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Sustaining platforms as commons: perspectives on participation, infrastructure, and governance

This work finds its place within Participatory Design (PD) as a specific approach to co-design that focuses on the politics of technological innovation and socio-technical transformations. In particular, the article contributes to the repositioning of co-design in the age of platform capitalism by engaging with the question: *how can participatory designers approach interventions for the long-term sustainability of platforms as commons?* As the contradictions and limitations of platform capitalism become increasingly evident, to engage with such a challenge is a way to pursue PD's renewed political agenda. The article foregrounds the concept of *platforms as commons* to bring designers' attention towards those platform arrangements which are antithetical to platform capitalism exploitative ones. By building on Free and Open Source Software (FOSS), as a paradigmatic case of platform as commons, the article outlines *participation, infrastructure, and governance* as relevant perspectives for framing broad areas of sustainability concerns; and it articulates them along four approaches for supporting long-term sustainability in practice: maintaining, scaling, replicating, and evolving. Ultimately, this article provides participatory designers with a map of possible orientations to frame and support their work, research or interventions around the long-term sustainability of platforms as commons.

1 Introduction

Several concerns recently emerged against platform capitalism (Srniczek 2016). A phenomenon criticized for its pervasive use of business models that exploit social relations and private data (Langley and Leyshon 2017); for its constant search of profits maximization, and the disruptive consequences it has on the market sectors it acts in (Srniczek 2017); as well as for the demeaning working conditions provided to 'gig workers', where it acts as labour broker (Graham, Hjorth, and Lehdonvirta 2017).

Within the broad field of co-design and, specifically, of Participatory Design (PD), a reinvigorated political agenda spurs researchers and practitioners to be more alert of the social, cultural, economic, and political implications of innovation processes

and to be more proactive towards those ones that nurture, rather than impoverish, the common (Huybrechts et al. 2018; Teli, Lyle, and Sciannamblo 2018). Supporting the rise and consolidation of an alternative to platform capitalism provides a difficult, yet valuable, opportunity to pursue such agenda.

This article advances the idea of platforms as commons to conceptualize an alternative to platform capitalism that is able to nurture the common (Hardt and Negri 2009), and it engages with the renowned challenge that co-designers and PD scholars face when intervening in contexts that are open, de-centralized, and distributed. Here, participatory designers and their interventions are often perceived as external interferences due to the strong feeling of ownership and belonging, which members acquire through direct participation and commitment into these contexts, and to the blurred hierarchies that complicate the identification of proper gatekeepers and points of entrances (Iivari 2009; Carroll and Rosson 2007). At the same time, the unique and situated traits of each of these collectives make them demanding tasks to develop the proper understanding of the collectives' local cultures, socio-technical arrangements, and needs, on the one hand; and to enroll valuable participants into participatory design interventions, on the other (DiSalvo, Clement, and Pipek 2012; Luke et al. 2004).

In line with the reinvigorated political agenda of participatory design, this article engages with the following general question: *how can participatory designers approach interventions for the long-term sustainability of platforms as commons?* To answer this question the article will proceed as follows. First, it will advance the concept of *platforms as commons* and clarify its relationship with the concern on their long-term sustainability. Secondly, by leveraging on the extensive knowledge on Free and Open Source Software (FOSS), it will outline participation, infrastructure, and governance as relevant perspectives for framing broad areas of sustainability concerns. Third, it will

articulate such perspectives along four approaches for supporting long-term sustainability in practice: maintaining, scaling, replicating, and evolving (Iversen and Dindler 2014). Ultimately, this article makes a theoretical contribution to the repositioning of co-design in the age of platform capitalism by providing participatory designers with a map of possible orientations to frame their work, research or interventions around the long-term sustainability of platforms as commons.

