celebrated and co-articulated through the principle of openness. Open source electronics is an especially challenging case for applications of peer-production principles and, in

[1]I analysed posts from this period as it spanned the inception of the project through to the production of the first market-ready product. Due to caching issues, the list archives for May, August and September 2007 were missing.

particular, the ideals of open source production which stipulate (in the case of computer software) the accessibility of source code. Many attempts have been made to apply these principles to other areas, but this has caused conflict both philosophically, in relation to the notion of openness (Tkacz, 2012) and, practically, in terms of how 'source' might be defined in relation to material goods (Powell, 2012). The design of consumer electronics and miniaturized devices also depends on numerous proprietary arrangements of components and non-transparent supply chains for the raw materials required to produce them. Nevertheless, one of the key conceptual justifications for OpenMoko participants was the idea of producing a piece of open source technology.

Participants were united in their enthusiasm for open source processes and products and paid particular attention to the philosophical aspects of the project which was made easier because the mailing list was open to contributions from across the project. Discussions tended to justify openness in terms of personal capacity – either the writer's sense of himself[2] as a person capable of making the most of an open technology (which also had the benefit of securing their status). Openness was also sometimes held up as being good for people who use mobile phones, but this was often inflected by a sense of the participants' own expertise, which they recognized as exceptional but also wished to be more widespread. Most participants presented themselves as experienced in open source participatory projects with some identifying as 'Linux experts' in their signatures[3]. But even in discussions of openness,

[2] It was not possible to know the gender of all of the list posters, but the majority used traditionally male names or identifiers.
[3] Linux is a popular open-source operating system and one of the earliest and largest

participation and competition seemed to collapse into each other. When one set of writers suggested, for example, that the OpenMoko might become an open platform for self-written applications, some suggested that this would only be valuable if the project adhered to the GPL open-source software license setting a higher bar for technical openness. Other writers thought that the main value of advocating maximum openness would be that it would help to compete with Palm and Nokia who were the main smartphone developers at the time. Most often, these musings centred on how 'good' open source projects might be, understood in relation to the qualities of their openness and their accessibility and popularity on a global market. These tensions between principle and function appeared to foreshadow how operational pragmatism was employed to define what would be 'good' or 'better' for the project. If even the broad concept of 'openness' contained ambivalence about 'goodness,' more specific frames of justification appeared in the posts which demonstrate how the kinds of virtues that have been associated with peer-production were developed pragmatically. The following section identifies how participants developed an 'operational pragmatics' that positioned both the normative principles of access to knowledge and the technical features of OpenMoko as 'good'. I use Benkler and Nissenbaum's virtues of creativity, productivity and industry to frame the discussion while allowing the justificatory regimes of the new spirit of capitalism to show through; particularly its absorption of the critiques of capitalism and a celebration of liberation, autonomy, participation and networked ways of working. Operational pragmatics conflate means and ends and the value of principles including, open contribution, open technology, and expertise, as well as the value of the functional smartphone object.

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open-source software production projects.

Virtues and markets

For OpenMoko participants, contribution to the project is frequently a subject of justification, and they describe their expertise as conferring responsibility for acting in a particular way, and for producing 'better' technical tools. To return to Benkler and Nissenbaum's clusters of virtues (which I find generative but perhaps too morally specific compared to my idea of values), 'creativity, productivity and industry' feature significantly for the OpenMoko participants. In some cases, 'good' participation in open processes is conflated with 'good' design of technologies and 'good' (or expert) use of them. In this (rather lengthy) exchange, developers discuss which mobile messaging system they think should be used in OpenMoko, straying, as often happens, into philosophical discussions of the expected benefits of open software for both their own group of experts and for society generally.

This conversation, which took place in February 2007, started with a technical discussion of what messaging protocol the prototype phones ought to use. Like many other threads, it branched into discussions blending value-based declarations about open source, operational decisions about phone design, and validation of community expertise.

One writer asks, rhetorically,

> "Who uses MMS [a mobile messaging protocol]?

