

## **Participation in Online Creation Communities: Ecosystemic Participation?**

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### Abstract

The tendency to strong inequality regarding the distribution of content contribution is characteristic of most online creation communities. In order to explain the results of participation distribution, an analysis of the main organizational characteristics and logics of participation in online creation communities is presented, and a conception of ecosystemic participation explored. The empirical analysis is based on a statistical analysis of 50 cases and a comparison of two cases studies: Wikipedia and opensf.net.

Keywords: Online creation communities, participation inequality, ecosystemic participation

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## Participation in Online Creation Communities

Conventional participation in most industrial countries has decreased in recent decades (Blais, 2000). Furthermore, citizens' discontent with the mechanisms and institutions of representative democracy has increased (Pharr & Putnam, 2000; Dalton & Wattenberg, 2000). From the perspective of the evolution of democracy, it could be argued that the representative democratic system is in a period of turbulence and readjustment. Some authors also argue that the crisis of conventional forms of participation creates resources for new forms of participation (Norris, 2002). In this line of thinking, the crisis of participation in conventional politics has been accompanied by the increase of non-conventional forms of participation and public expression (Norris, 2002; Cain, Dalton & Scarrow, 2003; Stolle, Hooghe & Micheletti, 2005). An area of particular interest is how the Internet and the new technologies of information and communication (NTI) in general are related to the increase of non-conventional forms of participation. Previous research on the Internet and politics debate has mostly concentrated on well-established and traditional actors and with mainly offline bases (Trechsel, Kies, Mendez, & Schmitter, 2003; Norris, 2002; Römmele, 2003; van den Donk, Loader, Nixon, & Rucht, 2004; Vedel, 2003). The analysis presented in this paper instead concerns online creation communities.

*Online creation communities* (OCCs) are a specific type of online community. OCCs are a form of collective action performed by individuals that communicate, interact, and cooperate in several forms and degrees of participation which are integrated in an eco-system. This communication, interaction, and cooperation is mainly via an Internet-based platform for participation and with the common goal of knowledge-making and sharing. OCCs result in a *digital common*, that is, an integrated resource of information and knowledge (partly or totally) collectively owned and freely accessible to third parties.

Knowledge-making in the frame of this research is defined as the process of the creation and systematization of socially dispersed information and knowledge resources and cognitive capabilities resulting in evolving bodies of shared knowledge.

Other terms used to refer to these types of online communities are mass collaboration, common-base peer production, and/or social production (Leadbeater, 2008; Benkler, 2006).

The OCCs emerge in diverse fields, including scientific communities (i.e., multi-media content, scientific resources, political organizing, or linguistic communities).

OCCs are an interesting form of collective action from two points of view. First, OCCs are interesting from the point of view of constituting spaces for civic engagement, the dissemination of alternative information, and participation in the public space, which could contribute to enriching public discussion in a representative democracy. Second, OCCs are interesting from the point of view of citizen engagement in the provision of public goods and services based on a *commons* approach, that is the provision of public goods not necessarily linked to the state or other conventional political institutions.

## **Empirical Research Design**

The combination of several approaches and perspectives characterizes the empirical research design. Both offline and online methods are used; and a quantitative large-N analysis and a qualitatively-oriented comparison of two cases studies contribute to the triangulation of methods.

The large-N Web analysis was based on a sample of 50 units and was analyzed by elaborating a codebook, collecting data of digital threads, and producing a descriptive statistical analysis of the data.

For the sampling, a snowball method was used. The strategy for the selection of the units for the sample was based on covering a variety of OCCs following several sampling guidelines: those with international scope; a balance between larger and smaller OCCs; equilibrium between more recent and older organizations; and a balance between the several types of knowledge content.

After the sample was built, I designed a codebook for the large-N (available on request) analysis. The codebook aimed at conducting a structured analysis. The codebook consisted of a set of options concerning the presence or otherwise of indicators. I followed the codebook for each case, visiting and observing the Web site of each OCC. During the "field notes" stage the general impression was also kept. The data was collected in May 2008 and in January 2010. The large-N analysis helped to define the analysis for the case studies and their selection.

The in-depth case studies focused on Wikipedia and [openesf.net](http://openesf.net). Starting in 2001, Wikipedia is one of the great successes of collective action on the Web. It is an online encyclopedia built through the collaboration of volunteers on the web. It contains millions of articles and ranks among the top ten most visited sites. It is based on wiki technology, every one of its articles can be edited by anyone – credentials are not checked. Changes are visible to everyone immediately, without any review cycle. The platform that hosts Wikipedia is provided by the Wikimedia Foundation.

The other case study is [openesf.net](http://openesf.net). [Openesf.net](http://openesf.net) is a platform provided by the European Social Forum (ESF). The ESF is the main gathering of social movements in Europe. It is the European section of the World Social Forum, which started in 2001 as a meeting of alternatives and to critique the neoliberal approach of the World Economic Forum of Davos. Both Social Forums host platforms for archiving information on the forums, developing the forum program, facilitating the network among the forum participants, and allowing the collective (re)construction of the memory of the forums. It covers issues such as the alternative economy, neoliberal criticism, and environmentalism, among other issues.

One of the positive aspects of this case selection is the independence of the cases. These cases have multiple causes, diverse roots, and varied trajectories. However, similar organizational principles are involved regardless of the substantive contexts.

I combined several methods in carrying out these case studies. Furthermore, I did not follow the same plan for each case. Before starting this work, I had already researched the Social Forum case study, but not alongside Wikipedia. In this regard, I carried out fewer interviews for the Social Forum case because I was already familiar with it. Furthermore, for the Social Forum case, I developed statistical analysis of participation data for Openesf.net, since such data were not already available, while for the Wikipedia case, I did not analyze data on participation because there was already information available from previous empirical research.

Data on the social forums was collected and developed during 2007 and 2008. The Wikimedia data collection took place between July 2008 and August 2009.

The data for the opensf.net case study was collected using online ethnography; participant observation at meetings of ESF organizers; 25 interviews of main ESF organizers, opensf.net providers and participants, assuring a plurality of nationalities and backgrounds; and most importantly the statistical analysis of participation data available about the Web site.<sup>1</sup>

The data collection for the statistical analysis of participation in opensf.net was extracted through online ethnography on 4, 5, 6, and 7 March 2008. The data was extracted for the complete population (220 participants and 62 projects). Field notes were also made during the data collection. (The codebook on participation data can be provided on request).