2 Sustaining platforms as commons

Facebook, Google Maps, Uber, AirBnB, Foodora, Amazon Mechanical Turk epitomize our contemporary conception of platforms and platform-based services. Often, these platforms are also the harbinger of the problems and contradictions of platform capitalism mentioned above (Srnicsek 2016). However, outside the neoliberal and extractivist practices of platform capitalism, different configurations of platforms exist. Only to name a few: the federated, distributed, and open source social network *Mastodon*; the collaborative map and geolocation service *OpenStreetMap*; and the short-term rentals ethical service *FairBnb*. These platforms do not pursue constant maximization of profit. They are based on various arrangements for the shared ownership and management of both their infrastructures and services, or products, which can be easily grasped as contributing to the nourishment of the common rather than to its impoverishment (Hardt and Negri 2009; Teli, Di Fiore, and D'Andrea 2017).

Here, I propose to think about platforms as commons to refer to similar types of non-extractivist platforms that nourish the common. By summarizing a vast literature, we can think of a commons as an entanglement comprising a resource, a group of people, and a set of social protocols that promote commoning: the social practice of managing such a resource for everyone's benefit (Bollier 2014, 15). In platforms as commons, the set of socio-technical arrangements that is central to the nourishment of a

product or a service comes to the forefront as the shared resource that is collectively managed thanks to the social protocols and commitment of the people who, recursively, understand it as a commons: the *commoners*¹.

Platforms as commons are relevant because they remove exploitative property relations as the foundations of our political economy and replace such relations with the civic ones that define our bonds with each other. However, in order to promote this transition, such platforms shall endure over the long term and manage to mobilise the proper institutional capacity and alliances (Kostakis and Bauwens 2014). Therefore, the concern on their long-term sustainability is of paramount importance and not to be taken for granted. Simply put, two broad problem areas characterise this concern. One relates to the preservation of the distance or independence from the practices that are typical of platform capitalism. The other relates to the sustainability in practice of these platforms: the maintenance of the continuous endeavour of commoning around and of the platform. The two areas are partly intertwined, and the former is anything but marginal. However, due to space limitations and the available scholarly knowledge to build on, this article focuses on the latter.

Indeed, despite being portrayed as open and welcoming to broad participation, a remarkable collection of literature makes evident that the practical involvement of commoners and the coordination of their engagement and contributions are highly complex (Hammouda et al. 2012; Ingawale et al. 2009). Other problems, such as commoners' drop-out, alienation, and burnouts (Rozas, Gilbert, and Hodkinson 2015;

¹ By means of a simple example, in the case of the online encyclopaedia *Wikipedia*, commoners are not only those ones who write and revise articles, they are also the Wikipedia's software maintainers, the servers and database administrators, as well as the moderators for dispute and conflict resolutions, the fundraisers, and, to some extent, the donors.

Poderi and Hakken 2014), or the presence of gender bias and collective forms of marginalization and exclusions (Lin and Besten 2018; O'Neil 2014) pose serious threats to the potential of platforms as commons and to their long-term sustainability.

2.1 PD, the commons, and the forms of sustainability

Recently, the politically engaged and 'activist' areas of PD started addressing the commons and the practices of commoning as fruitful approaches to foster positive change (Seravalli 2018; Marttila, Botero, and Saad-Sulonen 2014; Seravalli, Eriksen, and Hillgren 2017). At the same time, over the years, few scholars looked at the domain of Free and Open Source Software and other grassroots movements as a means to advance the theory and practice of PD, as a field grounded around the principle of participation (Haskel and Graham 2016, 2014; Hakken et al. 2008). Nevertheless, the topic of how PD scholars can support the long-term sustainability of commons and commoning practices in the domain of ICT platforms is largely unexplored. For notable exceptions partly targeting this issue from different perspectives see (Teli, Lyle, and Sciannamblo 2018; Marttila and Botero 2017) and (Bassetti et al. 2019; Carroll and Beck 2019).

PD scholars have always been concerned with ensuring enduring gains for participants involved in design processes and for those ones directly affected by their outcomes. However, the challenges of achieving long-lasting influence have been absorbed, and thus resolved, in the attempts to foster mutual learning. This includes issues such as finding common ground between designers and participants, establishing trust, and sharing power, which are all considered means to provide researchers and designers with the proper knowledge of situated use practices, thereby implicitly allowing them to tackle long-term sustainability (Bratteteig and Wagner 2012). A renewed interest on the topic of sustainability brought to the fore newer understanding

and approaches (Poderi and Dittrich 2018). In particular, Iversen and Dindler suggested four ideal typical forms of sustainability as design orientations: maintaining, scaling, replicating, and evolving (2014).