Another responds:

> > Only pretty much the majority of actual cellphone users in Europe, based on
> > the market research and carrier requirements I've read...

Sean Moss-Pulz then weighs in with his view on messaging protocols and why the OpenMoko will not use the MMS messaging protocol:

> IMHO [in my humble opinion], only because nobody has given us anything better. We're trying to do that. So I asked the guys to ignore MMS for the now [sic]. If this is an issue I'll put resources on this in the future. Right now, I'd much prefer to see solutions that use GPRS[4] such as? IM / Email / ...

Moss-Pulz appears to defer to the decision-making capacity of the other participants, as the next part of the thread shows. One participant adds:

> >> Seems like the typical user would just email
> >> and attach media and/or just s/ftp [command line code for file transfer]

Another person responds:

> > Typical _Linux_ user, maybe. This is the sort of thing which (in my view)
> > represents something of a disconnect between the goals of "having as open a
> > phone as possible" and "selling a lot of phones"...

Moss-Pulz again cedes authority to the community while also justifying his operational decision:

> You might be right. But I personally feel that MMS is fundamentally flawed. Costs aside, it's just not the way I think media should be transferred. The benefits are just too low for the end user. We're trying to fix this.
>
> Really guys, we're trying to rethink lots of things with OpenMoko. I don't

[4] The standard messaging protocol used in the United States

> want to do the same things just running under FOSS. We'd be missing out on a huge invitation to innovate both as a company and a community. Why not use the flexibility and rethink how we want these devices to work -- as end users -- not just for geeks but for everyone? I'm not saying we'll get things right the first time. Just that we're going to try our best ;-)

Other people in the community then step in to validate this perspective:

> I agree. I have never used MMS, and very rarely use SMS [short messaging; the protocol for text messages]. I use email for just about any correspondence that I have (including to/from my phone). Now, that doesn't mean that I am a representation of the *average* user, but despite its drawbacks email is a much better means of transmitting written communication.

He continues:

> One thing to consider is that even if we can do amazing things, we are still going to have to interact with people using "normal/whatever" phones. So even if SMS/MMS isn't going to be the ideal platform for sending messages we still need to be able to send/receive them. A *better* way to approach the situation is to be able to do something new and cool that "other" phones can't and then use that as a selling point for the OpenMoko/Neo.

These exchanges have the result of validating design decisions as being ‘good’ if they align with the discursive practices of the developers themselves, validating their experience and expertise as determinate of ‘goodness’. Some of these practices and internal values included the idea of doing ‘new and cool’ things, suggesting that the

developers thought of themselves and the users of their phones as innovative technology specialists. Using reference to their own experiences and casting themselves as both expert and potentially representative of some idealized end-users, their technical solutions could help even people with 'normal/whatever' phones to see the value of their design choices. Developers struggle to balance out their appeals to people like them ('geeks'), their hopes for imagined future consumers, and their interpretations of the value of using FOSS methods.

Another thread of exchange follows on from the final paragraph of the first message:

> FOSS doesn't make good software by default. A good user community behind the platform has a chance at making good hardware/software. But it is going to take time and a lot of effort to make great software, and Sean is right that we may not get it right the first time around...
>
> What I mean by not getting carried away is. I don't think that there will be many situations where you can "walk into a room full of people all using the Neo's and...[insert cool idea]." There were over a billion mobile phones shipped out in 2006, and there will be many more in 2007. So even if we get a million of these devices in people's hands we are still at less than 1 percent market penetration. So, we can't create a self contained community that only looks to our selves for ideas. We *must* be able to easily/effectively communicate with those other %99+ of devices out there...even if they are inferior.