It is worth mentioning that Openesf.net closed in March 2010 due to a lack of resources of the ESF.

The Wikipedia case study evidence was gathered through online ethnography; participant observation at meetings of Wikipedians, the annual meeting of Wikipedians (Wikimania), and at the Wikimedia Foundation headquarters; and 35 interviews with Wikipedians of several nationalities and backgrounds. For the Wikipedia case I did not analyze data on participation, using instead the available data from previous research. More concretely, I used the data available from the wiki analytics developed by the Wikimedia Foundation and available at the Web site, and the research conducted on the ten bigger linguistic Wikipedia by Ortega & Gonzalez-Barahona (2009).<sup>2</sup>

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<sup>1</sup> Online ethnographies were conducted for the mailing list and online spaces at the opensf.net Web team 2008, Openesf team 2008, fse-esf mailing list, Nordic ESF Documentation and Nordic Web group; for the Web sites fse-esf.org, opensf.net, openelibrary.info and esf2008.org; and for weekly chat meetings of the ESF Web team. Interviews were carried out during the European Preparatory Meetings. Participant observation was carried out at the *European preparatory Assemblies* and ESF Web team meetings at Lisbon April 2007; Stockholm September 2007; Istanbul December 2007; Berlin February 2008; and, Kiev June 2008.

<sup>2</sup> Online ethnography of English, Italian and Spanish Wikipedia and of the mailing list foundation\_1, Wiki-research-1 and Wikipedia\_1. Participant observation at Wikimedia Italia annual meeting: Rome, September 2007; Meet up Palo Alto November 2008; Wiki meet up Boston October 2009; Ten Days volunteering at Wikimedia Foundation (From 10 to 20 December 2008); Wikimania. Buenos Aires August 2009; and Wikimedia Italia annual meeting at Rome in September 2009.

## Distribution of Participation in Content Generation in OCCs

Highly cooperative OCCs are emerging around online media (i.e. Wikis, e-lists, Internet forums). The question is: how is participation organized in such forms of collective action?

Research on the distribution of participation in online communities suggests some common features of the distribution of participation in content generation in online communities. A very low percentage of committed participants usually account for a disproportionately large amount of the content; a low percentage of participants that make very small or indirect contributions; and, finally, a large presence of individuals that do not participate. This distribution of participation is known as 90/9/1 principle or 1% power law (Hill, Hollan, Wroblewski, & McCandless, 1992; Horowitz, 2006; McConnell & Huba, 2006; Nielsen, 1997;). It refers to the general observation that 90% of visitors are lurkers who read or observe but never contribute, 9% who contribute a little or from time to time, and 1% of participants who contribute a lot and account for almost all the content and system activity (Nielsen, 2006).

Lurker is a term that refers to a person who reads discussions and observes an interactive system, but rarely, if ever, posts or participates. However, many lurkers feel that they are part of the community (Nonnecke & Preece, 2000).

Even before the Web was invented researchers documented participation inequality in a variety of online media (Hill, Hollan, Wroblewski & McCandless, 1992; Nielsen, 1997; Whittaker, Terveen, Hill & Cherny, 1998). In a study of more than 2 million messages on Usenet, Whittaker, Terveen, Hill & Cherny found that the most active 3% of posters contributed 25% of the messages, while 27% were from people who posted only a single message (1998). The presence of lurkers was also documented by initial online communities such as the Well (Rheingold, 1993; Turner, 2006). In Free and Open Source projects (FLOSS), a small amount of very active participants are responsible for the vast majority of the work (Ghosh & Prakash 2000; Koch & Schneider, 2002; Mockus, Fielding & Herbsleb, 2002). This behavior in FLOSS is not only specific to source code production, but can generally be found in other elements in software, such as documentation and translation tasks (Robles, Gonzalez-Barahona & Merelo, 2006).

Previous analyses of Wikipedia have addressed the question of participation distribution and showed that contributions to Wikipedia also present strong inequalities. Depending on the research, the importance of a “core team” as the main contributor of most of the content is more or less balanced with the contributions of a long line of less frequent participants. Jimmy Wales, the founder of Wikipedia, originally noted in December 2005 that “half the edits by logged in users belong to just 2.5% of logged in users.” (Wales, 2005). Research since 2005, particularly by Kittur, Chi, Pendleton, Suh, & Mytkowic, measuring contribution differently by different classes of editors, showed that elite contributions (10,000 or more edits) were less powerful in comparison with the “long tail” of small participants. The authors put it in this way: “Power of the Few Vs. Wisdom of the Crowd: Wikipedia and the Rise of the Bourgeoisie” (2005). However, Ortega & Gonzalez-Barahona later concluded that less than 10% of the total number of authors are responsible for more than the 90% of the total number of contributions or, in the opposite terms, 90% of the active editors are responsible

for less than 10% of the total number of contributions. Ortega & Gonzalez-Barahona's results reduced the importance of the "long tail" and instead reinforced the idea that contributions by the most active participants overwhelm contributions by the crowd of sporadic authors. According to these authors, the evolution of this inequality over time remains very stable (with a typical value of between 80% and 85% of content produced by a core team). Furthermore, all the top-ten languages of Wikipedia showed a similar pattern. A very variable behavior pattern at the very beginning of each Wikipedia (up to 20 months) then altering and showing a common growing trend of inequality, characteristic of mature Wikipedia environments in every language. Finally, these authors also pointed out that the "core team" of very active participants is not necessarily formed by the same individuals over time (2009).

Concerning the *openesf.net* case, previous research on the social forum has not paid attention to the distribution of participation in the online platforms linked to them. To fill this gap, I analyzed the actual participation at the *openesf.net*, an online community hosted by the European Social Forum.

Participation at the ESF is organized around both organizations and individuals. However, I analyzed participation in *openesf.net* in terms of individual participation, since the large majority of the accounts (97,19%) are registered with the name of an individual rather than an organization.

Concerning participation by generating content, the results of the analysis showed that 18 % of the participants generated content and 82 % of the participants did not. Among the participants that did generate content the more frequent contributors are those that generated content for *only* one project (14,2%) while the rest generated content for two to seven projects (3,7%).

