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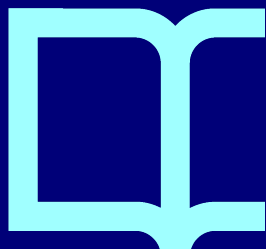
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Co-creation applied to public policy: a case study on collaborative policies for the platform economy in the city of Barcelona

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ABSTRACT

This paper addresses how far co-creation methodologies can be applied to policy-making innovation in the platform economy. The driving question is how co-creation collaboration-based policy-making can increase diversity and strengthen the participation of actors. The analysis is based on a three-year case study on the platform economy in Barcelona, describing how co-creation dynamics contributed to the participatory definition of local public policies and agenda. The methodology is based on participatory design techniques, involving participant observation and content analysis. Results indicate that co-creation can increase participation diversity aligning academic, economic, and social viewpoints in policy innovation from a quadruple helix perspective. In addition, collaboration schemes assist in engaging a wide diversity of participants in the policy ideation process which, in this case, resulted in 87 new policy measures, with contributions from more than 300 people of different backgrounds and perspectives. The case study demonstrates the value of a cycle of collaboration going beyond mere symbolic engagement or citizen support to public policy-making. It further shows the importance of combining co-creation with methods of action research, strategic planning and knowledge management, as well as with face-to-face interactions and online channels.

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1. Introduction

The adoption of digital technologies of information and communication (ICT) has facilitated a myriad of collaborative co-creation dynamics (Ramaswamy and Ozcan 2018). Considering co-creation as a broad term that refers to processes of collective creativity (Sanders and Stappers 2008), the concept has attracted research interest from several fields. There is currently a significant corpus of literature on co-creation associated with many diverse topics and application areas. In parallel, collaborative dynamics in the Network Society, due to new communication possibilities offered by ICT, have not only had an unprecedented impact on society (Castells 2004), but also on the action of governments, their administration and the development of public policies (Bovaird 2007).

This applies to the platform economy (also called *sharing economy* or *collaborative economy*), which refers to the collaborative consumption and production of capital and labour among distributed groups supported by a digital platform (Fuster Morell 2018). As a global phenomenon based on ICT, the platform economy is growing rapidly and exponentially, becoming a priority for governments and cities worldwide (Codagnone and Martens 2016). The rise of the platform economy has affected many policy areas and involved a plurality of approaches (Hong and Lee 2018). Its novel character makes it a particularly suitable sector for the deployment of collaborative policy-making and social innovation (Rodríguez and Fuster Morell 2018), creating new ways of experimenting in policy co-creation (Mazzucato 2016). However, there is a general lack of studies analysing how specific approaches and methods can expand and apply diversity of perspectives and deepen societal actors' involvement in policy-making for the platform economy.

In this sense, our study analyses the methods and tools adopted for the co-creation process of public policy proposals between stakeholders regarding a Commons-oriented perspective on the platform economy in the city of Barcelona. We describe and analyse how the case articulated the productive collaboration of academic researchers, policy-makers in economy-related government departments, representatives of the platform economy at the local level and citizens as main actors of collaborative digital platforms.

2. Innovation and co-creation applied to public policies

In this section, we explain the relevance of co-creation in public policy-making not only regarding the phenomenon of platform economy, but also concerning the methodological implications when developing and analysing this case study. First, we present some general considerations, relevant advances and undeveloped approaches regarding emerging perspectives about co-creation and collaborative innovation in public policies. Afterwards, we describe the transversal importance of the conceptual framework of the Quadruple helix of social innovation (Carayannis and Campbell 2012). Finally, we focus on the platform economy context and address recent approaches surrounding policy innovation in the concrete case of the platform economy.

Various studies explore co-creation methodologies, particularly the connection between co-creation and social innovation when experimenting with new forms of citizen participation in policy-making and public management processes. Systematic reviews such as that of Voorverg et al. (2015) present a considerable variety of theoretical approaches and case studies on social innovation applied to the public domain. Based on 122 publications on the subject, the authors identified a wide diversity of conceptual and practical proposals for citizen involvement in policy-making. They also identified the lack of detailed analyses regarding results and collaboration processes around specific case studies. Other relevant approaches to social and public innovation address its counter-hegemonic nature and the crucial factor of governance, in that transparency and dynamic co-creation between stakeholders can also imply new power relations and institutionalisation dynamics (Pradel, Cabeza, and Anglada 2013).

Administrations are trying to integrate social innovation and co-creation using participatory design to collaboratively address complex policy issues, even though it is still an

emerging field of practice with all kinds of interpretations and institutional constraints (Lodato and DiSalvo 2018). Another relevant question to consider is how, in an ICT mediated society context, strategies for co-creating public policies should or could articulate practical, situated knowledge in parallel to dialogue mechanisms (Huybrechts, Benesch, and Geib 2017). However, such co-creation knowledge and mechanisms remain poorly described in the majority of literature when analysing formulas and processes to articulate more effective policy development and decision-taking mechanisms, contributing to transforming policy-making practices themselves (Woods, Fazey, and Hemment 2016).

In relation to effective policy innovation processes, authors including Kaaronen (2016) promote the idea of ‘science-policy interfaces’, based on inclusive processes that consider participant diversity and new forms of communication between stakeholders. However, this is an approach in which collaboration continues to prevail under a limited model, only connecting experts, academics and policymakers, and where the involvement of civil society does not usually take place at the same level. Other public sector innovation and policy-making studies focus on its evolving approach to design thinking (Mintrom and Luetjens 2016) and to ICT-influenced phenomena such as ‘policy labs’ (McGann, Blomkamp, and Lewis 2018), presenting examples of shared governance and ways of addressing social issues via participatory design methodologies. Despite a general claim for ‘user-centred’ perspectives and for methods such as ethnography, visualisation, and gamification in public policy co-creation, there is still little volume of studies describing the practical details of such processes, especially when providing an account about specific techniques and outputs derived from collaborations with citizens and other stakeholders.

