The Shape of Bottom-Up Urbanism Participatory Platforms: A Conceptualisation and Empirical Study

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THE SHAPE OF BOTTOM-UP URBANISM PARTICIPATORY PLATFORMS: A CONCEPTUALISATION AND EMPIRICAL STUDY

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Abstract Citizens around the world are changing their urban environment through bottom-up projects. They are increasingly using digital platforms to come together. From the perspective of smart city research, this form of participation and interaction with city administrations has not yet been researched and defined. In our study we suggest a conceptualisation of bottom-up urbanism participatory platforms and analysed 143 platforms. We identified 23 platforms as our study sample. They vary in their focus from implementation to funding or discussion. Therefor we found a broad range of participation mechanisms. A wide range of employment or voluntary work of staff members was shown. A heterogeneous picture also emerged regarding other characteristics (e.g. funding size, users or number of projects). One thing they have in common is their good cooperation with cities and regional actors.

1   Introduction

In the notion of smart city initiatives local governments have an increasing interest in more citizen-centric approaches for future cities (Cardullo & Kitchin, 2019). They form "smart", new ways to tackle the challenges of the future. Those lay within the facets of economy, people, governance, mobility, environment and living (Lombardi, Giordano, Farouh, & Yousef, 2012). In order to adapt, local governments evolve with a growing importance for new governance strategies where the cities reflect their processes and role understanding. Gil-Garcia et al. (2020) address how governments of smart cities interact with their citizens and identify the dimensions of information availability, transparency, participation, collaboration and information technologies. Through participation the local governments perspective changes as does the citizens perspective. In Foth's (2017) Cities 4.0 concept the governments change from administrator to collaborator and citizens from residents to co-creators. From this point of view we see a collaborative approach with both partners meeting in a new "middle". It is a shift from designing for the citizens to giving them the right to change or even reinvent their urban environment.

Under the umbrella term of bottom-up urbanism citizens revive an unused building into a community cinema, organize street festivals or transform a fridge into a book-sharing shelve. Those and other activities are carried out by citizens from Detroit to Paris and from Christchurch to Vienna. Those initiatives are seen as a driver for urban innovation (Caragliu, Del Bo, & Nijkamp, 2011) by building an experimental environment (Anttiroiko, 2016). In this environment the cities can adapt through the actions of citizens in response of ongoing changes in society (Silva, 2016).

Since bottom-up urbanism is seen as an alternative to the top-down approach of planned environments (de Waal & de Lange, 2019) the role of city planners is changing: where planners previously developed projects for urban space, now the development of digital platforms for the engagement of the citizens is becoming a central task (Ertiö & Bhagwatwar, 2017). Those platforms differ in their functionalities (e.g. post ideas, discuss topics) and offer a broad range of participation levels (Falco & Kleinhans, 2018). Senbel & Church (2011) proposed a broadly used concept to distinguish participation levels on digital platforms.

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Participation on the lowest level in this regard can be seen as simply being provided with information. The middle layers of the model by Senbel & Church (2011) allow citizens to participate by contribution of ideas and by getting inspiration for instance by using polls or inviting citizens directly for their opinions on a certain issue. The higher levels finally allow citizens to join the planning and design process along with the possibility of creating their own neighbourhood plans. However, the model misses citizen control (highest level) as proposed by Arnstein (1969), which is described as self-governance in smart city research (Zhilin, Klievink, & de Jong, 2019).

The lower, middle and higher level had been broadly researched (Desouza & Bhagwatwar, 2014; Ertiö & Bhagwatwar, 2017; Falco & Kleinhans, 2018; Gün, Demir, & Pak, 2019) but the implementation of platforms supporting higher levels of participation did not fulfil the users needs yet, as reported by empirical studies (Gün, Demir, & Pak, 2019). Mostly because the engaging mechanisms have not yet developed (Ertiö, 2015) and practitioners often fail to further improve and provide the funding for their platforms (Abel, Stuwe, & Robra-Bissantz, 2019). That leads us to the demand to further investigate and understand platforms of the highest level of participation with a focus on platforms supporting citizen projects. Researchers distinguish the importance of self-governance as a part of the broad concept of smart cities (Zhilin et al., 2019), which will be discussed in section 2.1 in detail. However, there is a lack of concrete concepts regarding self-governance in this context and the differentiation towards other concepts remains unclear (Rauws, 2016). That causes planners and cities to undervalue self-governance. The outcome of this study focuses on the research question:

How are bottom-up urbanism participatory platforms conceptualized?