The results show that 18% of participants generated content and 82% did not. Within the 18% of content generators, 3,7% were very active participants (generated content in more than one project) and 14,3 % were less active participants. In this regard *openesf.net* follows an 82/14,3/3,7 rule. Several reasons could underlie the higher percentages at *openesf.net* as opposed to 90/9/1. On the one hand, *openesf.net* is not completely open, it requires registration which already indicates a higher commitment to participation. If we consider participation in terms of only visiting the site (without registering) the percentage of active participation would be lower, as the number of participants with lower commitment would increase in contrast to those with higher commitment. On the other hand, participants in *openesf.net* also meet in organizational meetings and during the ESF itself. The fact that *openesf.net* participants have other ways of knowing and meeting each other could affect the way people act on the site, for example, it could be the case that it increases participation as some of the participants already know each other.

Furthermore, the results depend on how content is conceived. The generation of content was strictly defined as activities which are not directly related to personal information. Content was understood as the creation of spaces for a project, the editing of wiki pages in the projects and the upload of documents or other audio-visual material in the projects. Instead, if we look at participation in terms of "exhibitionism", that is considering if the participant

provides not compulsory information about him/her at the participant page, then the results change. 44,9% of participants provided at least one extra item of information about her/himself in the registration process. In this regard, if we consider providing personal data as content generation, 44,9 % of users would be considered participants. According to Bimber, Flanagan & Stohl one primary effect of NTIs is to make boundaries between private and public domains porous and easily crossed (2005). In this regard, the decision to consider the provision of personal data as content or not must be taken carefully, as it would change the results on the distribution of participation in content generation.

In sum, the tendency to inequality seems to be characteristic of most online communities. However, actual percentages per each profile (active participants/participants/lukers) may not follow the 90/9/1 principle to the letter. Percentages for each profile may depend on what the content is and the protocols for participation in each community. For example, for some communities the percentage of active participants is a bit higher, as will be shown in the following section for the Openesf community case, while in other cases, such as YouTube, only 0.16% of visitors upload content (Source: 90-9-1.com). From this analysis it also emerges that depending on how active content contribution is conceived, results may vary substantially. In order to develop rigorous comparisons of participation at OCCs shared indicators of participation in content generation must be established - which is difficult due to the diversity of content addressed by OCCs.

### **Organizational Logic of Participation in OCCs**

In the previous section, I addressed the distribution of content generation among the participants according to quantitative data on participation. In this section a qualitatively-oriented analysis will be presented instead, in order to approach the organizational logic and main organizational principles of the OCCs' environment. Environment refers to the architecture or structure of the space combined with the social norms and values that regulate it. Additionally, how the several organizational principles relate to each other will form part of the analysis. Finally, reflections on how these organizational principles affect types of participation, and, more concretely, result in the 90/9/1 principle, will also be presented.

My analysis departs from the assumption that collective actions following a representational ethos and collective actions following a participative ethos have their own distinctive logics and dynamics. The meaning and function of participation in a representative organization could be different from participation in an open-to-participation organization. Furthermore, online environments have some constraints that could affect the way participation takes place.

### **Main organizational principles of participation in OCCs**

#### *a) Openness to participation*

Openness to participation is the main principle in OCCs. Concrete indicators of the openness to participation dimension are the provision of multi-interactivity channels of participation

that allow participation in the content hosted at the site, and the protocols that guide those applications. Protocols refer, for example, to low requirements for credentials to participate. According to Reagle, this open character has a non-discriminatory meaning, and "prohibits arbitrary discrimination against persons, groups, or characteristics not relevant to the community's scope of activity" (2004).

According to the large-N analysis, OCCs usually have an average of 4 different channels of participation (i.e. the possibility to add comments to a specific section of the contents, upload materials, and edit Web pages, among others). The protocols that guide participation in OCCs appear to incentivise participation in a high percentage of the cases (i.e. 80% of the registration systems allow automatic registration without requiring any filter to become part of the platform).

By highlighting the importance of the openness to participation principle in OCCs, I am not implying that all OCCs are equally accessible. OCCs constitute a substantial reduction of the barriers to information and knowledge. However, the level of inclusion of OCCs and the reduction of sources of barriers to participation is not absolute and depends on the issue dealt with. In terms of information usability, the analysis shows that this is an important aspect of the OCCs (all the cases have at least one indicator of usability). However, in other aspects linked to inclusion OCCs perform badly. For example, OCCs turned out not to be inclusive in terms of accessibility for people with physical disabilities. In terms of inclusion by reducing the barriers to use and access the technology which supports the collective action, the OCCs are again irregular. Some OCCs have mechanisms to reduce the barriers linked to the technical base, however 16% of the cases have none.

Although the OCCs are characterized by the importance of openness to participation, the participant observation data showed that equal participation and contributions did not seem to be expected.

While according to the representative ethos, equal participation (understood as equal representations of all voices) constitutes one of the pillars of legitimacy in representative systems, in OCCs, equality seems to refer to the openness for participation (as a possibility) rather than in the resulting participation and contribution.

Finally, it is worth mentioning that openness to participation has a trade off. It does result in disruptive behavior, such as spam or vandalism.

Concerning the case studies, in both of these the indicators for the importance of openness as defined for the large-N analysis are present: that is, both cases adopted easy to use technology and channels for open participation, plus a lack of requirements for credentials or other requirements in order to intervene. However, in contrast to Wikipedia, where a person can intervene in the content without being registered, in Openesf the user must register in order to intervene. Registration is however automatic, and so it is not a very high barrier to openness to participation. Furthermore, Openesf.net had different degrees of openness. Openesf.net is divided into projects and each project can decide the level of openness for intervening in the project, choosing between: open to any person registered at Openesf.net or open only to members of each specific group at Openesf.net.



Finally, in the discourses of both cases it is emphasized that the community provides the accessibility to participation. For example, when Wikipedia is presented as "*the encyclopedia that anyone can edit*" (Source: Wikipedia main entrance).

The emphasis on the openness to participation principle impressed in the environment does not necessarily result in actual participation, that is it does not necessarily mean that the OCCs see high participation. If an OCC is participated in or not is a difficult, but overall a relative question. The maximum level of participation depends on the actual goal and target constituency of each case. As will be presented in the following, the openness to participation principle is at the service of the goal or mission of each OCC.

