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The Handbook of Peer Production

Chapter 4 – Social Norms and Rules in Peer Production

Christian Pentzold, Leipzig University, Germany

1. Introduction

The regulation of peer production projects is usually achieved by the users themselves. Ideally, this self-organization and self-management depend on shared social norms and rules. Some of these institutional arrangements characterize the larger population of peer production projects, whilst others are the attribute of particular projects. The chapter provides an overview and comparison of peer production's institutions, traces their origins, and describes their implications for cooperation and governance.

Peer production is often advertised as a truly alternative form of providing information goods and services, one that is less constraining than hierarchical firms or contractual markets. Hence, voluntary participation and freely available outcomes are taken to epitomize a novel form of libertarian cooperation unfettered by rules and restrictions. This kind of ideal setting of "organizing without organizations," as Clay Shirky (2008) described it, should be characterized by egalitarianism, communal evaluation, and flat, fluid, or even absent hierarchies so as to maximize individual freedom and autonomy (Bruns, 2008; Stevenson, this volume). Peer production does, therefore, not only rest on the freedom of membership and commons goods but is believed to also be freedom-producing (Tkacz, 2016; see also Borschke, this volume; Dulong de Rosnay, this volume). It thus produces free information and services, but also ought to enhance the practice and experience of generosity, altruism, and comradery (Benkler & Nissenbaum, this volume; Firer-Blaess & Fuchs, 2014).

Ideas of independence, voluntarism, and equality, deliberation and self-amending procedures are deeply ingrained in the rhetoric and culture of peer production (Fish et al., 2011; Jemielniak, 2016; see also Bauwens & Kostakis, this volume; Dafermos, this volume).

When considering the actual interactions in projects, these claims seem vastly exaggerated: Free and open source software initiatives like Debian have, for instance, devised extensive ranks and procedural schemes to steer contributors. In Wikipedia, editors complain about cliques and the power plays of an oligarchy of users and they struggle with bureaucracy and formalized rules.

Addressing this discrepancy, it would be too easy to just dismiss the discourse around the virtues of peer production as an ill-founded pipedream that never was in touch with its reality. Instead of decrying the apparent gap between the rationale of peer production as an alternative mode of cooperation and its imperfect practical accomplishment, it is more productive to study the processes through which organizational forms and institutions come into being. That way, the consolidation of norms, codes of conduct, and contributor positions does not arise as an inadvertent setback but can be approached as an inevitable and even requisite development. On these terms, Kreiss, Finn, and Turner (2011) refer to Max Weber's classical sociological thought in order to dismiss the idea that peer production must stand against bureaucracy. Indeed, bureaucracy can protect against arbitrary rule. Loose hierarchies or the absence of rules are, therefore, not per se more egalitarian or democratic because "regulations hold the whims of individual members in check," Kreiss et al. (2011, p. 251) argue. The authority of rules and formalized workflows do not automatically preclude peer production or stifle creativity but are necessary to make it happen. Anarchy has, it seems, never been an option, even though the ordering of peer production projects must not necessarily take the shape of a formalized bureaucracy (O'Neil, 2014). In fact, a key characteristic of peer production institutions is that they are openly debated by participants on mailing lists in Debian or on wiki pages as in Wikipedia.

Institutions enable the conversion of the freedom gained from a number of legal and managerial restrictions into a freedom achieved for productive participation (Berlin, 1969).

This chapter charts and discusses rules and norms as potentially conducive "forms of closure" (Tkacz, 2016, p. 33) in peer production. This sounds oxymoronic, yet it points to a fundamental friction between, on the one hand, the ambition to open forms of cooperation that are less restricted by property rights or hierarchical structures and, on the other, the need to establish rules that close activities set to violate this openness.

