How much are digital platforms based on open collaboration?

An analysis of technological and knowledge practices and their implications for the platform governance of a sample of 100 cases of collaborative digital platforms in Barcelona

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From the early cases of FLOSS and Wikipedia, the digital collaborative model of production and consumption has rapidly expanded to other spheres. This article explores to what extent this expansion has maintained the open character of the initial model, specifically the extent to which platform projects follow an open collaborative approach in their technological and knowledge policies and practices, and if this is also reflected in an open approach to governance. The empirical analysis is based on a sample of 100 cases in Barcelona. On the basis of this analysis, we conclude that open modalities of collaborative digital platforms are not prevalent. Around a third of the sample present open modalities of the dimensions analyzed. Different areas —technological, knowledge, or governance— showed different levels of diffusion of open practices. The cases which tended to be open in one dimension also tended to be open in the other dimensions. That is, the analysis points to a correlation between technological, data, and knowledge policies and open and democratic collaborative economy models. These results suggest the importance of open technology and knowledge in adopting an open and democratic collaborative model.

H1: *Open technological and knowledge practices tend to reinforce each other.* That is, more technological openness is connected to knowledge openness in collaborative digital platforms.

H2: *Technological openness tends to favor more open governance of collaborative digital platforms.*

H3: *Knowledge openness tends to favor more open governance of collaborative digital platforms.*

The **methodology** is based on the statistical analysis of a sample of 100 cases present in the city of Barcelona. A **"codebook"** [5] for data collection—a set of indicators related to the analysis variables—was employed. **Data collection** was based on two methods: web collection and a structured interview. Web collection was based on digital ethnography of the web platforms. It was performed in 100 cases. In addition, we performed a structured interview with 50 of these 100 cases. Finally, during data collection, "field notes" of general impressions were kept in a field book in order to have detailed qualitative data about study cases.

Technological practices and policies openness refers to the adoption of software and technological architecture that favor freedom and openness.

We have adopted as indicator the type of license of the software code the platform uses, categorizing the licenses depending on their degree of favorability to openness, or "freedom" and priorizing the robust licenses (copyleft). Regarding technological architecture, two indicators have been adopted. First the type of technological infrastructure on the platform. We categorized these, from more open to less, considering, at the same time, reproducibility (the availability of source code as FOSS) and distribution (which would range from p2p to federated to centralized). The other indicator considered is the use of blockchain (Yes/No) with the objective to decentralize the platform's technological architecture and open up the community participation.

Knowledge policies take into account two types of elements: content and data. The content element refers to the type of user-generated content license. The license used and their categorization from more open/free to less. Regarding data policies, the indicator adopted is the ability to access data generated by users, taking into consideration their agreement.

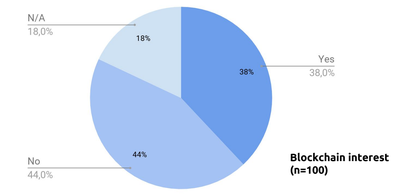
Governance consider several dimensions of governance and the extent to which they adopted an open modality. In that sense, we evaluate governance among value creators at the platform interaction level (matching platform functionalities with the grade that users can participate) and the governance regarding platform provision (considering legal constitution, policies of participation and transparency):

- The openness of the management of contributors, considering: the ways users can contribute to the platform content, the policy of platform participation, the possibility of user interaction and the types of user accounts considered by the platform.
- The openness of the election of administrators.
- Decision-making with regard to community interactions, including whether or not there are formal or informal systems for community decision-making, and if the definitions of the formal rules and platform policies are open to user contributions.
- The type of legal entity and the options for community members to engage with each type of legal entity.
- Finally, governance linked to economic management, considering economic transparency and openness in deciding the destination of project benefits.

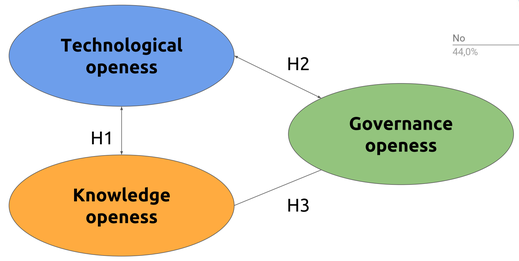
Type of license (n=100)	Percentage of use
Public domain	2.97%
CC BY	7.92%
CC BY-SA	11.88%
CC BY-NC	7.92%
CC BY-ND	1.98%
CC BY-NC-SA	2.97%
Copyright	36.63%º
No license	23.76%
N/A	3.96%

Type of license (n=100)	Percentage of use
Public domain	2.97%
CC BY-SA 3.0	3.96%
GPLv2	10.89%
GPLv3	3.96%
AGPL	3.96%
LGPL	4,95%
MIT license	4.95%
Open Source License	3.96%
All rights reserved	33.66%
No license	19.80%
N/A	6.93%

Type of architecture (n=100)	Percentage of use
Peer-to-peer	10.89%
Centralized reproducible (FLOSS)	18.81%
Centralized FLOSS	5.94%
Not reproducible	44.55%
N/A	19.80%



Type of data exportation (n=100)	Percentage of use
API without restrictions	5.94%
Free downloadable in whole	10.89%
API with some restrictions	1.98%
Free downloadable in part	1.98%
Not possible to export, copy or API access	53.47%
N/A	25.74%