In terms of resulting participation in the case studies, it may be said that Wikipedia achieved a high level of participation in accordance with its goal. As mentioned previously, empirical research showed that 10% of the participants generate 90% of the content (Ortega & Gonzalez-Barahona, 2009). Considering that 10% of the very active participants in Wikipedia number more than 300.000, it can be concluded that Wikipedia is highly participated in (Source, Wikimedia Foundation). More than 300,000 participants is a high level of participation if we compare with other forms of organizing for the achievement of a similar goal, such as the Encyclopedia Britannica (Emigh & Herring, 2005).

Furthermore, the Wikipedia community accomplishes its goal. Wikipedia is the largest encyclopedia in history. There does not seem to be a problem with a lack of participation in Wikipedia. On the contrary, on some occasions a problem of "too much participation" occurs. This happens when the levels of participation are so high that technically the system is not able to sustain the amount of activity and collapses. This occurred for example after the 11 September 2001 attacks or the Obama elections, during which many people wanted to keep Wikipedia updated (Interview Tomasz Finc, Wikimedia Software Developer, San Francisco, November 2009).

Interestingly, from my participant observation, I noticed some signs that suggest that inequality in terms of contributions does not seem to be interpreted as a problem among the Wikipedia participants. GerardM, an active wikipedian, spoke out in an mailing list against the idea of regular equal contributor and for valuing all community forms: "*When you divide people up in groups, when you single out the ones "most valuable" (because they contribute more), you in effect divide the community. (...). When you label groups of people, you divide them and it is exactly the egalitarian aspect (independently of their contribution) that makes the community thrive*" (GerardM e-mail to the mailing list Wiki-research-1 21 October 2008). However, this hypothesis on how Wikipedia interprets the inequality of participation would require further research to be fully analyzed.

Concerning the resulting participation in *openesf.net*, the picture is less clear. *Openesf.net* is the first tool based on the open participation principle to actually raise significant participation in the Social Forums. However, the levels of participation at *openesf.net* are low (less than 1200 registered at the highest point) in contrast with the number of participants in the ESF (between 20,000 and 60,000 people registered at the ESF, depending on the year) (Source, main page of the European Social Forum).

Furthermore, in terms of the interpretation of the inequality of participation in opensf.net, there is a discrepancy among ESF participants. In some of the interviews with ESF participants some resistance to the adoption of open platforms was expressed, because they could increase sources of inequality in participation, while others do not mention this reason or do not consider inequality a problem in itself. So again, more systematic research on this specific question would be required in order to investigate the interpretation of inequality of participation in opensf.net and in OCCs more generally.

*b) Participation is possible in multiple forms and to different degrees*

Participation is possible in multiple forms and to different degrees. Multiple forms refers to task distribution. Not all participants necessarily fulfill the same tasks, but can choose among several (i.e. adding new content, editing content, classifying content, among others). One person could contribute with non-edited information while another participant takes care of editing it and increasing its quality. Some tasks may require more effort and commitment than others, however, tasks in most of the cases are highly divided, so that each participant can develop just a small part of a module, or a large part of it, facilitating the scaling of the participation.

This must not be confounded with a lack of structure, on the contrary the system is highly structured. The environment is split into modules, which makes it easy to locate information without knowing what occurs on the overall site. Search engines and meta-data systems, which are present in 98% of the cases, allow all the modules to be put together, making them easier to handle.

It may also be worth mentioning another type of participation present, "bots", that is a program developed and controlled by specific participants to execute specific and repeatable acts (such as automatic corrections) which are on some occasions responsible for a large amount of activity.

That participation is possible to different degrees refers to different levels of commitment to the site in terms of time and active task performance. The environment's design allows different availabilities for contributions to be accommodated, which, furthermore, results in the three main profiles of participation: very active or strong, weak and non-participant. Several empirical studies have shown how a mixture of strong and weak ties are crucial for organizational success in social movement organizing (Campbell 2005, p.64; Mansbridge 1986; Morris, 2000, p. 450; Uzzi, 1996).

Very active and committed participants are present. That is, people who have a large degree of commitment to the process and dedicate a great deal of time and a large volume of work or complex effort to it.

The formation of a "critical mass" of active participants is particularly important for starting an online community. In Howard Rheingold's (a proponent of the virtual community) words: *"An online community either gets started or it doesn't. The first important stage is growth, at the very beginning. If you do not have a critical mass of participation – that could be ten*

*people! (then the online community doesn't get started). But then you're going to have to scale that so that it's not overwhelming for people.*" (Interview Howard Rheingold, Palo Alto, December 2009).

Sporadic or low level participants are also present. The modular organization and task distribution makes it easy to make only small or weak contributions.

The weak ties enable OCCs to reach populations and audiences that are not accessible via strong ties. That is, people who can contribute only sporadically, but not with high levels of commitment.

At FLOSS, the low level of active commitment required among participants is seen as an advantage (Freeman & Rogers, 2002). Granovetter suggests the importance of weak ties for collective action. Weak ties favor reaching vast and diverse fields of information resources (Granovetter, 2005). The concept of *weak cooperation*, as proposed by Cardon and Aguiton (2007), refers to this characteristic of the relational model of online-based collective action. According to these authors, online cooperation around a common goal generally creates weak links (but a large network) in comparison with offline collective action (Cardon & Aguiton, 2007).

In sum, both strong and weak participation are present and accommodated in OCCs. Weak and strong participation constitute important contributions to the community. Furthermore, non-participation or unintended participation is also present and plays a role.

Non-participation could be characterized as free riding behavior. However, free riding, and in general the fact that a large percentage of people do not contribute, do not necessarily constitute a problem for the achievement of the common goal of OCCs. Free riding constitutes an impediment depending on the good the community aims to build. With exhaustible goods, such as natural resources, which can be "used up" and are costly to extract, free riding constitutes a problem. But in a context where new information and communication technologies have substantially decreased the cost of the reproduction of information, goods-based information, like that provided by OCCs, do not necessarily face scarcity problems. When goods are non-exhaustible, non-competitive and exclusion from their use is costly, then free riding is not necessarily a problem. It is even said that OCCs are anti-rival (Weber, 2006). They are not *only* non-rival in the sense that they can tolerate free riding without reducing their stock of value, but are actually anti-rival in the sense that as a whole OCCS positively benefit from free riders. That is, ironically, the value of the outcome of the OCCs increases when more people use them (Benkler, 2006; Bollier, 2008). This implies that for any participant, whether contributor or "free rider", the mere "use" implies a contribution. Nevertheless, this is only so where there is a sufficient number of contributors.