The overview offered in this chapter starts from the idea that voluntary, commons-based cooperation needs some kind of ordering and that institutions can help to organize for a freedom of action found within peer production. Following the social constructivism of Berger and Luckmann (1966), the chapter assumes that institutionalization happens whenever people interact in a more habitual manner. Institutions such as norms and rules thus hint at the typification, habitualization, and ordering of social action. De-institutionalization, in turn, occurs through the transition of rules or norms into new contexts or when their original setting changes. Regulations can also be altered by strategic efforts. Furthermore, institutions might be transformed due to conflicting rulings or dissenting normative expectations (Oliver, 1992; Zucker, 1977). For instance, in her study of the Debian community of programmers, Coleman (2013) finds what she calls moments "punctuated crisis" (p. 124). There, the conflicting modes of governance of democratic majoritarian rule, a guildlike meritocracy, and an ad hoc process of rough consensus clash and prompt negotiations and new rulings.

The chapter is organized along a set of questions. The first part asks, why peer production needs any sort of rules and norms. Based on this discussion of institutional conditions, the second part will map what sorts of rules and norms prevail in peer production. It delineates the three institutional levels of policies, guidelines, and basic normative understandings that are geared towards the products and the processes of peer production. Next, the third part examines how rules and norms come into existence and are made to

function. Finally, the chapter reflects whither of peer production's institutions congeal into governance regimes, bureaucracy, and hierarchies.

The chapter mostly refers to Wikipedia and free and open source software projects such as Linux and Debian (see also Couture, this volume; Haider & Sundin, this volume). These paragons showcase the power and potential of peer production. They are taken as reference cases since these mature initiatives provide rich information about the long-term processes of building and transforming institutions for voluntary and free cooperation.

2. Why Rules and Norms? Institutional Conditions for Peer Production

Rules and social norms play an important part in organizing peer production. Given the anonymity, ease of entry, and limited social cues which characterize peer projects, this can be a challenging mission (Resnick & Kraut, 2011). In that respect, institutions can be seen as an answer to the question of "how to steer the integration of dispersed knowledge resources and how to coordinate such activities to the purpose of creating common value" (Aaltonen & Lanzara, 2015, p. 1650). They provide for the collective capability of participants separated in space and time to bundle together the piecemeal contributions and direct them towards the joint production of a valuable outcome. In order to continuously create and ensure collective agency, rules and social norms can rarely be one-time solutions. They have to be adapted to the dynamics of a particular project, for instance, in terms of new user cohorts, content growth, or a changing technological and legal environment.

Scott (2001) defines institutions as "multifaceted, durable, social structures, made up of symbolic elements, social activities, and material resources" (p. 49). Institutions are created because of "the development, recognition, and naming of a recurrent problem to which no existing institution provides a satisfactory repertoire of responses" (Scott, 2001, p. 96). In peer production institutions take the shape of formal regulations, informal social

norms, as well as shared actions and evaluations. Furthermore, institutions are encoded requirements and courses of activity embedded in software and hardware (de Laat, 2007; Markus, 2007; O'Mahony & Ferraro, 2007; Schroeder & Wagner, 2012). The institutional ecology of cooperation is established in order to protect the integrity of projects.

Most notably, the idea of freedom is enshrined in licenses such as the General Public License or the Creative Commons License (Lakhani & von Hippel, 2003; Lessig, 1999; Raymond, 1999; Stewart & Gosain, 2006; Vieira & de Filippi, 2014; see also Dulong de Rosnay, this volume). In projects such as the Linux kernel operating system, they guarantee some of the pivots of peer production and safeguard its essential modes of operation that rest on sharing, copying, adapting, and disseminating incremental contributions. This backbone is charged with a normative impetus, namely, that proprietary software "is antisocial, that it is unethical, that it is simply wrong," as Richard Stallman (2004) exclaimed. This again rests on the moral idea of a hacker culture where all information should be free and decentralization ought to be promoted so as to change life for the better (Levy, 1984).