In parallel to the aforementioned developments around co-creation and policy innovation, the theoretical framework of the ‘Quadruple helix of social innovation’ tries to connect the traditional silos between government, industry, academia and civil participants, and the importance of integrating their viewpoints to a shared context of collaboration (Carayannis and Campbell 2012). The quadruple helix framework is based on the previous one of the ‘Triple helix of the innovation economy’, which only considered the practices of government, university, and industry among its actors (Etzkowitz and Leydesdorff 1995). The quadruple helix perspective primarily represents a shift in considering how citizens can contribute to better knowledge and policy generation processes with the rest of the stakeholders, especially in relation to local and urban scales (MacGregor, Marques-Gou, and Simon-Villar 2010). Although the quadruple framework introduces civil society as a fourth fundamental pillar, emphasising the key role of citizens in bottom-up processes for solving common social challenges (Peris-Ortiz, 2016), it shares with other social innovation approaches a general lack of documentation and detailed analysis of co-creation and participatory policy design mechanisms (Fitzpatrick and Malmborg 2018).

On the other hand, different streams of design-oriented research stress the need to create policies under a common vision that generates clear social value, in a ‘new spirit’ of collaborative policy-making aware of the problematic of encroachment of Market logics and other complex appropriations (Kimbell and Bailey 2017). Zurbruggen and Lago (2014) highlight the importance of co-creating public policies towards the concept of the Commons, paying attention to core factors such as the mobilisation of a diversity of

actors and resources, deliberative and collaborative governance approaches, tangible and intangible results adding impact to social value. In this sense, the Commons has also been seen as an organisational metaphor for policy-making (Iaione 2016).

This Common-based approach has also been present in the specific case of platform economy. In this social and policy innovation context, a ‘Commons-oriented’ platform economy, based on collaborative governance structures and Commons principles, represents a coinciding alternative to the wider expansion of ‘platform capitalism’ (Srnicsek 2016), opposing from bottom-up approaches the ‘extractivist’ nature of the latter (Poderi 2019; Fuster Morell and Espelt 2019; Scholz 2016). This alternative ‘Commons’ or ‘cooperativist’ perspective of the platform economy represents an opportunity to rethink the public sector, especially for more public policy collaborative decision-making processes (Fuster Morell 2011). Despite initial interest in policy questions about legal disputes and controversies generated by the disruptive impact of the most well-known ‘extractive’ platforms, like Uber and Airbnb (Codagnone, Biagi, and Abadie 2016), little attention has been given to collaboration in the policy-making process apart from some exceptions (Light and Seravalli 2019).

There are several reasons to support the use of a policy innovation perspective in terms of the platform economy, as it affects and links to many policy areas which are challenging previous ways of working (Ranchordás 2015) and require a major plurality of competencies (Ganapati and Reddick 2018). This raises questions about what substantive policies to adopt and by whom, and how administrative functioning could take advantage of, and respond to, platform economy alternatives (Hong and Lee 2018), as well as its effects and potentials (Pais and Provasi 2015). Additionally, the innovative character of this type of economy in its different expressions, connected to practices of co-creation and to digital tools (Humphreys and Grayson 2008; Baseti et al., 2019) makes it a particularly suitable area for the deployment of collaborative approaches in policy-making, especially for opening up new streams of experimental policy innovation (Davidson and Infranca 2016).

3. Research questions

Through a case study situated in the context of the platform economy, we address how to apply co-creation for policy-making based on a quadruple helix framework perspective. We describe and analyse an integrative and iterative way to involve a diversity of participants from research, economical, public administration and civil society, beyond the mere *opinion setting* approach and general lack of ‘how-to’ perspectives found in literature. For this, our study and methodological approach were guided by two main research questions:

RQ1 – Diversity: How can co-creation, via participatory design methodologies, be applied to expand the diversity of perspectives in policy-making based on a quadruple helix perspective?

RQ2 – Participation: How can this type of collaborative approach contribute to deepening the participation of actors in the formulation as well as in the policy implementation process?

The dimensions of our analysis are: (1) who takes part and how during policy co-creation, also considering the governance structure at the city government level; (2) the

channels and methods adopted for the policy co-creation process (combining both offline and online spheres); and (3) an overview of the resulting public policies when deepening the level of involvement regarding how actors influenced the policy agenda setting and design, as well as its implementation.

4. Methodology

The methodology is based on participatory design, involving a selection of methods and approaches from different co-creation areas and practices. Our analysis departs from a three-year case study on how the coordination and facilitation of co-creation dynamics can contribute to the participatory definition of public policies for the Commons-oriented platform economy in the local context of Barcelona. Data were gathered between November 2015 and January 2019 using a diversity of methods (Table 1). Several participatory dynamics were applied to the production of shared knowledge, during work sessions with various stakeholders using mainly visual elements. This methodological commitment to participatory design was due to the general lack of replicable ‘recipes’ for policy co-design. The outcomes of the described experience, which resulted in 122 public policy proposals, were subsequently disseminated and enriched through digital channels and eventually implemented.