In part A of this paper we derive a definition of bottom-up urbanism participatory platforms. Which, in part B, is evaluated in the field by analyzing 143 platforms. We then provide a detailed view on 26 platforms identified as bottom-up urbanism participatory platforms.

2   Conceptualisation

The percentage of people living in cities is growing and growing (Statista, 2020). Hence it is necessary to think about the future of cities which should be built to fulfill citizens needs and enable them to participate in their environment. In smart city concepts Gil-Garcia et al. (2020) identified interaction dimensions and Nam & Pardo (2011) offer three main components that seem to be at the core of it: technology factors, human factors and institutional factors. The connection and interplay of those factors is where investment into smart cities enhances quality of life and provides sustainable growth (Caragliu et al., 2011).

Zhilin et al. (2019) sees smart cities as an onion where the layers are connected and build apon each other. In our conceptualisation of bottom-up urbanism participatory platforms we are going to describe those layers in the following sections and bring them together in form of a definition in the last section (2.5).

2.1   Future cities and the public discourse

Future cities are often discussed as smart cities in the public and academic discourse. Oftentimes the definition is limited to technical solutionism like the smart city being a collection of services and the consumption of internet technologies (Walser & Haller, 2016). This focus is also described as the "Control Room" vision of a smart city where the focus of a city is laid on central optimization and the city as a service (de Waal & Dignum, 2017). However, the result of this de-subjectivism of citizens most likely leads to less participation because the only role for citizens is to be data provider for companies selling technology-centered smart city solutions (Keymolen & Voorwinden, 2020).

De Waal & Dignum (2017) also envision "Smart Citizens". The latter being a counter-argument regarding the Control Room vision described before. In it, citizens and civic organizations use digital technologies to mobilize themself, act together and claim self-governance (de Waal & Dignum, 2017). Additionally, the municipality uses digital technologies to optimize their citizen centered processes but is still the main regulator in the city. On the one hand we have citizen engagement (e.g. bottom-up urbanism) and on the other hand the municipality setting the legislative frame.

The concept of smart cities differs from concrete to vague ideas and can be better understood as "urban imaginaries" with a set of "visions, hopes, and fears – rational or irrational, fact based or emotionally appealing" (de Waal, 2011). Rather than having a clear agenda to reach a specific "what", smart cities evolve as "working arrangements" (Cowley, Joss, & Dayot, 2018) with multiple processes that need to be under constant evaluation and adapted if needed. A smart city is better seen as discourse with constant change that "may become the new 'normal'" and lead to "new rules and routines, in laws, in new business models, in new roles for actors, and even in newly shared values" (Hajer, 2016). However, this requires the realization of concrete projects rather than vague discussions of possibilities (Schinkel, Jain, & Schröder, 2014). In this regard, citizens all over the world already find new ways to take part in the discourse and prototype their understating of future by changing their surroundings.

2.2 Participation: When citizens really take their part

With Arnstein's (1969) Ladder of Participation a formulation to more power in urban planning for citizens began. She imagined a society that is more equal and saw the path to success by participating and transfering power to the citizens (Cardullo & Kitchin, 2019). At the same time Lefebvre (1968) criticized the development of cities with capitalism interests under control of the government and proclaimed the "right to the city" as a self-determined space for citizens.

In the notion of smart cities the self-determined space shifted towards the question of governance or who has to decide? Decision-making is traditionally lying in the hand of public actors but it is debated how a policy process is organised and how non-governmental actors such as citizens are involved.

Kooiman (2003) structures governance modes in hierarchical governance, self-governance and co-governance. The mode self-governance sets the non-governmental actors in the center and the government to the side. It can be divided in terms of actors, powers and rules (Arnouts, van der Zouwen, & Arts, 2012).

The Actors are citizens that actively participate to achieve a common goal, have the power in decision making and the form of internal coordination they choose (Zhilin et al., 2019). They operate in a high degree of freedom but are guided by rules of their own and by the government.