There are several mechanisms by which the value of a digital commons resulting from OCCs increases as more people "use" it.

Firstly, non-participants contribute due to network effects. When network effects are present, as more people "use" the same product or service the more valuable it is.

Secondly, in online environments most of the actions are translated into digital information,

known as *digital threads*, the elaboration of the digital threads are a source of very valuable information to improve the content and environment functioning. It could provide relational and attention data. For example, the environment can learn about the connections between content according to how users navigate across them. Or the number of times an article was visited or downloaded could be used as an indicator of quality.

Thirdly, the non-active participants also play a role as *audience*. *Free-rider audiences* increase the relevance and value of the site's content and increase the motivations for participation.

Finally, it is also worth considering that even though exclusion is present in OCCs, restricting access to non-participants could be costly.

Concerning the case studies, both Wikipedia and opensf.net are based on a modular and high task distribution architecture. Plus, as presented in the previous section, both at opensf.net and Wikipedia the distinction of strong/weak/non-participants is present.

### *c) Modularity and decentralized participation*

The modular organization of the environment with the splitting of content into separate units (such as articles, software packages, albums of thematic pictures etc.) not only facilitates the presence of several degrees of participation, but also regulates the decentralization of activity, which facilitates the scaling of participation.

Not all participants are involved in all the projects or modules, instead, particularly as the OCCs grow, there is a recurrent tendency for participation to split or fragment into projects or modules.

Empirical research has been carried out on the relationship between centralization and project size in FLOSS. According to Crowston & Howison, centralization scores are negatively correlated with the number of active participants. "In a large project, it is simply not possible for a single individual to be involved in fixing every bug (errors). As projects grow, they have to become more modular, with different people responsible for different modules. In other words, a large project might be an aggregate of smaller projects, resulting in what might be described as a 'shallot-shaped' structure, with layers around multiple centres" (2004, p. 15). In Lanzara & Morner terms: "a characteristic feature of development communities is that the process oddly combines a slow global convergence (among all the participants) on the one hand and short and fast local activity cycles" between a small number of participants on the other (2004, p. 20).

Additionally, distributing the environment between modules favors the scaling of participation. The participation of many people in a single (central) place is more difficult to handle.

The division into projects and the resulting decentralization of the participation is present in both the Wikipedia and the opensf.net cases.

Concerning the Wikipedia case, only very rarely are there occasions which co-involve the entire Wikipedia community. Most of the activities of Wikimedia projects are based on the interaction of small groups. Interviewees even mention a profile of participants “that just write articles in his corner” (Interview Jon Davis, Wikipedian, Berkeley, November 2009).

Concerning the *openesf.net* case, any participant can be part of all the projects. In fact, 41,5% of the projects are composed by one only member, the rest are composed of 2 to 27 members. The projects with 3 members are the most frequent (20,8%).

The decentralized character of the participation is a significant characteristic of the OCCs. It is significant in its contrasts with, for example, social movement organizing, such the cases of the Social Forums process or the *Euromayday* (mobilization process around labor precarity in Europe). In traditional social movement organizing, collective action or "doing something together" is conceived of as experiencing moments and places together, such as a decision-making assembly which gathers all the participants. In the case of OCCs, collective action is not a moment or place of "unification", but instead a form of being together in a fragmented or decentralized way.

The decentralized and fragmented character of OCCs opens up the question of what links them. Importantly, collective action is driven by a common mission (as we will see below). However, it is worth mentioning that in terms of the aggregation of the common, decentralized form of the OCCs, also have "trade-offs". After observing OCCs I began to suspect that the aggregation of the "collective will" (beyond the common mission) become more problematic in this form. Moments which require a collective "voice" in OCCs and which are difficult to achieve with a community form are, for example, decisions on important changes in the site architecture or requirements which arrive from the external world (such as legal questions). However, more research would need to be carried out to confirm these impressions.

Additionally, in terms of what links the whole modules, they share the space (the platform) and norms. Furthermore, the use of the same protocols or language links or connects the fragmented or decentralized pieces. In my view, this constitutes lateral forms of aggregations, (more than hierarchical forms or a unification by centralization form) which are essential to the OCCs' organizational logic.

#### *d) Participation is asynchronous*

As presented in the previous section, participation is decentralized and there are few tasks in which all participants are involved, it is very rare that all participants are expected to congregate at the same time.

Members are typically geographically dispersed and the platform is their means of interaction (Kollock, 1999). Furthermore, in OCCs of international scope, the time zones of the participants can be very different, which makes it difficult to meet at the same time.

A moment in which participants congregate at the same time is during physical encounters.

Interestingly, some interviewees said that as more online interaction takes place, there is more need to meet physically.

Asynchronous participation is present in all the cases studies. In the two cases, there are organized "local" meetings among the participants. Plus, both of the case study OCCs hold an annual meeting. For the case of Openesf the annual meeting is much bigger than the online community; while for Wikipedia the opposite is true. Wikimania, the annual meeting of Wikipedia, gathers a small fraction of the community, and from my participant observation, I noticed that those who attended tend to be the more strongly committed. In the case of the ESF, there is also organized synchronized communication through chats.

*e) Participation is mission-oriented and methodologically plural*

The online frame and the communication possibilities available define the possible organization of the OCCs, and explain some of the organizational choices present, but the issue for analysis in the sector is that the agenda of each OCC also shapes the organizational choices.

Collective action is understood as the pursuit of a goal or set of goals by more than one person. The goal or mission of an OCC is very specific and limited, to build a specific information pool.