In relation to RQ1, participant observations were conducted first to obtain descriptive results via field notes and minutes from meetings and events. These events focused on the constitution process of the promoter group and its governance structure within the context of the platform economy in Barcelona (evolving from 15 initial members to more than 60 representatives of the sector during the mentioned period). Observations are a qualitative approach already used and established in co-creation and policy-making (Mintrom and Luetjens 2016).

Secondly, we applied participatory design as a ‘toolbox’ of methods within co-creation processes (Sanders 2002) and also as an iterative methodology of action research (Spinuzzi 2005). This was required in parallel for the collaborative development of new public policies and their evaluation through our study, guiding the co-creation process that led to concrete platform economy policy proposals. Such specific selection of methods, applied under an action research perspective, were: (1) SWOT analysis (Osita, Onyebuchi, and Nzekwe 2014); (2) the ‘theory of change’ technique (Chen and Rossi 1980); (3) collaborative writing (Garriga et al. 2018); (4) card sorting (Hanington and Martin 2012); and, (6) dot-voting (Senabre Hidalgo 2018). Another key rationale for this selection and combination of specific techniques, as analysed below in its adoption for policy co-creation, was to integrate existing methods from design thinking (Hanington and Martin 2012) to the quadruple helix theoretical framework.

For RQ2, we applied content analysis (White and Marsh 2006) on the co-created public policies after an online consultation process led by Barcelona City Council. The consultation framework focused on new policies for diverse areas of the city. This took place as an open, participatory public process between February and April 2016 (with nearly 40,000 registered users and more than 10,000 policy suggestions). Our study also addressed the 14 groups of specific platform economy policies implemented as a result of

Table 1. Dimensions of the study analysis on co-creation and methodological approach.

		Dimensions of analysis		Co-creation perspective		Research methods	
POLICY	CO-CREATION	RQ1 DIVERSITY	Shared governance structure	Quadruple helix of social innovation		Participant observation:	
						<ul style="list-style-type: none"> ● Fieldnotes ● Meetings and 'unconference'/lab participation 	
		RQ2 PARTICIPATION	Channels of co-creation and stakeholders interaction	Online and offline Commons-oriented collaboration		Participatory design:	
						<ul style="list-style-type: none"> ● SWOT analysis ● Theory of change ● Co-writing ● Card sorting ● Dot voting 	
			Deepness of involvement: agenda setting and implementation	Open consultation and collaborative-oriented policies		Content analysis:	
						<ul style="list-style-type: none"> ● Online consultation results ● City council accountability report 	

the co-creation process. For this, our method is also based on a content analysis of the accountability report of the department of the City Council responsible for its implementation, released in March 2019.

5. Results

The results of our study are presented following the interconnection of the two research questions. First, departing from RQ1, we analyse the diversity of actors involved regarding the governance structure and the constitution of the promoter group of the public policy co-creation initiative. We also describe the channels of participation adopted in the consequent participatory design process. In parallel and until the discussion section, we present results related to RQ2 concerning the level of involvement during the final digital participatory process and the implementation of derived policies in the Barcelona platform economy context.

5.1. Co-creation for embracing diversity in policy-making

5.1.1. Governance structure at different levels

The governance structure of the policy co-creation process led to four main components working autonomously (Figure 1): (1) an interdepartmental group at the City Council, coordinating the institutional view regarding the platform economy among the different departments involved; (2) BarCola, a working group between the Council and a diversity of actors of the local platform economy ecosystem; (3) Procomuns, an open forum focused on the policies in the mentioned area; (4) Decidim, a digital platform to engage Barcelona's citizens with different policy proposals.

The circumstances giving rise to the participatory design process configuring this case study departed from the initial need of Barcelona City Council to develop a diagnosis of

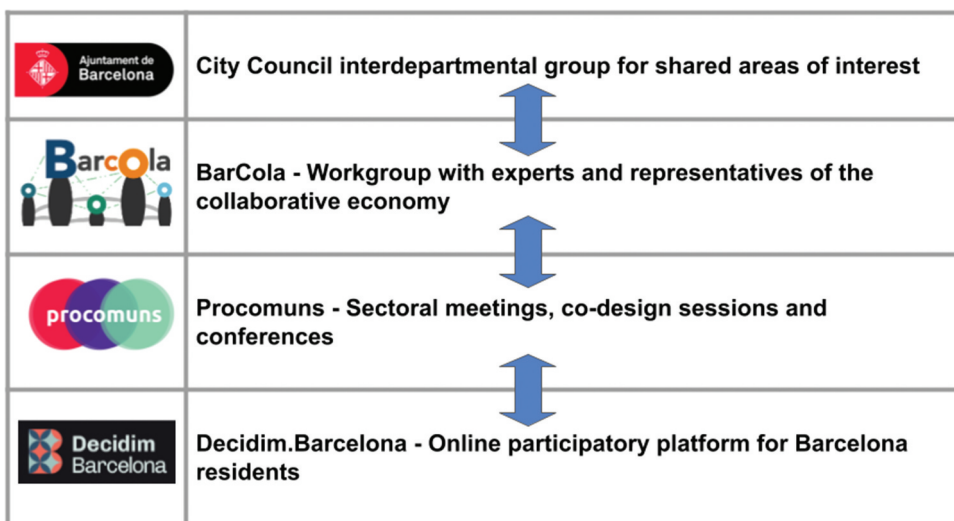


Figure 1. Overall case governance structure.

the platform economy and react to its impact on the city. This was in a context where the most corporate and extractive models of the platform economy (such as Airbnb or Uber) progressively generated public controversy and impacted on policy areas, such as access to housing and working conditions. Both locally and internationally, there was a lack of consensus about policy measures to regulate this type of activity. Instead of articulating a response in the shape of an expert report, for example, or to adopt classic consultation methodologies for possible diagnoses and solutions from an empiricist view, in the case of Barcelona, the answer was a co-creation framework: a collaboration with an action research group and the creation of a working group that could connect Barcelona City Council with the wider sectors in the city. This was intended, first, to identify challenges and opportunities surrounding the platform economy both in Barcelona and worldwide.