Institutions are an ill-defined category. Following Scott (2001) we can distinguish "three pillars of institutions" (p. 51). They encompass regulations, norms, as well as conventional orders of knowledge and action (DiMaggio & Powell, 1991). Regulative rules come as provisions, statutes, laws or decrees that specify how an activity must be executed. They imply monitoring and enforcement through sanctions or gratifications that either penalize deviant behavior or reward compliance. In peer production projects, rules are vital resources to draw on in order to justify as well as to challenge a decision or action (Bryant, Forte, & Bruckman, 2005; Lakhani & Von Hippel, 2003; Pentzold, 2017, 2018; Viègas, Wattenberg, & Dave, 2004; Viègas, Wattenberg, & McKeon, 2007). Rules crystallize informal conventions or implicit standards in tangible written form and prompt what Giddens

(1984) has called an instrumental behavior. It can mean conformity, yet other responses such as prevention, defiance, or forms of gaming the system might also pose viable options.

The application of formal regulations can be backed up by normative demands. Norms can be seen, according to Scott (2001), as "conceptions of the preferred or the desirable, together with the construction of standards of which existing structures or behavior can be compared and assessed" (p. 54f.). They usually take shape in maxims, sayings, or moral doctrines like the dictum that "All information should be free," as documented by Levy (1984, p. 40) in his account of the hacker ethic. Because peer production projects only have a limited potential to enforce rules or prosecute wrongdoers due to their voluntary and open nature, they very much rely on informal norms (Raymond, 1999; Stewart & Gosain, 2006). Norms ideally do not need external sanctions because they encompass an obligatory moral request that takes effect by way of internalized commitment. In Max Weber's (1978) terms, norms feature the "prestige of being considered binding, or, as it may be expressed, of 'legitimacy'" (p. 31). Thus, while rules request an instrumental logic of individual interests and alternative ways to act, some of which are permitted while others are not, norms engender a logic of acceptability that is oriented towards an accordance of action and expectations (March & Olsen, 1989).

Both rules and norms rest on collective forms of knowledge and shared mindsets which endow them with sense and meaning. These cultural frameworks of wider belief systems as well as repetitive patterns of action often remain tacit. As such, they "not only constrain options: they establish the very criteria by which people discover their preferences" (DiMaggio and Powell (1991, p. 11). Similarly, Hall and Taylor (1996) suggested that "institutions influence behavior not simply by specifying what one should do but also by specifying what one can imagine oneself doing in a given context" (p. 948). This horizon of thought and agency cannot be reflected upon as a whole. The "way we do things" escapes

instrumental efforts to efface, add, or change particular elements as it unfurls in long-term processes of habitualization. This happens, as Berger and Luckmann (1966) stated, when an action is repeatedly performed. It becomes instituted as an expected pattern which is reproduced in further activity and as such then becomes the matter of codification, instruction, and reinforcement. The Code of Conduct adopted by the Debian project in 2014 demonstrates this dynamic. It sets down a number of basic principles. For instance, it includes the request to be respectful, cooperative, and concise.

As a social imaginary, suggests Charles Taylor (2002), basic normative understandings are "not a set of ideas; rather it is what enables, through making sense of, the practices of a society" (p. 91). Compliance does, therefore, occur because other kinds of thinking or acting are quite inconceivable (Scott, 2001; Zucker, 1977). Consequently, even when peer production projects do not feature a written code of conduct, accepted contributions will still follow an implicit cultural code. With a distinction made by John Searle (1997) we can say that work in peer production might, at times, not be guided by regulatory rules of commands and interdictions, but they are anchored by constitutive rules of sensemaking and evaluation.

The three institutional pillars can only be separated for analytical purposes. In practice, they are entangled: prescriptive rules go along with normative creeds which again only make sense against a background of taken-for-granted understandings. In peer production, institutions define what are considered to be correct forms of participation. They justify different positions among contributors and their stratified rights and obligations to execute decisions. They too establish authority among the stratified project participants and they account for their license to employ or manipulate technological levers.

It is important to note that the software and hardware of peer production enclose an institutional dimension *sui generis* (Lessig, 1999). As virtually all projects rest on a

technological infrastructure, design implications are essential instruments that configure the agency of contributors. The programs and algorithmic procedures set down in code are used in order to materialize regulations and social norms by way of organizing access to technical features as well as to the programming facilities themselves (Kesan & Shah, 2005).