- In *maintaining*, the scope of PD interventions is to identify and support means allowing the target initiative to remain as it is for the long term and after the PD intervention is completed;
- In *scaling*, the PD interventions aim at supporting a transformation of the context that surrounds the initiative, which remains relatively stable. Typically, it helps transitioning them from small to larger groups and organisational context, or to reach out to larger numbers of end-users and stakeholders;
- In *replicating*, PD interventions supports the rise of new initiatives that are greatly inspired and similar to previously existing ones, but which are grounded onto different contextual domains;
- In *evolving*, the scope of PD interventions is to support a substantial transformation of the original initiative at the level of its main scope and context.

As further detailed in their work², these orientations can guide participatory designers during the various stages of their work. Before work begins, these ideal typical forms can be used to articulate ambitions and strategies; during the designing work, they can help reflecting on and steering the ongoing process; and after the work

² For a detailed explanation of the possible use in practice of these approaches, I defer readers to Iversen and Dindler's work (2014).

has been completed, they can be used to assess and reflect on whether or not the initial expectations have been met (Iversen and Dindler 2014, 157).

3 Perspectives on long-term sustainability: insights from the case of Free and Open Source Software

Free and Open Source Software (FOSS) started in mid '80s as hacker counter-culture phenomenon against the emerging paradigm of capitalist software production and retail (Söderberg 2007). It rapidly grew to become a recognised mode of software and knowledge production and a fundamental actor in contemporary ICT infrastructure. FOSS studies accompanied the development of this phenomenon and grew substantially to encompass contributions by fields as business, management and innovation studies, as well as computer science, software engineering, and more recently, sociology and anthropology (Crowston et al. 2012). This section will outline the themes recurring more prominently in relation to the evolution and long-term sustainability of FOSS instances; namely, participants and participation; infrastructure for collaboration; and governance. I approach these themes as complementary perspectives rather than as discrete and somewhat autonomous components of FOSS, *i.e.* there is no participation, infrastructure, or governance as unbounded by each other.

3.1 Participation

Participation in FOSS concerns a heterogeneous set of activities that can range from developing and maintaining new code to submitting bug-reports, from writing documentation to providing end-users support and making feature requests.

Participation is largely organized on volunteer-based contributions and self-selection of tasks. As such, a constant challenge that FOSS initiatives face is to ensure an adequate number of participants who are able to contribute to the various areas and activities of

the initiative.

It is renowned that the end-users base of FOSS initiatives is a valuable resource for the sustainability of these initiatives. It provides prestige to the software itself, it ensures a constant testing of the software, it provides ideas for further developments, and it is an important source of new potential contributors (Crowston and Howison 2006; Barcellini, Détienne, and Burkhardt 2008; Nakakoji et al. 2002). At the same time, it is established that people contribute to FOSS for a variety of reasons, typically distinguished as *intrinsic* – e.g. the act of contributing can provide fun or opportunities to develop a skill - or *extrinsic* – e.g. contributing can give recognition also outside the initiative (Krishnamurthy 2006). Fostering an environment that is open to new contributors and that leverages on participants' motivation is important, but is not enough in the long-term perspective. Indeed, in FOSS, expertise, role, status, and authority are not participants' given qualities. They are acquired over time through participation.

Participation as a socialization process implies nurturing an identity and learning the practices that characterise the activities of each FOSS instance (Ducheneaut 2005). Situated learning means that newcomers, and peripheral participants, find mentors to support them in developing, through a learning-by-doing approach, the necessary skills and the proper understanding of relevant policies or norms: each FOSS initiative accepts bug-fixes, but each of these has its specific set of tools, standards, and protocols that define what acceptable and valuable bug-fixes are. At the same time, developing an identity means that through their various contributions participants become recognizable by other members (Zilouchian Moghaddam, Twidale, and Bongen 2011). These aspects are also inherently political. Indeed, participants collectively discuss and negotiate the value, meaning, quality, and convenience of contributions. They are not objective and

technical qualities of, for instance, a bug-fix. Therefore, the ability of participants to understand their contributions as also political tightly relates to their learning and identity building processes (Ducheneaut 2005). In this light, for FOSS initiatives it emerges as equally important to encourage new participants to start contributing as well as to retain existing ones on the long term, because they are the most adequate to act as mentors (Fang and Neufeld 2009).