For this, in January 2016 the City Council conceived the creation of BarCola ('Barcelona Collaboration') as a joint initiative between the municipal administration and the Commons-oriented platform ecosystem of the city, with 15 representatives of the sector and key local agents. Its purpose was to study and promote more Commons-oriented models of the platform economy and make recommendations for the development of public policies. Academic research institutions, organisations from the platform economy, civic associations around the Commons and public bodies were invited members of this initial group.

5.1.2. Channels for the participatory design of public policies

6. From SWOT to collaborative writing: initial draft proposals

After the constitution of BarCola, a series of mechanisms and channels of co-creation were established following principles of participatory design and action research. A strategic analysis was completed among a group of representatives of the quadruple helix around the platform economy. This was implemented through an initial BarCola work session with 12 participants, evaluating the weaknesses, threats, strengths and opportunities of the platform economy in the Barcelona context, primarily using SWOT analysis methodology. For this, participants described a number of needs and potential improvements in relation to the state of the sector, often relating to public administration and its potential role, as well as key aspects derived from collaborative practices of open knowledge and the Commons (Fuster Morell 2018).

The challenges identified by this first analysis included potential negative impacts of main collaborative platforms, mainly on economic and professional sectors and some neighbourhoods; unfair competition between local and global initiatives; submerged economy circuits and non-taxation, *de facto* deregulation of certain activities, indirect labour costs, and the threat of multinational platforms with monopolistic power. This iteration led to considering how the platform economy in its most transformative dimension has a clear match with the societal and economic model that the City Council wanted to promote, based on more democratic and sustainable relationships and mechanisms (Blanco, Salazar, and Bianchi 2020): connecting technology and social innovation, promoting efficiency in idle pre-existing resources; generating knowledge open to all, as well as social empowerment of citizens not only as consumers but also co-producers.

Having co-identified the close link between economic, technological and political factors when addressing something as emergent and polyhedral as the platform economy, members of the working group collaboratively drafted an online document with potential approaches for new policies in the sector. This process was structured to openly collect proposals and specific policy measures that could guide the economic promotion activities of Barcelona City Council. Concurrently, this co-writing phase evolved with the need to establish a pre-eminent definition of criteria to clarify how factors of governance, transparency, impact or added value could be determinant for a more Commons-oriented platform economy.

7. Action research techniques for structuring and consolidating proposals

The following participatory design session adopted the action research method of ‘Theory of change’, to generate concrete proposals for long-term changes and defining steps to achieve them. This allowed for the co-definition of an additional set of policy proposals by imagining future possible scenarios in the platform economy and the Barcelona local context (Figure 2).

A priority in this phase of participatory generation of additional proposals was to establish a thematic clustering: once a list of sufficient measures was generated, the next co-creation session was guided by a card sorting technique, adopted from the field of knowledge management and user experience design (Figure 3). From the visual grouping of the 40 policy proposals generated, 8 broad policy areas emerged. These ranged from

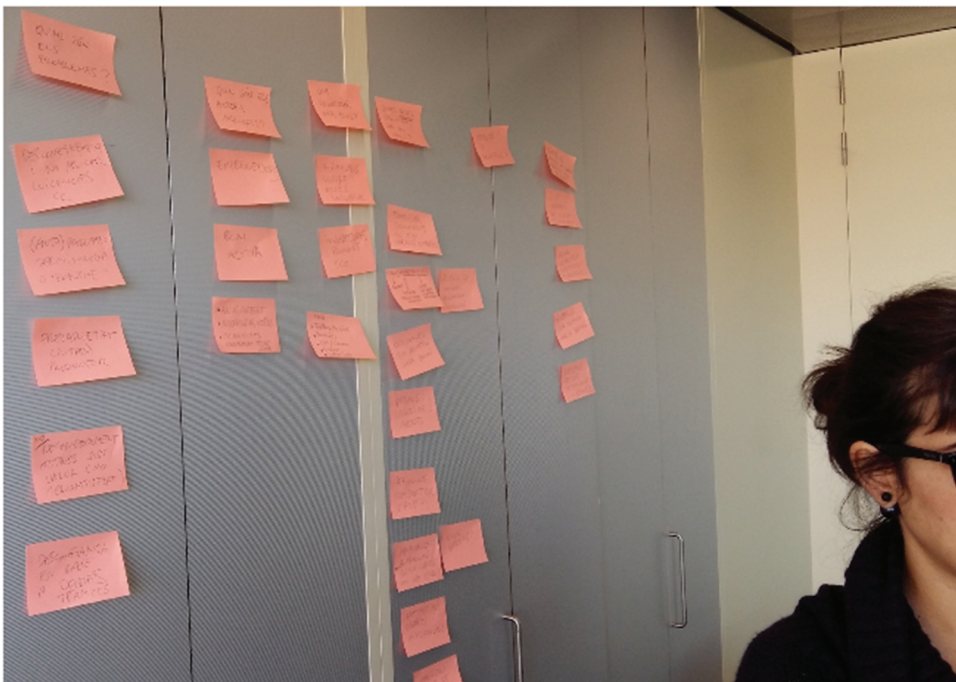


Figure 2. Sequence of policy proposals using the theory of change method.

