

Information Design for Supporting Collaborative Communities.

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Abstract: A growing number of people are organizing around common needs that affect their daily life meeting in new ways, seeking solutions and using digital technology for re-shaping their environments. This paper introduces the definition of Collaborative Communities and focus on the digital tools that they use. From the Information Design scope, it's relevant to observe and support their actions, supplying them with better tools for designing their environments. A first step is to identify which actions they pursue and the characteristics of the involved tools. Fourteen participative-map cases have been analyzed for both their visual and technical features as well as their outcomes. A data cross-matching was conducted between their objectives, foci and a typology of collaborative actions on digital platforms. It identifies a technological discourse regarding the use of platforms and tools, while a political discourse can be seen in the use of either open source or private tools.

Keywords: Collaborative Communities, Digital Tools, Information Design, Participative Maps.

1. Introduction

Today we are witnessing social changes lead by technology in an unprecedented way. We live in an open, complex, hyperconnected, dynamic world (Dorst, 2015). In this context, a growing number of people live in a world that is both highly problematic and highly connected (Manzini, 2015), meeting in new ways around common needs that affect their daily life seeking solutions. Collaborative concepts are emerging in a scenario where digital technologies are enabling a next society of citizens to create and use information instantly. These groups receive various names from different disciplines: from smart citizens (de Waal, 2014), urban hackers and open-source urbanism (Sassen, 2011), civic techs (Pahlka, 2015) or grassroots (Seyfang & Smith, 2007). This research focuses on the

use of digital tools involved in the processes of collaboration, proposing the definition of Collaborative Communities: groups of citizens who have an accurate diagnosis about a local problem affecting their daily life and who are motivated to seek a collaborative solution. While they are not tech experts, their actions are supported by digital technologies for organizing, collecting and diffusing data, and engaging and re-shaping their environment.

Which is the role of Design and how could it contribute to improve the process of Collaborative Communities? Design for next society should support Collaborative Communities' actions, supplying them with better tools for designing their environments. A first necessary step is to identify which actions they pursue and the characteristics of the involved tools. This research considers digital visual tools as the visual and digital interfaces, tools and visualizations that are available mainly on the web through accessible services (i.e. maps provided by OpenStreetMap or GoogleMaps among others). The visualization process is a tool for community building that gives people instruments to help guide individual and collective decisions (Manzini 2015).

The aim of this paper is to observe from the Information Design perspective the relation between the characteristics of digital visual tools and the purposes and foci of communities' projects. These tools are the bridge between members of a community and its social needs. It could be said that there is a correlation among the visual representation of information, its understanding and the practices of a collective discourse. The presentation and representation of information facilitate the understanding between people (Kirk, 2016). Without effective and solid tools communities will not be able to understand and reach their social needs, and no urban reshape at this level will exist. The study of these tools can give insights about how Collaborative Communities and networks are taking shape, where they are moving and the main social demands that communities are making among other. It is relevant to study these digital and social tools from the communication design perspective and especially through the lens of Information Design since they are built on the hierarchy of information represented in visual language, based on relevance and content that shapes the statements that provide insights into societal circumstances. Thereby they are reflections of societal activity.

This research is based on an exploration of 14 participatory mapping cases collected through a crowdsourcing initiative with a criteria selection of variety to representing different fields: housing, security, and urban economy among others fields. They have been analyzed with respect to their visual and technical features as well as their outcomes. The objective is to identify a typology of actions related to specific tools. For each case, a data cross-matching was conducted between the objectives and foci with a typology of collaborative actions on digital platforms (Baek; Manzini; Rizzo, 2010). The analysis identifies a technological discourse regarding the use of platforms and tools, while a political discourse could be seen as translated into the use of either open source tools or private ones. Different levels of knowledge on the use of tools and data have direct implications on the visual results of the maps and their possible analysis. This paper inquires how the analysis of the visual characteristics of social digital tools may be use to further understand the urban bottom-up initiatives and contribute from the Information Design perspective to the theorization of Collaborative Communities practices.