Studying the institutional conditions in Wikipedia, Butler, Joyce, and Pike (2008) distinguished a set of perspectives among editors. One way of defining institutions was as rational efforts to achieve consistent and reliable decisions and to codify role positions and duties. From a different perspective, they were taken to represent evolving, competing entities which propagated themselves: rules generate more rules. Another view accentuated the construction of meaning and identity that defines the character and ambition of the project. Institutions were furthermore framed as external signals that indicated to audiences or users not actively participating that the project attends to problems, and finds ways to address them. They were also regarded as being internal signals that raise awareness for topics or perspectives and draw boundaries of a project's inside and outside. Wikipedia's set of rules, norms, and basic understandings was specified in terms of negotiated settlements and trophies that mark the end of conflict, or to signal binding consensus. Finally, institutions also served as control mechanisms set in place to ensure appropriate action.

Overall, institutions in peer production help to order the dispersed engagement of volunteers and to bring together meaningful, valuable outcomes. They should facilitate, not suppress productive engagement. In open projects with unsolicited membership and the constant exit option, we often find a plastic interpretation of institutions, not a strict enforcement though there are also institutionalized forms of sanctioning and ostracizing users. The flexible handling of rules and social norms pertains to the interests and agendas of the users involved. Hence, institutions in peer production are sites of conflict and specification and thus form part of editorial power plays (Kriplean et al., 2007). Besides, they

are a matter of socialization and instruction (Viègas et al., 2007). In this regard, Gabriella Coleman (2013) referred to an "ethical enculturation" (p. 124) she encountered among the contributors to the free and open source software project Debian. In order to stay relevant and mirror the requirements and concerns of the users, the institutions had to be actively practiced and passed on to incoming participants.

3. What Rules and Norms? Policies, Guidelines, and Basic Understandings in Peer Production

Institutions in peer production can be classified into those oriented towards products and those centering on work processes. Thus, they encompass, on the one hand, content standards about the form and quality of the generated and delivered goods and services. On the other, they include interactional standards and procedural standards that arrange the cooperation among project members. Reflecting the institutional register of regulations, norms, and basic understandings, peer production projects have formulated cognate distinctions with different degrees of authority, from axiomatic principles and enforced rules to advice or cues. They either prescribe, explain, or suggest correct forms of conduct and valid contributions to the project, respectively. In sum, they define a more or less strict scope of activity. This incorporates, along a decreasing level of exigency and validity, actionable rules, moral tenets, and non-binding musings.

Somewhat exemplary for a number of other peer production efforts, the English-language Wikipedia features three levels of policies, guidelines, and essays. The online encyclopedia rests on a core set of obligatory "five pillars" that originate from the beginnings of the project in 2001. One precept determines "What Wikipedia is not," and thus the content scope of the articles. A second specifies the so-called "Neutral Point of View." It demands authors represent all significant views fairly, proportionality, and without bias. The third

principle, “Wikipedia is free,” states the copyright status of the project that allows anyone to edit, use, modify, and distribute. “Civility” as the fourth axiom reminds the contributors to respect each other. This includes the policy to “Assume Good Faith,” which requires editors to treat and think of others well. Hence, this catalyst for cooperation works, Reagle (2010) explained, thanks to the “dovetailing of an open perspective on knowledge claims (epistemic) and other contributors (intersubjective)” (p. 161). To this end, the authors are framed as being cooperative, goodwill contributors striving towards productive joint work. In the English Wikipedia, the set of fundamental ideas is completed with the call: “Be bold.” That way, the authors hope to account for the evolving character of their trade. Participants should first of all aim to improve Wikipedia which might then also mean to scrutinize, adapt, or suspend existing policies and guidelines.