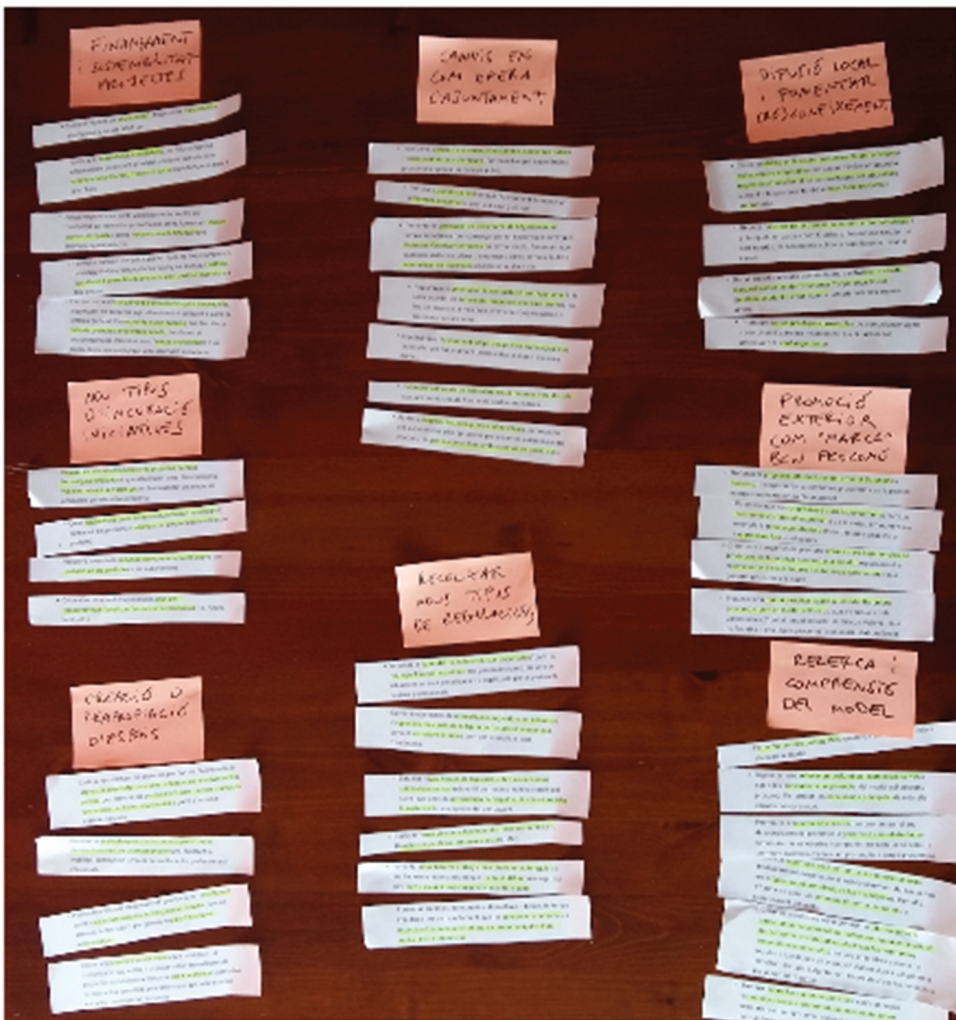


Figure 3. Clustering of initial policy proposals after the card sorting.

recommendations for the incubation of new projects to changes in the internal operation of the City Council with respect to the sector, to other related economic policies, and to the reuse of infrastructures and spaces.

8. The unconference format as a lab for public policy innovation

As a third participatory design phase, BarCola expanded the co-creation process by coordinating the use of Procomuns¹, a three-day thematic event on the platform economy and its policies. Procomuns was, in this sense, conceived as a quadruple helix meeting beyond the mere conference format, as a *lab space* (Zurbriggen and Lago 2014) or *temporary policy lab* (Kaaronen 2016). The event aimed to collaboratively generate and discuss proposals for new policies (among local initiatives and relevant

actors in the city, international experts, political leaders and civil society) to address issues related to the platform economy in a wide transversal way.

The distributed ‘unconferencing’ process of Procomuns, following the inspiration of unconference formats (Budd et al. 2015), was key to the participatory design of public policies in this instance. The programme and activities covered different platform economy sub-themes: general regulatory measures, technological developments, tourism, social inclusion and job conditions, amongst others. These discussion topics and potential policy proposals allowed relevant experts, users and platform leaders, as well as entrepreneurs from diverse fields, to contribute with their knowledge and expertise. Orienting the different sessions thematically generated discussions on the drafted policies (mainly by means of questions agreed previously with the moderators of each panel), as well as specific workshops to suggest new measures. This expanded sequence of guided collaborative writing also required a strategy of real-time distributed documentation and taking notes in parallel about what was discussed. As such, Procomuns adopted the tool of a real-time text editor (PAD)² in collaboration with volunteers and content coordination from the online documentation project Teixidora (Garriga et al. 2018). The collaborative note-taking process (Figure 4) allowed for the documentation of an additional 60 new policy recommendations.

Seen as an additional *science-policy interface* for distributed feedback when generating new proposals during the Procomuns unconference, a display based on basic principles of design thinking (Sanders and Simons 2009) was placed on whiteboards.