3.2 Infrastructure

The set of ICT tools that constitute the technical side of FOSS collaborative infrastructures plays a crucial role in enabling, shaping, and defining both geographically dispersed participation and coordination of contributions. Over time, each FOSS initiative nurtures a very specific infrastructure to support production and work oriented activities, as well as communication and outreach ones. The following generic tools often form the founding blocks of such infrastructures: (i) version control systems, which allow developers to manage code changes and to plan software releases; (ii) bug-tracking tools for monitoring new and fixed bugs; (iii) tools for handling software and end-user documentations; (iv) communication channels to support interactions within developer teams and among end-users; and (v) websites that are used as entry point into the initiatives and as outreaching tools (Fogel 2006).

Many initiatives rely on services such as SourceForge, which provide all these tools unified under the same platform. Alternatively, FOSS initiatives can assemble their own infrastructures by choosing dedicated tools³ for each activity. However, as the needs satisfied by these tools and the use practices they support change with time, FOSS

³ Often, these tools are also Free and Open Source Software.

initiatives also need to change and adapt their infrastructures. This can happen either by changing the specific configurations of the tools (*e.g.* changing who, and under what conditions, receives a certain set of use rights) either by replacing or complementing tools with other new ones (*e.g.* replacing the bug-tracker system with another one).

These changes are non-trivial for FOSS initiatives: they can potentially boost or reinvigorate an area of activity, but they can also disrupt or undermine such activity. Indeed, these tools are inextricably connected to the social practices of use that define a given FOSS initiative. Replacing a tool or configuring it in a different way necessarily alter such practices (Rodríguez-Bustos and Aponte 2012; Crowston and Howison 2005). As such, FOSS initiatives rarely treat changes at the level of the technical infrastructure from the technical point of view only. FOSS initiatives face two major and renowned challenges in maintaining their infrastructures. One concerns the need to balance the accessibility and usability of the tools for the newcomers, with the advanced technical needs of core and long-term contributors (Reagle 2007). The other relates to maintaining the communication between non-participants - *i.e.* end-users - and core contributors – *i.e.* developers – transparent and open for the former without becoming overwhelming for the latter (Rantalainen, Hedberg, and Iivari 2011).

3.3 Governance

FOSS governance is usually defined as “the means of achieving the direction, control, and coordination of wholly or partially autonomous individuals and organisations on behalf of an OSS development project to which they jointly contribute.” (Markus 2007, 152). Governance helps solving collective action dilemmas, tackling coordination challenges, fostering a welcoming environment for participation, and providing a sense of identity and autonomy to each FOSS initiative.

It embeds the following principles (O'Mahony 2007): (i) *independence*, as the impossibility for one single entity to have exclusive authority over the whole initiative; (ii) *pluralism*, as the coexistence of different or even contrasting voices; (iii) *representation*, as the possibility for contributors to be represented in community-wide decisions; (iv) *decentralised decision-making*, as the distribution of decision-making rights to different groups, entities, or individuals; (v) *autonomous participation*, as the possibility for individuals to define and explore the extent of their contributing efforts. These principles materialize in the following elements, regardless of the degree of formality or informality that these have in the initiatives (Markus 2007, 158):

- (1) *Ownership of assets*: the licenses and/or formal legal organisational structures;
- (2) *Project charter*: the vision about project and community goals;
- (3) *Community management*: the rules and norms about what it means to be a member and how people can contribute;
- (4) *Software development processes*: structures and rules that address operational tasks, such as assignment of people to tasks, and software release control;
- (5) *Conflict resolution and rule changing*: the rules and procedures for resolving conflict and for creating new rules;
- (6) *Use of information and tools*: the rules and norms about how tools can be used.