Acting within this mode of self-governance the individual intentions are transformed into a collective intent (Rauws, 2016). This transformation can be better seen as an ongoing process than a status quo. As the actors question and transform the urban environment the shape of the governance system itself is always questioned and iterated by non-governmental actors and the government.

Where Zhilin et al. (2019) sees self-governance as a top-down approach where the government empowers citizens, we argue that self-governance can as well arise from the bottom-up as a demand of the right to the city. It is emerging as an interplay from top-down and bottom-up approaches where both sides reimage their rules and roles on their way to a more equal future city.

2.3   Acting on the streets from the bottom-up towards big change

In recent years bottom-up urbanism became the umbrella term (Douglas, 2019) for several views of the transformation of the public space by citizens (Fabian & Samson, 2016). The focus of "bottom-up" represents the origin of the initiatives within the citizenry and the mode of self-governance of the actors (Kickert & Arefi, 2019).

The activities of citizens to transform the public space symbolise the difference between the city as a planned environment and as a lived place (Crawford, 2008). Citizens aim to solve unadressed problems (Finn, 2014) in a way of incremental improvements at smaller scale (Talen, 2015). In a do-it-yourself (DIY) manner they build projects and are seen as amateur designers which delimits their actions from planned urbanism (Iveson, 2013).

The outcome of those projects are very different and we find no project like another. They inhabit several perspectives and vary in their goals (Kickert & Arefi, 2019). That offers a contribution to the public discourse and planning processes. Since bottom-up urbanism is "a radical repositioning of the designer, a shifting of power

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from the professional expert to the ordinary person" (Crawford, 2008) there are opportunities for planners to learn from citizen's projects. This contribution is inhabitant in the perspective of Tactical Urbanism with its mantra "short-term action for long-term change" (Lydon & Garcia, 2015). It is seen as a way to provide new insights of citizens through their activities and clarify the meanings by providing physical evidence (Silva, 2016). Even though their concrete projects are often of temporary nature. But like the transformation of parking lots with immediate results and the scope towards bigger change, it is the mentality to prototype an object which is transformed and tested while used to become a symbol for a future vision. A vision not of a concrete spatial situation but an opening for like-minded ideas.

2.4   Urban participation on participatory platforms

As shown before we have a good understanding of the governance mode and the activities of bottom-up urbanism. There has been serveral studies that show the usage of technology in participatory processes (Desouza & Bhagwatwar, 2014; Ertiö & Bhagwatwar, 2017; Falco & Kleinhans, 2018; Gün et al., 2019; Senbel & Church, 2011). But there has been no focus on the self-governance level on participatory platforms. In their work Desouza & Bhagwatwar (2014) studied 38 platforms of the biggest cities in the U.S. to reveal different archetypes in the lower (consultation, placatation) and higher level (partnership) of Arnstein's Ladder. Gün et al. (2019) analysed 25 platforms with only three platforms in the highest level of participation (e.g. self-goverance). Falco & Kleinhans (2018) provide a broad overview with 113 platforms and find 11 self- goverance platforms but not all of them in a public interest context. All of those empirical studies show a current status of all levels of participation on technology-enabled platforms and help to shape the understanding of the differences between the levels but did not specify the level of self-governance. This broad field in the full range of participation levels is more and more getting into the focus of researchers. And so are the definitions of participatory platforms in general: There are different types in the manner of levels of participation and the intensity of the actors' involvement (Falco & Kleinhans, 2018). Those actors are all individuals and organizations who interact with the city, e.g the residents, activists, public agencies, non-governmental organizations, businesses (Desouza & Bhagwatwar, 2014). A participatory platform has specific goals within its purpose and offers a range of attractors or functionalities to enable participation (e.g. information distribution, group organisation or idea voting) or data collection (e.g.

tracking apps). Those come in different mediums that differ in online and offline (Desouza & Bhagwatwar, 2014).

2.5   Definition

As shown in the sections before there are several views that led us to the concept of bottom-up urbanism platforms. To describe it with the onion metaphor of Zhilin et al. (2019) we believe that the layers of our concepts are interweaved into each other. With a closer look and the perspective of Nam & Pardo (2011) and the dimensions of Gil-Garcia et al. (2020) we see all components addressed.