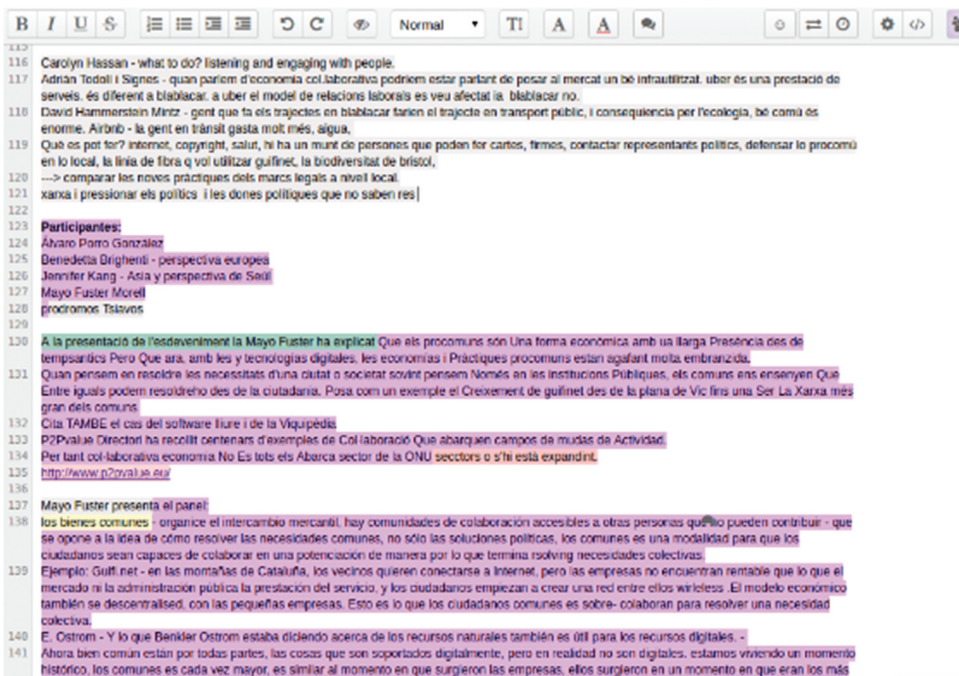


Figure 4. One of the collaborative writing PADs to document new proposals.

Participants could read the generated policy proposals and show their support by dot-voting those they considered most important or relevant (Figure 5). Another white-board allowed for commenting on new measures, representing an additional source that was integrated into the first version of the policy recommendations document when published publicly online.

8.1. Deepening collaboration in policy design and implementation

8.1.1. Involvement in agenda-setting: impact of policy proposals on PAM process

As a fourth phase, the list of public policy proposals was uploaded, voted and discussed online. This coincided with the broader public consultation process to define Barcelona's Municipal Action Plan (PAM) via the Decidim online platform (Aragón et al. 2017). Barcelona's PAM³ was a temporary process for city residents to define the long-term Municipal Action Plan (Pla d'Actuació Municipal, PAM), taking place as a digital consultation during the first half of 2016. The main channel for this municipal 'roadmap' was the Decidim online platform, which since 2015 has been Barcelona's digital infrastructure for participatory democracy. This open-source platform allows the public to directly participate in government decisions, following specific open consultations and direct voting. The PAM process on Decidim, beyond hosting several offline events that gained more than 40,000 registered individual users and 1,500 organisations, contributed to more than 10,000 policy suggestions on a variety of city-related topics and issues.

By conducting a basic content analysis of the PAM consultation outcomes, after incorporating the measures that emerged from the Procomuns discussions, documentation and co-creation activities (with the participation of more than 400 representatives in total), 122 platform economy policy proposals were finally shared, discussed and voted online via Decidim. The Decidim platform, used widely by communities and



Figure 5. Participants supporting different policy proposals.

stakeholders for the Barcelona PAM, not only represented another format of online documentation, giving additional visibility to Procomuns outputs via social networks, but also provided additional refinement and social filtering of the co-creation outcomes, generating additional interactions and discussion.

Throughout the whole PAM process, more than 10,000 proposals collected received a total of 165,087 support samples and 18,161 comments. Among the proposals, 42% were carried out at the city level and 58% at the district sub-levels. As a result of the PAM online process, 87 out of the 122 suggested policies and measures were finally accepted to be considered by the City Council for implementation in the following three years (Figure 6).⁴ This represented 71% of acceptance, far beyond the average 42% of acceptance and implementation of PAM proposals.