I observed that the level of attachment to the mission among each of the different forms and degrees of participation present in the OCCs could be different. That is, there are participants who seem strongly committed, while others do not seem to consider the common mission when they intervene. In this regard, as there are different degrees of participation, there are different degrees in the identification of each individual with the overall mission and goal. Some participants do strongly identify and build an identity as part of the OCC. However, participants do not need to identify with the project as a whole in order to participate. Along the same lines, Stalder argues that the majority of the participants have an individualistic approach to the platform and very few participants have a holistic interest in caring about the dynamic of the whole platform (Transcripts discussion on web communities, Networked Politics Seminar, 2007). In this regard, OCCs are based on a change in the identity building of the individual. From an identity building based on a relationship with big projects, such as political parties or churches, there is a move to the development of a *networked individual identity*, "where individual self-identity – both in terms of the image one has of oneself and the image others have of one - can no longer be separated from one's position within a relational network" (Stalder, 2007; Wellman, 2001).

Furthermore, several empirical researchers have concluded that the motivations to participate in fulfilling the common goal are also very diverse (Benkler, 2006; Weber, 2004). Interestingly, researchers point out how OCCs are able to bring together people with very diverse political orientations (Coleman, 2004; Coleman & Mako, 2004).

However, interdependently of the linkage between the common mission and the individuals, the overall OCC environment, its architecture and its norms, is shaped by the fulfillment of

the common mission.

In order to transmit the relevance of the mission in defining the organizational choices it is interesting to compare OCCs with other forms of collective action. For example, in the frame of the global social movement, organizational choices are greatly influenced by methodological ideals (della Porta, 2009), that is, following specific methods (such as decision-making by consensus) is very present in the GJM's organizational choices. In contrast, OCCs are more characterized by choosing methods according to their effectiveness in fulfilling the mission. As a result, OCCs are characterized by methodological pluralism or polymorphism. That is, the coexistence of several working or decision-making styles. That is, there is no one single way to solve all the situations of the site, but a flexible approach that adopts several methods. It could also result in a heterarchy between the positions of participants.<sup>3</sup> In the famous FLOSS catchphrase, "rough consensus and running code" captures the sense that actions working towards the accomplishment of the mission are more valuable than the use of a precise method. The methodological pluralism of the OCCs might appear as a lack of coherence of the overall system. However, for some researchers, this apparently chaotic diversity becomes a powerful resource for knowledge making and innovation (Brown & Duguid, 1991).

For example, as previously presented, openness to participation is a key principle in OCCs. However, this does not imply that for every task the OCCs must follow the same method developed in a participative way, this may depend on the requirements for fulfilling each aspect.

This mission-oriented principle also implies that the organization follows a logic of accomplishing a collective goal, not a logic of representation of the people involved. This also explains the expectations and evaluations of participation distribution. That is, insofar as a distribution of participation in a 90/9/1 manner does not create an impediment to the accomplishment of the mission, unequal distribution will not be considered a problem.

Finally, it is worth mentioning that, when analyzing OCCs, this methodological pluralism should be recognized, instead of trying to reduce OCCs to just one of their expressions.

Concerning the case studies, Wikipedia's mission reads "Imagine a world in which every single human being can freely share in the sum of all knowledge. That's our commitment" (Source: Wikimedia Foundation main page ). In terms of how the mission shapes the expectations of participation, further research might give a more precise and complete picture of the variety of expectations, however, the way in which Sue Gardner, executive director of the Foundation, expresses it is significant: "we need sufficient people to do the work that needs to be done". "But the purpose of the project is not participation".

In terms of polymorphy or methodological pluralism, I observed that in Wikipedia most activity is developed in a form primarily based on open groups on specific articles using consensus decision-making. However the community combines this with a heterogeneous, sometimes secondary options mechanism to force decision-making, block the violation of policies and keep the process within certain margins. For example, on some occasions alternative forms of decision-making such as polls and voting are adopted. Heterogeneous

forms refers to hierarchies of administrators and other roles with other privileges, tasks assigned historically to respected individuals and a symbolic leader (the founder).

Concerning the opensf.net case, opensf.net does not have a mission in itself, but is a "tool" for support the working groups in their roles within a much larger process, the ESF, whose goal or motto is that to "change the world is possible" (Source ESF Web site main page).

This lack of a common mission specific to the platform could explain why the methodological pluralism of opensf.net is much more deep and of a different character than seen in the other case. Opensf.net is based on different projects or modules, like the other case. Each of the projects has similar features (e-lists, wiki pages, etc.). However, there is no fixed structure about what has to be done in each of the projects, as is the case for Wikipedia, where what can be done is loosely defined by the architecture of the space and norms. While in the other case methodological pluralism refers to different methods for solving different tasks, in opensf.net methodological pluralism refers to different strategies about what to do in opensf.net.

Each group at opensf.net adapts its use of the site to its own communicational strategies. This makes the incorporation of new participants into the opensf.net projects difficult, as a person must understand what each project is doing in order to be able to contribute. While in Wikipedia, modules share a similar structure, which makes the flow of people and content among them easier.

#### *f) Participation is based on autonomous individuals and volunteers*

Participation is autonomous, firstly, in the sense that each person has the autonomy to decide his or her level of commitment and in how he or she wants to contribute on the basis of personal interests, motivations, resources and abilities. The autonomy of participants in driving their actions favors decentralization. The distribution of participation is not based on the centralized planning of the action, but on decentralized, volunteer entrepreneurialism from the participants.

Secondly, participants are volunteers. They do not have a contractual labor relationship with the community, even if some participants may develop their contributions as part of their work outside the community (von Hippel & von Krogh, 2003). As a consequence, each participant assumes the costs of participation (in terms of time, connectivity costs, and education skills, among others), which results in a distribution of costs.

All the cases share these characteristics of autonomous and volunteered participation.

The volunteer character of participation could contribute to the scaling of participation or not: as far as people have the resources required to participate, they will be able to contribute.

The participants are able to contribute according to their own resources of time, skills or money. According to the civic voluntarism model (Verba, Schlozman & Brady, 1995), resources are a key factor in understanding why some people participate whereas others do



not. Resource-rich participants with free-time, connectivity, skills and money can contribute more easily than those without such resources, and so the resource-rich tend to be disproportionately represented among participants. In this regard, participation in OCCs could reproduce social and economical inequalities present in society. For example, looking at the gender distribution of participation at the opensf.net shows that only 36 % of active participants are women. While in the case of Wikipedia, previous research concluded that women accounted for 10% to 23% (Ortega, 2010; Glott, Schmidt & Ghosh, 2009).