2. Cities, technology and citizens

In today's cities there is a strong relation among the role of citizens and technology which enables transformations in the shape of them and in the way they operate. Much attention is being put in the transformational roles on cities and citizens. Mainly these transformations are led by technologies that intervene in the hardware and software levels of cities (Sassen, 2011). The physical structure of

cities (the hardware) are increasingly being intervened by new actors or actors with new roles. In the last years new organizations of citizens are taking a leading role in the urban scenario, working collaboratively among them and with local institutions for achieving solutions to their social needs. Thereby the way in which citizens live and modify their environment (city software) is moving towards an open, complex, hyperconnected, dynamic world (Dorst, 2015). On one hand, technological artifacts and devices allows to trace the proliferation of citizen participation. The burgeoning of websites, citizen's applications and other communication artifacts put in evidence the proliferation of bottom-up organizations concerned with urban issues. On the other hand, the same artifacts and devices allows citizens to participate in the process of putting in evidence their social needs.

Devices such as smart phones allow citizens to be sensors of their own experiences, generating, collecting and sharing data of their environments and habits. Crowdsourcing strategies, citizen sciences, the quantified self-movement are some of the concepts that are heard often due to the expansion of technologies that provides people the possibility to trace and measure. Geographic Information System (GIS) technology allows non-experts to create maps of their own experiences. The accessibility, immediacy, customization, actualization and the scale detail of digital maps (conditioned to digital media, type of devices), enable users to be the new cartographers, extending the social function of maps. Another variable that strength the relation among data city, citizens and technology is the increasingly trend of public and private institutions of opening their data¹. Therefore, open and accessible artifacts, devices and data are conditions that strengthen the role of groups of citizens in re shaping their environment.

The increasing groups of citizens that are organized around city issues responds to a way of activism. Understanding activism in a wider sense than a political or ideological belief means to act, to take action upon matters of daily life seeking for a social good. The DACTACTIVE Research Project term Data Activism as the *increasingly engage in new social practices rooted in technology and data*². In a scenario where the subcultures of hackers and open source movements already exists, emerges a non-expert citizen as a new actor who uses data for activism. The above research identifies two types of data activism: re-active and pro-active data activism. The first one refers to citizens' resistance capacities to civil threats using technology; the second, to citizens taking advantage of the possibilities that data offer (for civic engagement, advocacy, campaigning). Both are reactions to a specific situation where *information is a constitutive force in society capable to shape social reality and are enabled (and constrained) by software*. Digital technologies, in particular the Internet, are taking an enabling role allowing people to collaboratively address social issues developed through online innovations or within mediated information systems. (Valsecchi & Gong, 2014).

The physical and virtual layers of cities converge in the process of using data for activism. The hybrid city (de Lange & de Waal, 2012) appears as an opportunity for citizens to tackle solutions to their social issues in networked communities. Digital technologies are driving people's social demands in a

¹ The Open Data Global Index project (<http://index.okfn.org/>), lead by the Open Knowledge Foundation, gather and rank countries openness. Since 2013 there has been a steady increase in the index per country being a trend the effort of governmental institutions to open their data.

² *Data activism: The politics of big data according to civil society* is a research project based at the Department of Media Studies of the University of Amsterdam. It is funded by a Starting Grant of the European Research Council, with Stefania Milan as Principal Investigator. See: '<http://data-activism.net/about/>'

velocity and range without preceding in history (Drukker, 2014). They have at hand open, free and usable data and tools that provides them a virtual lecture of the physical city allowing them to take action in both levels. Crowdsourcing and open-source data can be powerful tools for creating new city designs, solutions, and ways of governing. (Nicanor & Van der Leer 2012). Notwithstanding, reading the hybrid city requires knowhow on the physical space and tools, as the digital tools and data (that is to say to interpret and manage data transforming it into valuable information). For this process of interpretation and translation, visual tools have an underlying role on the transformation of citizens into new urbanists, the re-shapers of the city.