The technology factor (or information technology) in form of a participatory platform is working as an enabler of participation, offers information availabilty and shows progress in a transparent manner and acts as a supportive structure for the other components. The human factors are covered in our concept through the focus on the citizens as the actors (from the bottom-up and DIY) and the transfer of power towards them or annexation of rights by them (self-governance) which is directly linked to the institutional factors as well. And we see contribution to the discourse of future cities, first, provided by the platform as a new governance system in constant development and, second, by the outcome in form of projects. Within the institutional factors our concept should be seen as a collaborative approach of cities and citizens. To merge the sections before we offer the following definition:

Bottom-up Urbanism platforms focus on providing power to the actors of cities. They are specific playgrounds of self-governance guided by rules where citizens propose, develop and implement their projects. The citizens and civic organizations build urban interventions as small scale and short-term solutions to address specific problems. This offers a tangible contribution to the ongoing discourse of future cities and a new mode how we want to shape the future of our cities. The main components of these platforms are online mechanisms providing participation through different levels (e.g. start a project, crowdfunding) to involve a broader part of the citizenry and offline components (e.g. workshops, local funding) to complement and enhance digital mechanisms.

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3   Methodology & study design

This study is divided into two parts. Part A, is dedicated to the question how a coherent conceptual definition can be developed from previous research contributions. Based on a systematic literature review, the described conceptualizations were realized by integrating different concepts and approaches.

Part B, includes the construction of a database of existing participation platforms, the development of a qualitative research design, as well as their subsequent evaluation and selection. Several different steps were performed in Part B.

Step 1 includes a second systematic literature review, a questioning of experts and a detailed internet research, which identified a total of 143 established participation platforms.

In step 2, the focus was to identify participation platforms that provide their users with the highest level of participation, the analysis was assessed by two independent raters. Using the conceptualization and the information publicly available on the platforms, the following questions had to be answered positive:

Does the platform provide functions that enable citizens to create their own projects for the public space? Does the platform empower citizens to implement these projects? Were most of the projects realized by the citizens themselves?
Only the platforms that met these criteria were included in the further analysis, which reduced the sample to 26 participation platforms.

Table 1: Sample table

Platform name			
Co-citoyens	Ecocrowd	Gapfiller	Gut für Nürnberg
Hannover machen	Ioby	Moveforhunger	Open Berlin
Place2help	**Patronicity***	**Platzprojekt***	**Raumpioniere***
Rabryka*	Schützenplatz	**Sandkasten***	Startnext
Spacehive	Sagerdersamler	Urbaneoasen	Urbangreenewcastel
Voorjebuurt*	Wechange	**Yooweedoo***	

Source: own elaboration; *completed the questionnaire

In step 3, the relevant characteristics of the participation platforms have been defined. In consideration of the existing variability, we selected only those categories, which reflect the most widespread similarities and differences (e.g. number of active users or focus of participation). The data was collected primarily from the main websites of the platforms, and less frequently from secondary sources (e.g. Internet archive – "wayback machine"). If important platform components have changed over time, the current information was used and earlier changes were not taken into account. Platforms not active anymore were not taken into account and reduced the study sample to 23 platforms which are listed in Table 1.

In step 4, a questionnaire was sent to the platform operators. A total of seven platforms completed the questionnaire, which corresponds to an average response rate of 33%. Two platform operators rejected a participation and 12 didn't response to our request. In addition to our previously data collection, the questionnaire included a query of non-free-access information related to organizational structure (e.g. funding, personnel). The analysis of this data was performed purely descriptively to gain an initial impression of the characteristics of existing participation platforms.

4   Results

The results are divided into two parts. The first section (A) presents the integrated results of the descriptive analysis of studied participation platforms. The second section (B) reports the results of the qualitative questionnaire survey.

First, it is important to describe relevant distinguishing dimensions for the analysed platforms ($n = 23$). As a recent phenomenon, the digital participation platforms within this sample were founded between 2009 and 2019. In fact, $n = 2$ (8.70%) platforms (Open Berlin, 2017; Place2help, 2020) are not active or going to be terminated. In addition, $n = 2$ (8.70%) platforms (Urbaneoasen, 2020; Gapfiller, 2019) were conceptually transformed into non-participatory platforms. The average duration of activity (cut-off date: 12/31/2020) comes to $M = 6.74$ ($SD = 3.55$) years.