However, the resource theories applied to OCCs could adapt their analyses to these types of organizational form. OCCs accommodate the different levels of availability and resources of participants. In this regard, it could be useful to apply resource theories according to different degrees of participation (active participation, weak contribution and lurking) - in other words, to analyze if there are systematic differences in distribution according to criteria such as age, gender, time, money or income, physical disabilities and the digital divide along the 90/9/1 principle.

Furthermore, the lack of resources may not be the only explanatory variable. Even people with the necessary resources may decide not to participate for a variety of reasons such as questions of identity or personality. For example, people who identify themselves as creative and/or are more adapted to public exposure may be more likely to participate.

Additionally, the costs (human force) of producing digital commons as assumed by the participants open another perspective for interpreting the sense of participation. Digital commons (partially or totally depending of the case) are accessible to third parties who do not contribute to their production. From this perspective, participation appears not as a "privilege", but as a contribution to society or a "donation".

#### *g) Participation is public and content is publicly accessible*

Most OCCs are public. Their public character has to do with external and internal requirements. External here refers to a communicative issue, the goal to spread the contents to the external world. The internal refers to organizational issues.

OCCs provide a public good or service, anyone can access their "outcome". This public character of the OCCs' outcomes is also referred to as free or open. The type of ownership of the content in OCCs, regulated by the license, promotes free access.

On some occasions, the type of license also favors the re-use of the content. In such cases, the content can be moved by someone else and it is possible to re-launch the interaction in a different direction. This is known as forking. However, not all the OCCs are based on conditions of forkability. According to the large-N analysis, free licenses over all content are present in 68,1% of the cases. 78 % of the OCCs use FLOSS, which also favors forkability, the remaining 18% use proprietary software.

Secondly, digital commons are developed in public, indeed it would be more accurate to say OCCs *live* in public. In this regard, from the large-N analysis of OCCs it emerged that in 88

% of the cases the content of communications among participants is publicly accessible. That is, it is possible to read the content of communications among participants without registering.

The public, or the transparent, character of the organizational process favors openness to participation. Participants can enter the organizational process without having to fulfill any previous requirement. Public organizing also favors the training of new participants. New participants can see how others perform some tasks. Finally, it also favors the autonomy and decentralization of participation and the coordination of participation without a predefined plan or gatekeeper to distribute roles. Participants can themselves identify where contributions are needed and at what level they wish to get involved.

In the Wikipedia case the whole process is visible to all, not only the resulting content. The channels that host the interaction (such as Wikis, mailing lists, IRC, meet-ups etc) are public by default.

In the case of *openesf.net*, each project creator may choose how public each project may or may not be. They decide whether the project will be accessible to the general public, only to people registered at *openesf.net* or only to members of that particular project. However, the majority of the projects have a public character.

#### *h) Participation is implementation*

Participation is mainly based on implementing tasks by directly creating or editing content. This is not a major risk. Online interaction facilitates the undoing of actions, and so mistakes are not irreparable. Plus, the content is conceived of as a permanent work in progress.

Participation as implementation is a major characteristic of participation in OCCs. As presented in the mission-oriented principles, the environment is shaped by the accomplishment of a goal, building a digital commons. Participants "build" or "do".

Participation as doing goes beyond participation understood as deliberation. The goal of the participation is not to put together opinions, argue about issues and/or take decisions. To participate is to implement decisions. Deliberation is developed through the doing and undoing of content. There is no separation between decision-making and implementation, nor between a delegation and an implementation body. In this regard, this form of participation goes beyond the principle of participation as it is understood in participative democracy. Participation is not understood as a consultation about a decision to be implemented by public institutions. Instead, participation is engaging in building non-state public services. Furthermore, participation is not a consultation on the use of collective public resources (such as the participative budgeting approach) but, in line with the autonomous character of participation, the participants themselves assume an important part of the costs of the activity.

This form of participation opens up the idea of "doagraphy" or "implementation democracy". Implementation democracy in terms of participation as builders rather than as opinion

holders. Doagracy in terms of who decides on (and assumes the costs of) actions. The logic is not to do with the representation of visions, but the logic of aggregating forces to develop a common goal, where whoever does more has more capacity to "decide". In this sense, it comes closer to the logic of economical democracy (but instead of capital, the key resource is time) than representative democracy.

Concerning the case studies, in Wikipedia, in some cases participants deliberate among themselves before they edit the articles (Viegas, Wattenberg, Kriss & van Ham, 2007). However, even in these cases deliberation among participants is not geared to providing an opinion in a consultation exercise as part of a delegation, but to implementing changes in the platform. Furthermore, Wikipedia forms a "doagracy" in two senses. On the one hand, whoever takes care of a particular part of an article decides about it, including defining the policies that will govern that article. On the other hand, the control of the system is about the ability to bring together forces which will act, more than favoring opinions.

## Conclusions

OCCs constitute forms of collective action based on virtual environments that result in the provision of a digital commons.

OCCs share a common pattern regarding the distribution of content contribution. The quantitative analysis of participation in OCCs shows that strong inequalities in contributions among the participants is a characteristic of these types of collective action. The 90/9/1 principle refers to this unequal distribution of contributions, that is 90% of participants lurk or act as an audience, 9% make minor contributions and 1% are very active participants. The exact percentage among these three profiles may depend on the contents and culture of each community. Furthermore, the review of the opensf.net case has shown that the percentage of these three features might depend significantly on how content contribution is conceived. In this regard, the 90/9/1 principle might be adopted as an approximation, while a comparison of participation in OCCs would require the establishment of shared indicators of participation, although the high variability of OCCs makes it difficult to define common indicators.

While much literature has pointed to the unequal distribution of participation, there is a lack of analysis of the main organizational characteristics which could allow us to better understand it. From this analysis it was found that the main organizational principles of OCCs are: a) the environment is open to participation; b) participation has multiple forms and degrees of integration; c) the environment is structured and modular which results in a decentralized but connected participation; d) participation is asynchronous; e) the environment is framed by a common-mission. The methods are shaped by the specific questions to answer, resulting in a methodological pluralism; f) participation is autonomous in the sense that each person decides which level of commitment he or she wants and in what aspects he or she wants to contribute. Plus, participation is voluntary. Participants are not linked by a contractual relationship and participants assume the costs of participation; g) participation is in public, that is, its outcome is available for others and the organizational

process is transparent; and h) participation is implementation.