2.2 New ways of city participation

What is exactly participation and what is new on this? In 1969 Sherry R. Arnstein proposed a *Ladder of Citizenship Participation*, mainly focusing in the participative relation between citizens (the *have-nots*) with institutions (the *powerholders*). The proposed ladder is a model for presenting different gradations of citizenship participation based on cases of participation policies in United States during the '60. Despite the context have clearly change, the model is still a reference to differentiate modes of participation. Nowadays citizen's participation is being taken through technologies that enables a new type of participation, being 'Civic Tech' one of the most name concepts to it. From Arnstein's model, a Ladder of Civic Technology (Offenhuber 2015) proposed different levels and forms of civic engagement through technological platforms. This ladder of Civic Technology³ presents the relation between citizenship and technology, replacing the last one for institutions as in Arnstein's model.

³ The Ladder of Civic Technology identify different modes of participation through digital tools and platforms that allows citizens to gain with more interactions in the participative process. The lowest rung is '**Gamification**' or '**nudging**' where people are invited to succeed following instructions or rules encouraged by a reward, not even questioning them (i.e. electricity campaigns for lowering consume with economical rewards). **Participation as feedback** enacts collective knowledge of communities as a powerful tool. Participants are invited to identify conditions of a specific situation and report them through crowdsourcing platforms (i.e: citizen reporting apps such as CarsInBikeLanes, <http://carsinbikelanes.nyc/> which allows citizens *relentlessly documenting the perilous indignities of New York's under-enforced bike lanes*). In the next rung, **Participation as monitoring** citizens who could follow an already reported situation could collect data and evidence that enable the creation of strategies and mechanism of dialogue with the *powerholders* (i.e. FixMyStreet, <https://www.fixmystreet.com> is a reporting and monitoring app which allows citizens to report and follow the state of the total collection of demands which arrives directly to authorities). **Participation as co-production** involve citizens in planning, implementing and managing public services (i.e: Madrid city council launched in 2016 the program and platform DecideMadrid <https://decide.madrid.es/>, where citizens proposed diverse urban and community projects. After an open citizen voting system, the most voted projects will be developed by the city council using up to 60 million euros). Finally, the last rung is **Participation as self-organization**, refer to systems that are entirely created and managed by their users (i. e: Wikipedia).