Although these five rules are marketed as being central and unchangeable, they nevertheless vary to some extent from one language version to another. For instance, in the German edition, the fifth maxim is missing. Further core institutions like the wikiquette, which has not yet congealed in a Wikipedia code of conduct like in Debian, attended to the conduct among users and therefore to the desirable manners and forms of social interaction. They required Wikipedians to be nice to each other, to be honest, and to abstain from legal threats. Other policies, guidelines, and essays dealt with, for example, the resolution of disputes, the organization of editing, and the handling of vandalism. They rest on regulatory practices that date back to the time of early Usenet applications and mailing lists (Baym, 1996; Sternberg, 2012).

In sum, they form the “Wikipedia policy environment” (Morgan & Zachry, 2010, p. 165), that has evolved in reaction to the editors’ need to handle emerging contingencies. The majority of policies tended to focus on process and legal issues whereas guidelines often dealt with content matters, and essays were mostly dedicated to user behavior. Like in other

peer production ventures, Wikipedia's "genre ecology" (Morgan & Zachry, 2010, p. 165) of policies, guidelines, and essays is mushrooming in character (Butler, Joyce, & Pike, 2008; Halfaker et al., 2013). In January 2008, Morgan and Zachry (2010) sampled 47 policies, 232 guidelines, and 404 essays. In his survey of March 2009, Reagle (2010a) found 686 pages in page categories relevant for organizing collaboration with 104 proper rule pages. Five years later, Jemielniak (2016) collected more than 1,200 regulatory documents in the English-language edition and counted 150,000 words in the 50 main policies.

The three groups of Wikipedia institutions provide no clear-cut and exclusive order but rather are a "helter-skelter hodgepodge" (Kostakis, 2010) with different levels of validation, integrity, irreversibility, and legitimacy. The extensive and somewhat haphazard corpus of provisions, conventions, and personal advice or opinions seeks to stipulate aspects of working on and in Wikipedia (Tkacz, 2016). Some purvey concrete descriptions of procedures and rationales for making decisions, others instead are composed of formulaic mottoes without tangible directives. They are complemented by a repository of software utilities created for aligning the content and patrolling contributions according to the standards in place. A vast number of robots or bots are, for example, maintained in order to handle menial tasks like fixing broken links or correcting typos. In Wikipedia's "sophisticated technomanagerial system" (Niederer & van Dijck, 2010, p. 1373), these tools, in combination with semi-autonomous editing interfaces, increasingly support the enforcement of rules, for instance, when they facilitate the detection and revertion of vandalism (Geiger & Ribes, 2010). In this way, technological assistants assume an increasing share of the contributions and also sustain the implementation of institutions. In July 2017, bots made about 20 per cent of all edits (Geiger, 2017). Referring to the technical protocols that steer the activity of bots, Müller-Birn, Dobusch, and Herbsleb (2013) spoke of an "algorithmic governance" (p. 80) sustaining peer production.

4. How to Create Rules and Norms? Institutional Work in Peer Production

There is no single way of establishing institutions in peer production. Given the participatory and emerging nature of its endeavors, users stress the idea that regulations and normative stances have to reflect established consensus and routines: practice reifies in policy. In effect, institutions should be linked back to changing consensus about the aims and scope of a project, conventional ways to contribute, or shifting values. Rules also ought to respond to urgent issues that require regulation. In this respect, a Wikipedia manual for example declared that "policies and guidelines are typically altered to reflect changing practice on the site or to solve a problem that has arisen" (Ayers, Matthews, & Yates, 2008, p. 369). Rules and social norms codify the status quo of practice and sensemaking in peer production and provide them with an obligatory force.

These purposive actions of creating and implementing institutions can be understood as a kind of "institutional work," that is, in the words of Lawrence, Suddaby, and Leca (2009), "practical actions through which institutions are created, maintained, and disrupted" (p. 1). In peer production, the construction of rules, the formulation of social norms, and the disposition of more widespread institutional understandings should be an ongoing, inclusive, and open-ended process. It runs through different stages from informal, local, and ad-hoc rulings to more long-term and holistic determinations (Kriplean et al., 2007). In ideal form, institutions are created in proposals which are the discussed and modulated until a consensus can be reached among the contributors. If commonly accepted, they become codified both in texts as well as in software which then direct their interpretation and enforcement. In this regard, institutions usually are "socially constructed, routine-reproduced," as Jepperson (1991, p. 149) held, despite instrumental schemes to install particular regulations or to exact

a ruling deemed official and binding. In principle, the formulation and adaptation of institutions is conceived of as an incremental bottom-up process.