Management of contributors	Type of form	%
G1. Openness to contribution on the digital platform (n=100)	Creating new ways of adding content	7.9%
	Creating contents with others	31.7%
	Offering, demanding, rating products or services	42.6%
	N/A	17.8%
G2. Policy of platform participation (n=100)	Publication without filters	35.6%
	Moderated previous publishing	25.7%
	Moderated after publishing	2.0%
	N/A	36.6%
G3. Users can be part of groups and/or communicate among them (n=100)	Yes	57.4%
	No	24.8%
	N/A	17.8%
G4. Different types of account with diverse levels of permission (n=50)	No	28%
	Yes	60%
	N/A	12%
G5. Administrators election (n=50)	Self-appointed	28%
	Privileges gained automatically by participation	2%
	Elections among general community	2%
	By other administrators	4%
	Selected by infrastructure provider with mechanisms of community representation	2%
	Selected by the infrastructure provider	30%
	Historical role (star)	2%
	Selected by founders/leaders/board	12%
	N/A	18%

Governance linked to economic management	Type of form	%
G9. Decision of the platform's economic benefits	The whole members	40.0%
	Platform owners	50.0%
	N/A	10.0%
G10. Economic balance accessible to the members of the legal entity	Yes	76.0%
	No	16.0%
	N/A	8.0%
G11. Economic balance being provided publicly	Yes	38.0%
	No	46.0%
	N/A	16.08%

Decision-making with regard to community interactions	Type of form	%
G6. Decision-making systems in place for the community	Yes, formally defined	50.0%
	Yes, informally defined	6.0%
	No	40.0%
	N/A	4.0%
G7. Users can participate in the definition of formal rules and policies	Yes	54.0%
	No	34.0%
	N/A	12.0%

The **conclusions** have two premises that must be located. On the one hand, as a case study of the city of Barcelona, the conclusions are partly extrapolated to other cities. On the other hand, the generation of criteria to define and categorize the technological, knowledge and governance openness of collaborative economy platforms has its own controversies and limitations.

The area with the greatest presence of openness is that of knowledge practices in concrete user-generated content, as open practices are present in 35.64 % of the sample. In knowledge practices relating to data openness, however, it goes down to 20.79% of the sample.

Openness of technological practices in the three modalities investigated was not practiced by the majority, but open options constituted more than a third of the cases (39.6% of the projects are based on a free software license, 35.64% are based on open architecture, and 38% of the projects have interest in exploring other forms of decentralized technology). Two factors may explain this result. The first is the desire to restrict use of the website's software to the platform owners. The second is the low level of attention to software, content license, and open data exportation in the growing platform cooperativism model (cooperatively owned, democratically governed businesses that establish a digital platform to facilitate the sale of goods and services).

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Regarding governance, the most prevalent points of openness are seen in the policies of publication without filters or moderated only before publishing (61.3%), the ability to create groups or communicate with other users (57.4%), and internal transparency (76%). The least-used openness policies regard the administrators' election (only 38% of platforms had a democratic or meritocratic process to elect administrators) and who decides the destination of the economic platform's benefits (only 40% were decided by whole community). Therefore, when we look into the core of governance —platform or economic administration— the grade of openness is lower than when we study openness about member participation. Still, overall open governance of the platforms was adopted by 38% to 61.3% (depending on the specific governance indicator), which constituted a higher diffusion of openness in terms of platform governance, compared to technological or knowledge practices.

We could conclude on the basis of the data that openness collaboration in platforms is not irrelevant, but it is not prevalent neither, as seen in around one third of the sample. Furthermore, the cases which tended to be open in one dimension also tended to be open in the other dimensions. This suggests that a segment of the overall platform ecosystem could be characterized as more open, while a larger segment is not based on any of the methods of openness considered. We have shown a connection between the indicators that define knowledge and technology policies, which, at the same time, are intertwined with governance. In that sense, our investigation suggests that openness in technology and data areas tends to also be reflected in other areas like governance. In spite of the relevance of the sample, however, the limited number of cases requires caution in analyzing its results and conclusions.

Regarding platform governance, we observe the active role of members in some key aspects of the democracy of the platform: defining the rules, involvement in the decision-making process, and internal transparency of the economic balance. We observed better open behavior in the realm of open governance than in the realms of technological, knowledge, and data openness. However, the correlation analysis shows that openness in participation, knowledge and technology are also connected to the governance of the project. To sum up, the results of this investigation suggest a better proliferation of governance openness models than open technological, knowledge, and data ones. The results also suggest the interrelated strength of these three dimensions in the promotion of the open collaborative ecosystem.

Technological openness (n=50)	Open software	Open. architecture	Block chain
Open software	1.00		
Open architecture	0.93**	1.00	
Blockchain	0.52*	0.56	1.00

Knowledge openness	Content license	Data export
Content license	1.00	
Data export	0.74**	1.00

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed)

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11
G1	1.00										
G2	-1.00	1.00									
G3	0.45*	0.39	1.00								
G4	-1.00	0.28	-0.11	1.00							
G5	1.00	-1.00	0.34	0.23	1.00						
G6	0.31	-1.00	0.53	-0.04	0.41	1.00					
G7	0.33	-1.00	-0.11	-0.04	0.76**	0.60*	1.00				
G8	0.74**	1.00	0.27	-0.03	0.70	0.58	0.55	1.00			
G9	0.16	-0.07	0.35	-0.18	0.63*	0.59*	0.66**	0.73**	1.00		
G10	0.27	-1.00	-1.00	0.11	1.00	0.46	0.71*	0.61*	0.61*	1.00	
G11	1.00	-0.02	0.11	-0.18	0.60*	0.29	0.55*	1.00**	0.56*	0.60*	1.00

Openness dimensions	Technological	Knowledge content & data export	Governance
Technological	1.00		
Knowledge content & data export	0.46**	1.00	
Governance	0.36**	0.38**	1.00

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