LADDER OF CIVIC TECHNOLOGY PARTICIPATION

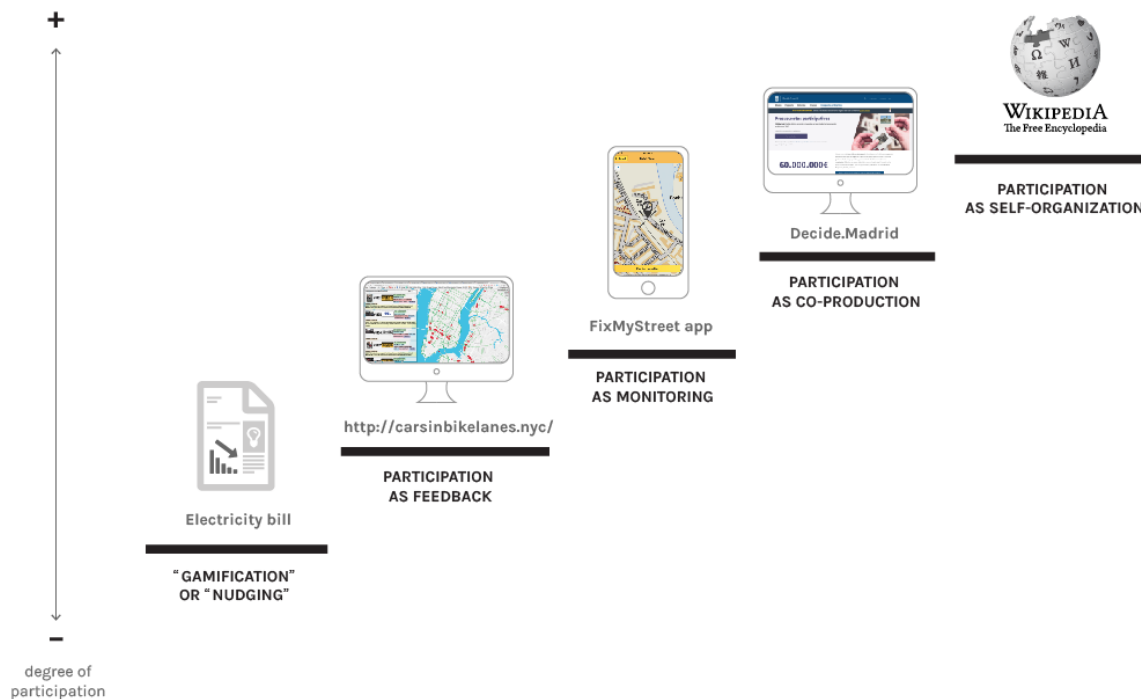


Figure 1. Schema for the ladder of civic technology participation based on D. Offenhuber’s ‘Civic Technology - Tools or Therapy?’. Each rung is exemplified with an actual tool or platform. Schema from the author.

The tools and platforms of each rung present similarities and differences on their visual information features. In particular maps are elements present in diverse type of participative initiatives mostly because the georeferenced feature (data related to a specific territory: position on time, meta-data of images, among others) is one of the powerful resources of technological devices such as smartphones. The link between data and territory enable citizenship to be sensors of their reality and behavior, blending physical and digital space. These new ways of interacting with the physical space are experienced through visual interfaces and tools.

The civic technology ladder is a model of types of participation between citizenship and technology. These types of participation don’t work in isolation mixing and overlapping in most cases. Partly because participation as a process is not linear or structured in one way. Perhaps there is no participatory practice as such, there are only *instances of participation*, which can be studied through their media objects (Niederer & Priester 2016). Tools and platforms for each instance of participation also overlap and mix varying on the possibilities of their interfaces.

2.3 Different perspectives for the same phenomenon

In recent literature are plenty of concepts from different disciplines that describe the actions these groups of citizens are performing. This put in evidence the relevance of the topic in the research agenda. They are different terms describing the same phenomenon (from sociology, urbanism, social innovation, among others). From smart citizens (de Waal, 2014), urban hackers and open-source urbanism (Sassen, 2011), civic techs (Pahlka, 2015) grassroots (Seyfang & Smith, 2007), or networked publics (Varnelis, 2008). Nevertheless, there still are unexplored perspectives related to their design.

Among these definitions is possible to identify certain similarities answering to the *who*, *what* and *how* of the phenomenon. *Who* are the main players of the phenomenon? It is present through the diverse definitions the concept of networked structures of activists organized in community groups, organizations or others type of collective citizenship association in which the main concept behind is related to collectivity. *What* are these groups seeking for? They seek for solutions that respond to local situations and benefits their community. They understand that their immediate environment could be transform because is not finished or closed (Sassen, 2011) actively taking part in efforts to come up with better solutions. *How?* Community groups are the starting point for urban change (Nicanor & Van der Leer 2012), leveraging bottom-up projects using *Do It Yourself* resources. Digital media appears as a tool which allows citizens to engage with, organized and act upon collective issues (de Waal 2016) appropriating technology by questioning how things work for creating new ways of doing.

So what is missing? We are observing a process of self-organization of citizenship around everyday problems in the context of city using digital tools. There is much to say from Design perspective on topics related to self-organization of communities, participative design processes of citizens-authorities, on the implementation, evaluation and maintenance of projects. Specifically, from the Information Design point of view there are plenty of issues related to one of the most fundamental pillars of the construction of these types of participation: trust and transparency (Agarwal, Barthel, Rost, Borning, Bennett & Johnson 2014). Communication is key for ensuring trust and transparency, and its design relevant to enhance community engagement.