An important component of any digital participation platform is the number of participation options, referred in the following as participation mechanisms. One can distinguish between 9 various mechanisms, depending on the depth of participation: Information, Like, Follow, Comment, Share, Crowdfunding, (Offline) Participation/Assistance, Join and Start Own Project. On average, platforms provided multiple mechanisms to their users ($M = 5.17, SD = 1.99$). Considering the participation focus, three relevant main priorities could be identified. Thus, 8 platforms focused on the implementation of projects (37.78%), 4 platforms focused on discussion (17.39%) and 11 platforms focused on funding (47.83%). In terms of projects, an average of $M = 137.13$ ($Mdn = 37.00$) were initiated per year, although the number varied widely ($SD = 231.01, IQR = 134$). A total of 16 platforms (69.57%) support their users through professional support services (e.g., coaching; [self-] learning). The degree of networking varies within the sample ($n = 22$), averaging $M = 29.86$ ($SD = 30.57$) network partners. One platform ($n = 1$) was excluded from the network analysis due to lack of available data.

Second, to make the results more precise, data collection was carried out in the form of a self-developed questionnaire. A total of $n = 21$ platforms were surveyed, with a response rate of 33.33% ($n = 7$). Individual data points were missing. The exact sample size was reported in such cases. The questionnaire was rated ($n = 6$) on a scale of 1 ("Very poor") to 10 ("Very good") as good ($M = 7.33, SD = .82$). In the following, superordinate characteristics are presented first. Secondly, the qualitative results are reported separately by platform.

The participation platforms have an average of $M = 4.57$ ($SD = 3.82$) employees and $M = 20.92$ ($SD = 39.47$) other persons, e.g., voluntaries ($n = 6$). On average, $M = 631$ ($Mdn = 489$) projects were launched. The number of projects varied widely ($SD = 682; IQR = 863$). An average of $M = 544$ ($Mdn = 228$) were successfully implemented ($SD = 679; IQR = 776$). Regarding the analyses of all projects, the Rabryka platform indicated only a reference frame of the calendar year 2019. The number of makers ($M = 903, Mdn = 400$) varied widely ($SD = 987, IQR = 1730$). The average number of network partners is $M = 48$ ($SD = 39$). On a scale of 1 ("Very poor") to 10 ("Very good"), the willingness of public partners to cooperate ($M = 7.86, SD = 1.95$) as well as the

collaboration with regional actors ($n = 6, M = 8.00, SD = 2.10$) were rated as high.

5   Discussion and Conclusion

Our main contribution is the comprehensive conceptualization through the integration of existing research to promote the understanding of the functioning of bottom-up urbanism participatory platforms. In addition, an adequate description of the population is given. That leads to a fundation for future research and the identification of relevant topics for the practical domain.

With regard to the population, the heterogeneity of the digital participation platforms was particularly evident. Above all, this made it difficult to compare the platforms. For example, the number of projects in the sense of "food donation campaign" from Moveforhunger can only be compared with difficulty with the "installation of containers" for initiatives from the Platzprojekt. In the future, fundamental conceptual differences within the platforms should lead to the distinction between different subpopulations.

In our study, we examined platforms that were well funded and were able to retain several employees. But also platforms that have given up or turned away from a participatory concept. Platforms which offer crowdfunding seem to have a more solid business model but there are no clear indications to break it down to that point. We found innovative participation approaches e.g. the combination of crowdfunding for citizens and institutional funding as match funding from Patronicity or a mixed campaign to provide funds, helping hands, expert knowledge and material donations from Raumpioniere.

Future research should not only examine the view of the platforms and their founders but also the citizens themselves, the city government and other stakeholders to provide implications for business models and for platform design. A further point is the question of which participation mechanisms in practice exert the most influence on the participation experienced. It is also important to question whether more participation mechanisms automatically mean a positive effect.

In the broader context of smart cities we shed light on a practical phenomenon that offers the foundation for further discussions and could be an inspiration to take the

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discourse on a more concrete level. We believe that our conceptualization should be communicated into the practical domain of platform providers to help them get a better understanding of their role within the field of participatory platforms.

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