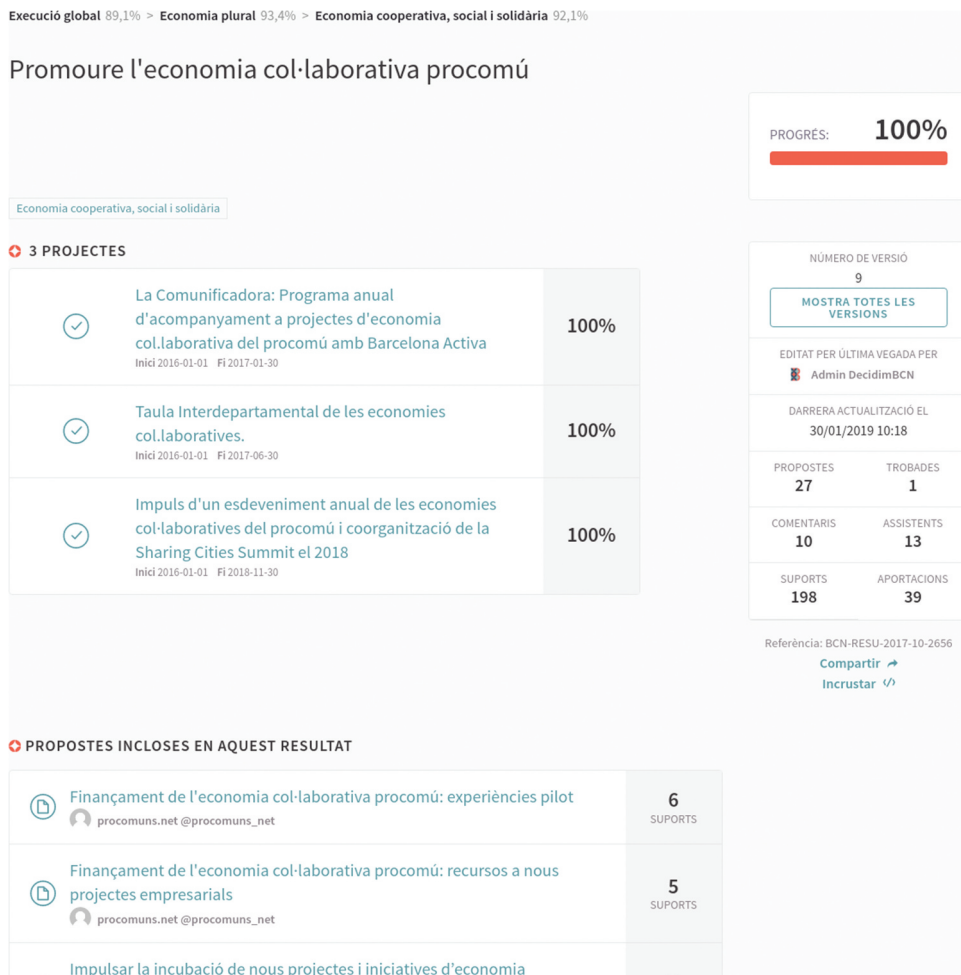


Figure 6. Example of procomuns proposals on decidim related to specific city council approved projects.

If we consider the volume of proposals generated during more than 400 meetings linked to PAM, the co-created policy proposals of this case study also had a significant impact: they represent the third group with more defined proposals through the entire PAM process (only surpassed by the number of proposals generated in two other policy areas: education and elderly people).

8.1.2. Final policy implementation and collaborative characteristics of public policies

9. Overall implementation of policies

Due to the open content of a final accountability report by the Commissioner of Social Economy, Social Development and Consumption of Barcelona City Council in 2019, it is possible to assess the implementation results of the Procomuns public policies. This report specifies 14 areas connected to the 87 co-created policy measures finally accepted via the Decidim platform, taking place with different levels of implementation from 2016 to 2019:

- (1) Development of a common narrative ahead of the platform economy and the positioning lines of the City Council, as well as a global reference, by the creation of an interdepartmental working group (2 meetings, 10 areas).
- (2) Consolidation of BarCola as an expert-based networking node around significant experiences of the sector in the city (after three years, 50 representatives participating, with 30 projects, and 4 departmental areas of the City Council).
- (3) Three editions of an intensive incubation program for the promotion of 45 new Barcelona-based projects for the Commons-oriented platform economy: 'La Comunicadora'.
- (4) Annual meeting of the 'Procomuns forum Platform economy: Policies, technologies and city for a people's economy' (two editions, in 2016 and 2017, and afterwards 'Sharing Cities Action' in 2018 and 2019).
- (5) Support for the international event Ouishare Fest Barcelona and other digital platform-related events in Barcelona.
- (6) Diagnostic study of the platform economy sector and strategic lines for Barcelona City Council.
- (7) Directory map of cases in Barcelona and Catalonia, with the identification and geolocation of 1,400 cases.
- (8) Interventions on the subject at the events Mobile World Congress, Smart City, and coordination of international presence via a Sharing Cities Summit in Barcelona.
- (9) Definition of Guifnet WiFi and Internet digital divide project with the Municipal Computer Institute (5 pilot projects).
- (10) New funding grants for digital social innovation and neighbourhood-based projects at the local level (4 editions).
- (11) Experimentation with basic income pilots (B-Mincome project) and economic collaboration through local currencies.
- (12) Match-funding pilot for platform economy projects and new initiatives in Barcelona, via the Goteo crowdfunding platform.

- (13) Circular Economy – eReuse Program: Reuse of computers and collaborative uses of public administration infrastructures for sustainability.
- (14) Grants for the promotion of open technology and digital manufacturing, as well as new forms of innovation and collaboration for social challenges and sustainability in neighbourhoods.

At a methodological level and in the longer term (and in relation to the measures in point 8), the action research strategy of Barcelona described in this study has also resulted in a new policy innovation format at the international level since 2019. This has engaged more than 60 global cities for co-designing platform economy policies under the Sharing Cities Action initiative (<https://www.sharingcitiesaction.net/>).

10. Discussion

This study focuses on the applicability of new methodological approaches when defining public policies. It departs from an action research perspective, amidst rapid social changes derived from ICT, and in connection with the challenges and opportunities of the platform economy at the local level (Pais and Provasi 2015). We show how existing co-creation and participatory design methodologies can be applied to this still-emerging public policy innovation field. The driving question of how co-creation can contribute to increase diversity and deepen the participation of actors in collaboration-based policy-making was addressed through a three-year case study on the platform economy in Barcelona. We have described how co-creation dynamics contributed to the collaborative definition of public policies and agenda in the local context of Barcelona. Results set out in detail how co-creation can increase diversity aligning academic, economic, and social viewpoints in policy innovation from a quadruple helix perspective. This policy ideation and development process resulted in 87 concrete policy measures through distributed contributions from more than 300 total participants.