Over time, FOSS initiative faces changes due to emerging challenges and priorities. For instance, more and newer software features call for more developers and maintainers, as well as, more people who provide documentation and end-users support. These might materialize in a renewed self-understanding of how an initiative shall govern itself and might prompt changes at the level of community management or development processes (Sadowski, Sadowski-Rasters, and Duysters 2008). At a more general level, FOSS initiatives usually transition from an informal (or 'spontaneous') form of governance to

a more formal one. For instance, initially, the technical affordances of the collaborative infrastructures 'rule' - *e.g.* those who have writing rights to the code repository are, de facto, full developers and have the highest authority. At later stages, explicit policies would emerge concerning how to become a contributor and what rights or duties that entails.

Furthermore, it is common to see hybrid forms of FOSS governance where FOSS community-based initiatives intertwine with businesses and/or formal organisations (Shah 2006). These can range from not-for-profit organisations, as legal entities that act as intermediary in the market or legal disputes and that emerge from within the initiatives themselves; or they can take the forms of full-fledged shared ownership of the software legal assets by businesses or public administrations (Laat 2007). In the end, it is worth acknowledging that these transformations do not necessarily follow a linear path. New initiatives can emerge as autonomous and with their own governance as forked out from other FOSS initiatives (Nyman and Lindman 2013; Gamalielsson and Lundell 2014), they can rise from a company decision to release software under FOSS licenses or out of institutional and publicly funded projects.

3.4 Drawing things together

Despite having matured from a hobbyist movement into a crucial infrastructural component of contemporary ICT, FOSS initiatives constantly face long-term sustainability concerns (*e.g.* a high number of abandoned projects, or issues of inclusivity and predominance of male contributors). By relying on FOSS literature, this section outlined participation, infrastructure, and governance as relevant perspectives for framing broad areas of sustainability concerns. In order to extend these insights to platforms as commons, these can be summarized as follows:

- Participation as a socialisation process. This process equally concerns non-participant commoners, new, and long-term ones. It frames them as symbiotic actors in the co-construction of individual and collective identities, the development of skills and roles, as well as the politics of participation itself.
- The infrastructure as a complex set of tools binding together the technical and social dimensions of participation. As such, it is in constant need to balance the usability of tools for newcomers with their efficiency for more experienced ones, and to keep in contact the various people involved in the socialisation process, without making communication overwhelming for any of them.
- Governance as the material representation and the matter of principles that emerge as means to achieve coordination and to solve collective action challenges. It evolves and adapts fluctuating between formal and informal means, or institutional and spontaneous ones.

4 The articulation of ideal typical forms of sustainability

The article introduced earlier four ideal typical forms of sustainability used by participatory designers to frame and guide their work. The previous section highlighted three perspectives relevant for the long-term sustainability of platforms as commons. Here, Table 1 further articulates these aspects. By intersecting the four approaches to sustainability interventions with the three possible areas of concerns, the table provides a map that can support PD scholars in working to nurture an alternative to platform capitalism.

Table 1 The table articulates the perspectives of participation, infrastructure, and governance across the four ideal typical approaches to long-term sustainability: maintaining, scaling, replicating, and evolving.

	MAINTAINING: consolidate the existing	SCALING: expand the existing	REPLICATING: reproduce the existing in new contexts	EVOLVING: experiment with and diverge from the existing
Participation	Ensure viability of role transitions (e.g. from non-participant to new contributor), and preservation of existing ones (e.g. prevent long-term contributors from leaving)	Increase number of end-users/non-participants, new contributors, and long term contributors (e.g. by improving documentation for participating, increase outreaching efforts)	Reinvigorate waning engagement by involving participants into a new platform effort (e.g. launch a new platform effort by leveraging on existing common interests)	Diversify opportunities to contribute and type of roles (e.g. institute a new type of moderator for the forum community management)
Infrastructure	Identify and solve problems related to accessibility and use of existing tools (e.g. issue tracker too difficult to use)	Increase capacity or number of tools (e.g. open mailing list subscriptions to wider audience, increase repositories size, create new bulletin forums)	Reproduce and adapt a set of platform tools with their configurations for a new platform effort (e.g. open a new project account in SourceForge)	Identify areas and types of contribution that could benefit from a novel tool (e.g. Substitute end-users support forum with stack exchange sites)
Governance	Improve understanding of and compliance with the means of governance (e.g. clarify and make more evident Code of Conduct, if this is often disregarded)	Expand reach or scope of the means of governance (e.g. widen scope of the Code of Conduct)	Use the means of governance from the existing platform effort as 'template' for a new one (e.g. copy and adapt existing Code of Conduct and any other governance aspect, while respecting license conditions)	Introduce new means of governance (e.g. establish a Code of Conduct, if not present; establish a formal organization to take care of specific aspects, such as ownership of assets)