Open source virtues are meant to be self-evident, but OpenMoko participants anticipate the extension of creativity and productivity to others through the wide distribution of their smartphone, celebrating its superior qualities compared to other products. The final list posting also tempers the consensus about the quality or value of open-source production, noting that it does not automatically make 'good software'. It confirms that effort needs to go into creating the community and the conditions. This final post, the writer also tries to consider the other people who might be outside the core group of contributors. The writer nuances the assumptions that he and others might have had about the relationship between the 'goodness' of the phone's hardware and software technology and the 'goodness' of the process. The writer of the final post in the discussion concludes:

> At the end of the day, this IS an Open Source project, so anything can be changed if necessary, but (Like a lot of other people on this mailing list, I imagine), I want things to be designed RIGHT, so as to minimize the number of re-writes we have to go through before we get something that can work for the wide variety of people who WILL have a MoKo.

Here, 'rightness' refers to an ideal related to the process, but also to the imagined function of the device. "Rightness" is effective, provides a pragmatic justification in the context of the argument, and demonstrates an effective use of the time and talent of the developers. This effectiveness, grounded in flexibility and personal engagement, seems to align with the ideals of the new spirit of capitalism and what Medosch (2014) has called 'new networked people' who are able to mobilise and self-motivate to work in open source projects.

One of the features of the new spirit of capitalism, according to Boltanksi and Chiapello (2005), is the appropriation of critiques of capitalism into its ideology. Open Moko developers restructure themselves and their imagined future consumers as creators and innovators, advocates of openness and flexibility, but also as good subjects of capitalism. The virtue of altruism that Benkler and Nissenbaum (2005) also looked for in peer-production projects are also present, but enfolded within and alongside the hope that the project will do well by selling lots of phones (which of course would be built on software 'designed RIGHT).' Rightness and goodness are also related to expertise. Judging the goodness of a design becomes more difficult, however, when the design is flawed or needs to be repaired. Software is inherently buggy, and open-source software development avoids the challenges of breakdown by focusing on the efficiency of distributed bug-fixing. With hardware like smartphones, however, the logic of repair becomes more challenging, as open-source projects struggle with the questions of actual accessibility of the materials and design of electronics hardware (Powell, 2014) as well as with the challenges that bugs and other breakdowns pose to the connection between 'good' technology and marketable technology.

Repair and commercialization

For the OpenMoko project, the tensions raised by bugginess emerged after the release of the first prototype phone. This opened up comparisons with the first iPhone, which was released in late 2007. When the OpenMoko phone was released, it did not work very well, and so the discussions on the mailing list turned from ideal features to proposals for repairing software (and hardware) function. This process of repair

within the design process illustrates what Jackson (2014) describes as "an aftermath, growing at the margins, breakpoints, and interstices of complex sociotechnical systems as they creak, flex, and bend their way through time. It fills in the moment of hope and fear in which bridges from old worlds to new worlds are built, and the continuity of order, value, and meaning gets woven, one tenuous thread at a time" (p. 223). Allowing for repair might make it possible for both developers and imagined consumers to share knowledge. For the OpenMoko community, this value and meaning is often wound around their discussion of the 'goodness' of the design as reflected in the capacities of the people who designed it. Phones might be able to be repaired, but they depended on a certain sort of person to be willing to engage with their openness.

Consider the discussion of the phone's keyboard which some participants thought worked poorly. Here, usable features and software are both judged to be 'good' outcomes in part because of their flexibility. One writer recalled the design discussions:

> If I remember correctly, "all" participants of the discussion
> came to the conclusion, that a regular qwerty keyboard is not
> sufficient no matter how clever you "pimp" it, due to
> restriction of precision of finger typing and lack of screen
> space.

Another replied:

i disagree. reality of the . . . predictive keyboard and actual use of it disagrees. talk and theory is fine - actual code . . . is disagreeing.

> users of that code are disagreeing.… in the end the proof is in the pudding. who will go and actually write code. you can have all the ideas in the world, but he who puts them into code and makes them usable by others "wins" :) so don't stop- please, work on alternate input methods. i am going with the one i have seen work, demonstrated live on a Neo and used. (March 2008)

This argument employs a classic form of software-developer rhetoric, 'argument-by-technology' (Kelty, 2005) where making a system that functions (writing 'running code' that executes a program) acts as a persuasive argument for one way of thinking and working. In this case, the argument also gives greater legitimacy to people working on the phone to make it usable, rather than simply discussing – creating a distinction in the group's folk pragmatics.