Rules in peer production typically arise from many individual contributions. Their repute stems from the alleged broad inclusion of perspectives, the user acceptance of the process in which the institutions are configured and implemented, and the concrete provisions of what to do in terms of promoting productive cooperation and social interaction. In written form, they are shared and can be inspected and revised if need be. Yet rightly because the process and its outcomes are designed to be open and integrative, there is no linear development from heuristics to negotiated formal rules. Instead, the contributors uphold an enduring debate. The contentious struggles about the adequate form, scope, and application of institutions originates in the fluctuating user base with veterans leaving projects while new participants enter. These shifting populations, in connection with the fluid formation of the projects, propel continuous discussions around the organization of cooperation and the inspection of project products.

In order to compensate for this kind of friction, peer production collectives have proceduralized and decentralized the creation and enforcement of institutions (Beschastnikh, Kriplean, & McDonald, 2008; Jemielniak, 2016). For instance, in Wikipedia, Forte, Larco, and Bruckman (2009) discovered, on the one hand, a formalization of rule-making and, on the other, tendencies to decentralize their implementation. As the project matured, the formation of governance mechanisms was refined and assigned to institutionalized bodies. Hence, in the early Wikipedia conflicts among users were usually resolved according to fiat with the project founder Jimmy Wales acting as ultimate “benevolent dictator”. Over time, a special arbitration committee assumed many of these competencies. It follows a set course of evidence and deliberation in order to make decisions. These procedures were reproduced in separate projects and sub-projects of Wikipedia. Therefore, the effort to apply rules was

decentralized and spread across a broader set of contributors. Decentralization, therefore, helped to reflect community concerns and to involve a growing editor base in these tasks.

However, the increasing standardization of activities implies the decelerating creation of new policies whereas the interpretation of existing rules rests with senior members, rendering them less open to reversion (Kriplean et al., 2007; Morgan et al., 2012). "Calcification of policy is disproportionately felt by newer editors, who see their policy edits rejected at a higher rate," hence concluded Halfaker et al. (2013, p. 683). In the English-language version of Wikipedia, the growth of policies began to slow down in 2006 (Forte et al., 2009). In 2005, 217 new policies were proposed, 12 of which were accepted. In 2011, this number had dwindled to only 16 new proposals while the acceptance rate of 7.5 per cent remained stable (Halfaker et al., 2013). In contrast, institutional innovation has switched to essay format. These less restricted and binding documents responded to an increasing bureaucratization of the overall policy-making procedures and supported a kind of soft regulatory mechanism. So the number of essays had increased from 69 in 2005 to more than 185 in 2006 and in the following years (Morgan & Zachry, 2010).

5. Whither Rules and Norms? Governance, Hierarchies, and Bureaucracy in Peer Production

Rules, social norms, as well as basic understandings and values constitute an essential element in the governance of peer production. Governance can be understood, following Markus (2007), as "the means of achieving the direction, control, and coordination of wholly or partially autonomous individuals" (p. 152). In peer production, governance does not preclude autonomy, but presupposes free will and a non-contractual nature of cooperation. On this note, O'Mahony (2007) called it a "community-managed governance model" (p. 144). It manifests in the independence from commercial organizations, a pluralism of

interests and solutions, decentralized decision-making, and the prospect of autonomous choice.