### *Ecosystemic Participation?*

The analysis of the organizational characteristics exhibited by OCCs suggest that they can be usefully regarded as interactive systems (Bateson, 1972; Goffman, 1983; Luhmann, 1995). From this perspective, I propose the concept of ecosystemic participation in order to stress the creating of eco-systemic, feedback and synergistic effects between the diverse forms of participation present inside the OCCs. Furthermore, the term ecosystemic participation highlights the co-dependency and mutual adaptation of the different forms and degrees of participation in order to find an equilibrium between them for the sustainability and effectiveness of the common mission. Organization principles mentioned previously including openness, autonomy, decentralization, transparency and implementation provide the conditions for ecosystemic participation.<sup>3</sup>

With this paper and the proposal of the concept of ecosystemic participation, my aim is to go beyond the mere recognition that the 90/9/1 principle is present in most OCCs; and also to move beyond the "fascination" that causes us to assess why the 90/9/1 principle is also present in many other fields of collective action (such as hyper-links or income distribution). This concept aims to look to how it works, that is, to better understand the functioning and organizational principles of the OCCs which result in the unequal distribution of the participation. More specifically, I look at how they work, rather than looking at the 90, 9, and 1 in isolation, by introducing the interdependency between them into the analysis.

Furthermore, this ecosystemic participation concept is grounded in the deconstruction of the approach to participation as single acts.

On the one hand, I deconstruct the dichotomous approach to participation. The forms of participation in OCCs cannot be reduced to binary schemes. In this line, Bimber, Flanagan and Stohl suggested that recent uses of NTI for collective action challenge the notion that there is a binary choice between participation or not (2005). Ecosystemic participation shifts the focus away from single and unequivocal dimensions (to participate or not participate), towards the development of dynamics in complex cohabitation and the co-evolution of diverse forms and degrees of participation.

Furthermore, these different forms and degrees of participation are integrated, each playing

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<sup>3</sup> Finally, ecological or systemic approaches have a variable and long tradition and can be adopted in several senses. In this regard, it might be worth mentioning that the specific sense of the eco-system which I refer to here relates to the "internal" dynamics of the individual participants in each OCC. Other authors, also from an evolutionary perspective, use the ecological approach to refer instead to the interrelations through communication networks among organizations or collective actors in a shared space (Monge and Contractor, 2003; Monge, Heiss and Margolin, 2008; Monge and Poole, 2008; Shumate, Fulk and Monge, 2005; cf. Powell et al., 2005). This must not be confused with the ecological ethics of technology, which refers to the environmental issues related to technology (Maxwell & Miller, 2008). Or ecology media which is a systemic approach to communication that analyses the role that media play in influencing meaning and mind, ways of life and worlds views (Barner & Strate, 2008, p.16).

its own role. In this regard, ecosystemic participation deconstructs the view of unequal participation (through the 90/9/1 principle) into the independent layers of a pyramid. Instead these three degrees 90/9/1 are interdependent. The mechanisms of interdependency between them could change across time and size of the community.

In this line, the different levels of participation (strong participation, weak and non-participation, weak and strong participation) play a role and are integrated and complement each other. Active and committed participants are important to start the online community and assure most of the content; weak participation allows vast and diverse fields of information resources to be reached; and unintended participation improves the system, and as audiences increase, the value and relevance of the content and the participation in the site.

On the other hand, the concept of ecosystemic participation moves away from an analysis of participation as an isolated act to an analysis of participation as an act coordinated with others and the overall collective action. An individual decides his or her role according to the overall stage of participation and acts strategically to fit into the overall equilibrium of the collective action. In this regard, individuals shape the form and degree of their participation according to the overall collective process.

### **Future Research**

Furthermore, I consider the adoption of an ecosystemic participation approach adequate for future research. Ecosystem participation problematizes the analytical and methodological designs centered on framing participation as an isolated individual activity and/or centering analysis on only one of type of participation. For example, it is frequent in the literature for the analysis to focus only on strong participants.<sup>4</sup> In my view, these designs are limited and most importantly inadequate. Instead, I argue that to integrate and consider the different forms and degrees of participation in the research design is appropriate. However, obviously, to integrate an ecosystemic approach in the analysis of participation is clearly a methodological challenge.

Finally, there are several reasons which explain the unequal distribution of content generation and why some people in the online community do not participate. From my analysis, it emerged that, in part, the unequal contributions could be associated to the ecosystemic approach to participation in terms of accommodating and combining several degrees of availabilities for contributions. Additionally, an observation which also emerges from my analysis is that the 90/9/1 principle could be related to a phenomenon of multiple-belonging. The distribution of the participation resources of each individual among the several OCCs he or she could belong to result in the unequal distribution of participation in each OCC. For example, belonging to several groups could explain the weak contribution. A person belonging to several groups could distribute his or her contributions among the groups she or he belongs to. In this line, empirical research on the Global Justice Movement also highlights the multiple-belongings or distribution of activists' participation across groups (della Porta,

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<sup>4</sup> Fed by the Habermasian view that speaking out is more valuable than silence.

2004). Multiple-belonging is also present among Wikipedians. According to my interviews, amongst Wikipedians it is common that a person has a “home project” where they concentrate their efforts and then on occasion weakly contribute to other secondary projects (Interview Jon Davis, Wikipedian, Berkeley, November 2008; Interview Betsy Megas, Wikidictionary, Palo Alto, November 2008). Further research, adopting field-level analysis and individual-centered analysis instead of case-centric analysis, is required in order to fully verify this hypothesis.

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#### Empirical Material Mentioned

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Interview Howard Rheingold, Palo Alto, December 2009

Interview Jon Davis, Wikipedian, Berkeley, November 2009

Interview Rand Montoya, Wikimedia Foundation Head of Community Giving, San Francisco, December 2009

Interview Tomasz Finc, Wikimedia Software Developer, San Francisco, November 2009

Transcripts discussion on web communities, Networked Politics Seminar, 2007