As the second OpenMoko phone, the Freerunner, came to market in mid-2008, the mailing list began to include many messages from people who had purchased OpenMoko phones and been disappointed. The references to these 'wronged consumers' reiterated a particular set of moral positions related to consumerism and consumption, including expectations that something one buys or pays for works without repair or maintenance. Regular contributors mostly ignored these new posters, trying to bury their frustration with their non-functional devices in detailed discussions of battery life or software upgrades. Yet the wronged consumers claimed the space of moral legitimacy in relation to legitimacy of contemporary market capitalism, strengthening the market dimension of value:

> Third request: what *is* the warranty on the Freerunner?
>
> The warranty is essentially non-existent.
>
> It's supposedly 14 days "D.O.A.". Dead On Arrival, in its strictest definition,

> means that as long as the phone boots up, that's it. It doesn't matter if it's not really functional. As long as it boots up, it's technically not "DOA".
>
> If it can't make phone calls or connect to the internet, too bad: it's not "DOA".
>
> If the GPS antenna doesn't work right, because of a hardware flaw, too bad: it's not “DOA". While I'm glad they're trying to put out a phone that's "open", I'm very disappointed in their lack of customer support. I mean, it's not some throw-away piece of crap. It's a $400 phone!
>
> (August 2008)

As these kinds of postings started replacing the earlier postings that stressed the capacity for open-source processes to challenge or transform competitive and market-based forms of technology production, the capacity of open source to create ‘rightness’ seemed to weaken. The OpenMoko mailing list slowly shifted from a site of intense discussion of open source possibilities to troubleshooting of malfunctioning phones, interspersed with offers to fix bugs and calls to vote on particular future features. Bug fixing, a necessary process in software development, is also more difficult in hardware design, and providing adequate levels of documentation such that people could repair hardware rather than report bugs. Interestingly, it is this turn in the discussion that suggests how peer production’s more radical side might garner greater legitimacy. Faced with a product that could not challenge a commercial market leader, group members turned to focus on processes of repair. Discussions also connected the repair of bugs and failing hardware with the core principles of creating a shared commons of knowledge, and expanding the principles of free software:

> What OpenMoko needs is our help fixing what we can do, while they concentrate on fixing what only they can fix . . .

> Right now a lot of positive action is needed. If OpenMoko "dies" the hardware problems will NEVER be fixed, and the Free Software phone fails totally. (October 2008)

As the OpenMoko project waned, it fragmented. The hardware failed to dominate the market but remained as a project undertaken by a network of participants – maintaining camaraderie by sustaining discussions about how to put open-source values into practice. The software, by contrast, eventually made its way into the Android devices that compete in the smartphone market. This consolidation of open-source work into a commercial product might be seen as appropriation as in the neoliberal critique of capitalism discussed earlier, if not for the fact that many of the OpenMoko community's arguments concerned getting software to function RIGHT in order to share this good functioning with the world. Within the group's own operational pragmatics, the integration of their software was depicted as a triumph of its production process and quality.

Discussion

The OpenMoko community conflated a number of forms of 'goodness', including well-functioning technology, well-made arguments, and well-intentioned social values. The difficulties in sorting out the different elements of this conflation have perhaps influenced the long-term consequences of this project in open source hardware and software development. Android, which appropriated much of the software developed in OpenMoko, uses a 'platform model' to encourage individual contributors (the kinds of people who might previously have participated in an open-source project like OpenMoko) to build apps on a Google platform (Powell, 2015b). App developers are bound by the terms and conditions set for them by the owners of

the platforms and set out in software development kit licenses (SDKs)[5] that define how applications must be programmed. These SDKs can be highly restrictive. Google's Android SDK clearly stipulates that the finished app is the property of Android or parent company Alphabet, not the developer. The OpenMoko community remains divided as to the moral status of this integration with Android: some are enthusiastic about OpenMoko being part of Android because it keeps the software running.