Rather than a 'cookbook' of solutions to be used uncritically on long-term sustainability challenges, this table presents specific points of entrance to guide designers along their work. As tangled ensembles of commoners, resources, and protocols (Bollier 2014), to intervene for supporting platforms as commons always means to intervene on concrete aspects that, directly or indirectly, concern all three perspectives. Furthermore, as commons, these platforms are in a constant state of transformation, because, as Kelty clearly put it, these ensembles are "vitaly concerned with the material and practical maintenance and modification of the technical, legal, practical, and conceptual means of [their] own existence" (2008, 3).

In this context, the map helps designers focusing on specific logic of sustainability interventions and perspectives; and it helps them keeping such focus stable along the design process (Iversen and Dindler 2014). Participatory designers can initially use the map to explore and clarify, together with the interested commoners, a logic of intervention and an adequate perspective; *e.g.* scaling participation. As the design process unfolds, the need will emerge to confront with the concrete and situated configuration of the platform's infrastructure and governance and to negotiate the details of the intervention. In such an intricate setting, the table would help keeping the main initial interest in focus. In practice, this might end-up being a reformulation of the guidelines for becoming a commoner in such platform, in the adoption of a more intuitive tool for the coordination of commoning practices, or both. Nevertheless, in the end such an intervention should be constructed, understood, and appropriated by the commoners as an effort to scale participation.

In short, such a map provides a reference frame and a scaffolding tool for acting within complex settings and for pursuing challenging goals. It does not replace the need to properly understand the situated needs, culture, and context of each platform or, more importantly, to co-construct interventions with the commoners' direct involvement, following participatory design practice. Furthermore, the following limitations, or points of attention, should be kept in mind. This work approaches the long-term sustainability of platforms as a matter that is internal to the platform itself. While the resilience of these platforms and their ability to reconfigure themselves around unexpected, external events can be considered one of their strengths, participatory designers should not lose sight of the broader political economy of the domains these platforms act in. As mentioned in the beginning, fostering an alternative to platform capitalism also implies helping alternative platforms to maintain distance and independence from the practices that characterise platform capitalism in the first place. At the same time, the perspectives provided here come from the available knowledge and understanding of FOSS, which, despite the heterogeneity of initiatives that comprises, is a specific type of platform as a commons: one that concern software. Since the proliferation of platforms cover today a great variety of domains and typologies of services, the three perspectives might be limited to cover the sustainability challenges that some specific platforms face. In particular, the role of the materiality of the service or product, which is supported by the platform, is an additional perspective to investigate in future studies.

5 Conclusions

This article engaged with the concern about how participatory designers can sustain the rise and consolidation of an alternative to platform capitalism that nurtures the common. The article pointed towards the concept of platforms as commons. It focused on the

perspectives of participation, infrastructure, and governance, and it articulated such perspectives across four approaches to sustainability interventions: maintaining, scaling, replicating, and evolving. In so doing, the article contributed to the repositioning of co-design in the age of platform capitalism by providing participatory designers with a scaffolding tool they can use to frame and guide their work, research or interventions around the long-term sustainability of platforms as commons. Ultimately, this can help those co-designers who are engaged with the pursuit of a reinvigorated political agenda of the field and are interested in working for an alternative to platform capitalism, to foster a platform ecosystem that nourishes the common.

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