In a context of novelty and bewilderment of public administrations when regulating and promoting the platform economy (Hong and Lee 2018), our experimental intervention demonstrates the importance of addressing the diversity of actors and participants in the generation of new policies in this field. In this sense, we consider the key importance of detailing and taking into account how participatory design can provide channels and mechanisms as an iterative process. Our analysis describes how co-creation methods can apply to policy-making and its implications for participation. We consider that our experience shows the value of a cycle of collaboration through co-creation going beyond mere symbolic engagement or citizen support to public policy-making (Allegretti, Secchi, and Tang 2016). Thus, reaching remarkable results of decision-making on policy agenda by integrating a plurality of voices around the platform economy, as also suggested but not always described in detail by previous studies (Light and Seravalli 2019).

Specifically, our study describes a way of orchestrating co-creation and identifying which channels to articulate a policy-making governance structure based on participatory design principles and techniques, both online and offline. In light of the number and diversity of public policies derived from the co-creation process described, open collaboration approaches seem key when addressing effective public policy-making innovations, in line with other studies (Kimbell and Bailey 2017; Popper et al. 2017). Our

findings also suggest that activating both co-creation and action research approaches to economy-related policies can constitute a useful strategy for the harmonisation of different points of view and experiences, especially in a field where business models and social impacts evolve constantly as opposed to the slower rhythms of public administration. This can be possible by following a participatory design incremental process to generate ideas, discussion and selection of proposals in a participatory manner. This opens up the role of public administration through the integrated intervention of experts both as academics and practitioners, as well as the involvement of civil society beyond a mere perspective of 'voters' or 'users' (Kaethler, De Blust, and Devos 2017).

Some of our results coincide with previous literature including case studies in which participation for innovation at the level of public policies is channelled through co-creation tools and spaces (Spada and Allegretti 2017). The present case study evidences the importance of combining co-creation with 'classical' techniques of action research, strategic planning or knowledge management, as well as with online mechanisms such as collaborative writing via pads, and consultation platforms like Decidim, to achieve deeper levels of collaboration between civil society and the public sector (Woods, Fazey, and Hemment 2016; Huybrechts, Benesch, and Geib 2017). This combination can facilitate a scaling up of the process from solid bases of 'minimum viable' proposals, generated in previous face-to-face participatory design dynamics, towards the online integration of diversity with as many points of view as possible. Our case study can also assist in producing reliable and verifiable validation mechanisms for guiding the public administrations responsible for implementing proposals more transparently (Bovaird 2007).

In terms of how this type of participatory approach can contribute to deepening the participation of actors in the policy implementation process, our results indicate that from the Procomuns offline format to the Decidim online one, public policy co-creation is not only possible and viable but can also result in a significant improvement in the quality and quantity of proposals. Here we must highlight how the Barcelona PAM online consultation through Decidim shows a significant presence and acceptance of the proposals derived from Procomuns, being among the first three with more corpus of measures endorsed among a total of 400 similar face-to-face meetings. This stresses the important aspect described in relation to the Procomuns unconference as a participatory forum, channelling and intensifying participation through transversal co-creation events and parallel detailed documentation, following the spirit of 'public sector innovation labs' (McGann, Blomkamp, and Lewis 2018). Our approach suggests the useful modification of obsolete mechanics of policy-oriented congresses and conferences, in this case appropriating and adapting methods of deliberation through collaborative events as a proof of concept of science-policy interfaces (Sarkki et al. 2015). It is also important to emphasise the fact that all the public policies described have a strong collaborative character in essence, such as La Comunicadora peer-to-peer incubation program or the Goteo open match-funding process (Fuster Morell 2018).

One of the issues to consider for future research is how participatory methodologies for policy-making can work in contexts other than the platform economy. Some of the methods adopted and results obtained can be applied in areas where it is easy to identify the different representatives of the quadruple helix ecosystem, as well as a lack of institutional constraints (Lodato and DiSalvo 2018). Besides, a determining factor may be the degree of familiarity from participants with digital tools and participatory

processes, since diverse voices and perspectives should be considered in this kind of policy innovation approach (Spada and Allegretti 2017). Clearly, also more comparative approximations of how different areas of public administration respond to similar processes would be needed, both in relation to the participatory methodologies they adopt and the outputs they generate. New experiences in similar contexts can help to better understand the role of other types of participatory design methods for co-creation in public policy, via experimental case studies that address the role of different agents, as well as more qualitative analyses such as ethnographies that deepen the experience and perceptions of participants.

Overall, by connecting relatively unexplored frameworks like the quadruple helix of social innovation with concrete co-creation methods and materials, and integrated as an action research cycle, our findings support the idea that the collaborative dimension of the platform economy, as well as the characteristics of participatory design, can have a transversal influence in the way public policies are co-defined and implemented, generating policy innovations based on a structured and multi-channel collaboration. We further highlight the importance of dynamically and progressively involving a diversity of stakeholders, as well as the convenience of combining online and offline channels for this type of co-created policy-making. Finally, we consider that the action research approach to the participatory design of public policies contributes to a promising field of experimentation for new ways to allow citizen and institutional collaboration in more dynamic and effective ways.

Notes

1. See <http://procomuns.net/>
2. See <https://etherpad.org/>
3. See: <https://www.decidim.barcelona/processes/pam>
4. Source: <https://www.decidim.barcelona/processes/pam/f/11/meetings/322>

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