The analysis of the Open Moko case suggests that looking at values in design is not always enough; nor is only examining virtues in terms of the self-development of individuals. The excerpts presented here show how the OpenMoko community developed operational pragmatics that appear to have collapsed liberal political values design principles and specialist expertise into justifications that unfolded in relation to technical and rhetorical claims. This may be one reason that, for all the bluster about the transformative capacities of open-source technologies and participatory processes, they are often limited in their long-term impact. This may be because the participants conflate the 'goodness' of market success with the 'goodness' of accessible source code, and the 'goodness' of an impassioned mailing list discussion. Nevertheless, by treating these as regimes of justification following Boltanski and Chiapello, we can see their social value beyond the individual and beyond the structural process of appropriation into capitalism. Operation pragmatics focusing on function also open a space for the celebration and accommodation of repair, through bug fixing as

[5] An SDK is a set of software development tools that permit the development of an application for a particular platform. An SDK includes tools for technical integration of the application, as well as specifying arrangements for intellectual property and payment relating to application development.

discussed here and, more profoundly, through the release of electronics schematics that permit people to understand and repair their electronics. As a response to a 'broken world', operational pragmatism is a construct which also connects with the capacity for function to become valuable beyond marketability – even if this value was never realized in the OpenMoko project.

Conclusion

Regarding participatory culture's values as virtues expressed within a self-defined liberal space that always tends towards bureaucracy or becomes appropriated or enfolded into an intransigent neoliberalism makes it difficult to acknowledge the way that participatory producers justify and advocate competing moral positions. Some of these positions do indeed celebrate the benefits of competition, depicted in relation to the moral value of building well running things, but others justify their commitment to the openness of knowledge in reference to the same idea of 'working right.' These justifications are not always made on the basis of principle, and they do advance different moral ends.

These moral ends enfold two co-articulating dimensions of value and advance them through operational pragmatics that embed arguments about worth into arguments about function. As this paper has shown, claims about principles like openness are advanced in relation to their benefit to consumers or 'non-expert' users as well as in relation to their capacity to keep knowledge free. While this rhetorical position always embeds some compromise, material considerations like the capacity for repair may hold more capacity to challenge the potential monopolization of the information world.

"Good" technical function contributes to a set of justifications both for the idea of market-competitive products and for the design process remaining open enough that some people (even if expert) might contribute. This demonstrates the enfolding of the two dimension of value – market and commons – as well as the contingency that arises from operation pragmatics framing value in relation to function. The pragmatics advanced by the OpenMoko participants have some expansiveness as concerns repairability but also constraints that stem from the belief in function as paramount. Building phones, like building any digital communication infrastructure, requires constant repair, creating a justification for keeping information resources accessible and beyond the control of monopolies, invoking Jackson's movement at the margins which can opened up by privileging the material practice of repairability.

The expansion of participatory processes has transformed the software and hardware ?production industry. While the analytical focus is often on how the industry appropriates the labour of peer-producers (Gillespie, 2011), the framing of these developments in this paper highlights that this shift comes about through the great accessibility of knowledge about, and participation within, these production processes especially when they are 'open'. Thus, within the operation of platform capitalism there is a baseline of participatory collaboration that is understood and justified by its community members as morally valuable, both because it helps to make things that work *and* because it helps to keep knowledge open. These moral positions, contrary to critical perspectives that stress their recuperation by the market, bureaucracy or the

new spirit of capitalism, hold the potential for an alternative and transformative perspective. Seeing participation only as a means of enacting virtues stops short of seeing how values or virtues are constructed and justified. Regimes of justification can work pragmatically to advance some considerations over others; these can articular different dimensions of value that shape how we apprehend our spaces of communication and culture.

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