For free and open source software, governance includes the free licensing of the software provided and usually of the technological infrastructure used for collaboration. It also encompasses the signaling and allocation of tasks to be completed, the inspection and selection of contributions, and the control of release versions (Markus, 2007). Besides written rules and normative creeds, governance rests on code features such as the concurrent versions system (CVS) used to keep track of changes to a file. The source code management system therefore helps to control software revisions. Developers also check the file transfer protocol (FTP) for the transmission of files between clients and servers on a computer network. Governance also covers the communication among project members in chats, via mailing lists, or forums. It deals, for instance, with bug reports, votes, or the communicative sanctioning of troublemakers like flaming, shunning, or kill-filing, that is, automatically discarding posts from particular users.

A core concern of peer production governance are hierarchies. Despite their egalitarian ambitions, structures of authority and influence have loomed in most projects (Dahlander & O'Mahony, 2011; de Laat, 2007; O'Neil, 2009; Weber, 2004). They frequently rest on seniority and thus on the length of continuous participation, as well as on the volume of engagement. Along these criteria, many ventures exhibit a loose onion-like segmentation into core contributors, regular or occasional contributors, and users or beta-testers (Raymond, 1999). Peer production relies on voluntary support and personal commitment so that "heavy-handed control can deter participation" (Shah, 2006, p. 108). In other words, leadership does not rest on formal command positions. Rather, authority is a matter of meritocratic achievement and acceptance (von Krogh, Spaeth, & Lakhani, 2003; Stewart, 2005). It presupposes a number of qualities such as communicative skills, the ability to recognize

valuable contributions as well as the competence to set goals, control tasks, and motivate fellow users.

The role model for this type of "benevolent dictator" (Weber, 2004, p. 89f.) is Linus Torvalds who founded Linux. In the project, he assumed a gatekeeper position from which he was able to monitor the release of official versions of the software. Being aware that his authority depended on the good-will and appreciation of participants, he "never orders anyone to do anything and even his suggestions are mild-mannered," as (Moon & Sproull, 2000). Such attitude and diligence are, however, precarious and nothing that can be taken for granted. Hence, Torvalds himself has been criticized for departing from this ideal by becoming more restrictive and imperious over time.

In their survey of governance styles in free and open source software, Shaikh and Henfridsson (2017) call this kind of governance autocratic clearing. "Autocratic clearing," they explicate with the example of the Linux kernel, "is a system of management with singular coordinating points that obliges other actors to channel all work and decisions through a central 'clearing house' before accomplishment." (p. 124). Other modes of ordering they examines involved a more stratified regime of decision-making and peer review of segments contributed to the Linux code. Next to such "oligarchic recursion" (p. 125) they found evidence for a more autonomous form of self-governance where branches broke away from the main project. Yet another type of governance process embodied the negotiation of mutually agreed decisions considering divergent viewpoints, what Shaikh & Henfridsson (2017) have named "meritocratic idea-testing" (p. 127).

The governance arrangements organizing cooperation in peer production and its outcomes are not fixed but evolve over a project's life-cycle. This change reflects the influx of new users and the growth of project. It also indicates transformations in the institutional environment of a project and in the relations between contributors (Mateos-García &

Steinmueller, 2008). For Debian, O'Mahony and Ferraro (2007) describe four phases of governance. Initially, the collective enterprise was organized by de facto governance. It was based on autocratic rule without any consistent involvement of the contributors. In the next phase of designing governance, a hierarchy of positions was devised that should exist apart from the actual people assuming a certain role. This plan was then set to work in the phase of implementing governance. It demanded that the execution of positional powers had to rest on the commission of fellow developers. The final stage of a stabilizing governance was achieved when elections were successfully held in order to transfer a mandate from one user to another (Schweik & Englisch, 2012).

Along these steps, Debian as a mature free and open source software project has established a 'Social Contract' that codifies key principles of cooperation and the normative expectations undergirding the users' collaboration. The responsibilities and the structural relationships of project governance are furthermore defined in a Debian Constitution and there are elections for project leadership. The many consecutive versions of this document show that it is not locked up but an element of ongoing debate and subject to amendments (Sadowski et al., 2008).

In Wikipedia, what has been devised as a fluid and transparent process risks petrifying into quite rigid bureaucratic configurations with counter-productive consequences. Instead of facilitating cooperation, standardization and hierarchization block new users and hinder user retention. They complicate decision-making procedures, promote elitism, and lead to an organizational deadlock that defies the ideas of openness and inclusivity. These implications of bureaucratization as more of a burden than a driver of peer production have especially been studied for Wikipedia (Butler et al., 2008; Carr, 2011; Halfaker et al., 2013). Despite early accounts of an ad-hoc form of non-hierarchical governance (Konienczny, 2009, 2010), in many language versions hierarchies have tended to become more pronounced

(Shaw & Hill, 2014). In line with this finding, the number of links to policy pages in Wikipedia discussions has increased, in particular in reference to the rules about signing individual posts, the use of reliable published sources, and the neutral point of view (Beschastnikh et al., 2008). While the citation of policies has risen, their creation slowed down (Forte & Bruckman, 2008). The attention towards existing rules thus went hand-in-hand with the diminishing flexibility to change these rules and declining revision activity (Keegan & Fieseler, 2017).

6. Conclusion

The organization and governance of peer production projects has to balance the independence of individual contributors and the interdependence of a collective endeavor. In-between the promise of autonomy and the implementation of due process, peer production projects struggle with the suitable level of provision and tolerance (Kostakis, 2010). Initiatives have fed on principles of free choice and increasing individual agency. Yet they are challenged by the reality of an increasingly vast and pervasive texture of rules and requirements which should secure the accuracy and value of the resource and respond to societal expectations.

In this ongoing transformation, standards in Wikipedia have, for instance, changed from "folksy 'description of how we do things'" to "punitive 'the way one must do things because otherwise they will punish me'," Lih (2009, p. 224) claimed. Being aware of these tendencies of increasing formalization, the editors of the online encyclopedia have also devised the somewhat paradoxical rule to "Ignore all rules." It states that if a rule hinders users from improving Wikipedia it should be willfully ignored. The call to be bold and edit thus seeks to balance mushrooming specifications with the vital commitment to openness. Interestingly, this principle is not found in all Wikipedia language versions, which points to

the heterogeneity of the arrangements prevalent among the myriad endeavors that make up peer production. There are forms of isomorphism where different projects follow connate social norms and rules as well as distinct institutional settings peculiar for an individual enterprise.

A blueprint for the future design and implementation of peer governance is arguably provided by Elinor Ostrom's (1990) principles of successful common-property regimes. They are a key reference for analyzing the provision and allocation of shared resources in "settings in which the individuals involved have exercised considerable control over institutional arrangements" (p. 61). Sustainable, long-term settings rest on the congruence between institutions and local conditions. They are marked by collective choice arrangements where people affected by rulings should also participate in their formulation and enforcement. This kind of reciprocal responsibility also ought to foster the monitoring and conflict resolution mechanisms. Graduated sanctions allow community members to adapt penalties in accord with the severity of wrongdoings. Ostrom furthermore points to the need for local enforcement where communal jurisdiction is recognized by external authorities, and she underscores the importance of multiple layers of organization and governance. In effect, commons-based projects form a type of nested enterprises where productive participation is arranged at different levels that reach from small circles to the entire community.

With these directions for successful mutual and inclusive governance beyond markets or firms, Ostrom's work on property-rights regimes seems to be a natural fit. Indeed, many peer production projects have sought to emulate some of the advice (Aaltonen & Lanzara, 2015; Forte & Bruckman, 2008; Keegan & Fiesler, 2017; Kiesler et al., 2011; Pentzold, 2011; Viègas et al., 2007). Yet while Ostrom deals with the allocation and provision of scarce natural resources, peer production mostly centers on information goods whose use is

nonrival (Hess & Ostrom, 2006). In consequence, urgent issues revolve around the creation of common resources, not their consumption. This is unfinished business. In order to expand and reinforce the collective capability of contributors, peer production's institutions have to be continuously aligned with the dynamically unfolding conditions and requirements of its projects.

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