This research proposes a new definition for the groups of citizens that are organized around city issues in an active and bottom-up way, inviting to amplify the foci studying the ‘how’ and ‘with what’ of the phenomenon, focusing in the use of digital visual tools. ‘**Collaborative Communities**’ are group of citizens who have an accurate diagnosis of a local problem that affects their daily lives and which they are motivated to collaboratively seek solutions for. Despite not being tech experts, their actions are supported by digital technologies that help them to re-shape their environment. They are mainly formed as a reaction to unresolved issues rooted in institutional inefficiencies, socio-economic disadvantages or the non-existence of solutions to new problems. This definition embraced the idea that citizens (defined as people who lives in a city) have knowledge about the problems that daily affect their lives; have the motivation to solve it in collaboration with other citizens; use digital technologies for their purposes of reshaping their environment. They are a reactive result of unsolved issues. In this contexts, a theoretical assumption is the existence of a social mind shift that encourages individuals to take part in developing new structures.

2.4 Why look at tools

A tool can be defined as “a device or implement, especially one held in the hand, used to carry out a particular function”⁴. When we speak of a tool there are four aspects to consider: a user, an object, a function and a purpose. Just as a hammer is a tool that a carpenter (user) uses to hammer nails (function) and thus build something (purpose) we understand that digital tools are used by Collaborative Communities for taking action and where the final objective is to meet a social need. For this research tools are the visual elements used to implement actions that fulfill the purposes of the users involved. What are the tools that are leading to the development of new social dynamics and how are they being used? The actions that are carried out by various communities are based on platforms that allow them to perform such actions and achieve their goals.

⁴ Oxford Dictionary 2016.

The tools that are referred to in the study are those present on digital platforms that gather data about people's experiences, enabling them to collaborate directly in the collaborative community process. They could be online platforms, websites, social networks, apps or the Internet itself. There are certain conditions that make these tools truly collaborative and open, such as each user retaining the authority over their own data and at the same time having open-lock mechanism to it, being neutral platforms that allow everyone to participate under the same conditions, being inclusive in terms of affordability and usability, and not discriminating against users (Sestini, 2015). It could be said that this last condition is directly related to the visual interface of the elements and tools of the platforms. If a collaborative platform is not properly set up, users will not have the chance to participate. It exists a strong relation among digital technologies and the social changes that are taking place. Society now has new tools for organizing and manifesting their opinion almost instantly.

Other perspective for analysing Collaborative Communities' digital tools is from the structure point of view, which is intrinsically to its design. This refer to the technical characteristics in which tools are built and hosted. Reviewing what platforms are associated to the tools or the origin of the applied API's (Application Programming Interface) can reveal how are these technologies are being managed. It could be inferred the relationship between access and security policies of each tool and how do they limit or not Collaborative Communities actions. The technological structure of the tool finally holds its execution and therefore shapes the action of activists. Can the technological analysis tools say more about how they are working Collaborative Communities? Is there congruence between the technological and social discourse?

3. Case study: analysis of 14 participatory mapping cases

Among the diverse tools involved in Collaborative Communities' processes, participatory mapping appears as one of the most diffuse practices in a wide range of bottom-up projects. The use and lecture of maps are a massive tool because of its visual relation with the people's knowledge of their immediate territory and its wide presence in diverse technological devices (especially smartphones that already has georeferenced sensors). Participatory mapping mingles participative methods with cartographic tools (they could be digital or analog) seeking to represent the collective knowledge of a specific community. In most cases members of Collaborative Communities don't have cartographic, urbanistic or other expert skills, nevertheless they are connoisseur of the local environment.

Mapping is a means, not an end (Ares & Risler 2016). Mapping is part of a process in which their participants collectively shares knowledge and practices. Through a common graphic and visual language on one platform, participants bring their experiences and gather a new collective knowledge. Maps should be clear enough to bear a communicational aim of transparency and participation.

This research is a first approach to the analysis of the tools are carried out through the study of participatory maps. They have been selected and explored 14 different cases looking at their goals and participative function. These cases were collected (and kindly provided for this research) by the 'Mapping the Social City'⁵. The criteria selection responds to the represent the biggest variety of

⁵ 'Mapping the Social City' project (http://www.social-life.co/project/mapping_the_social_city/) was leded by Social-Life, a social enterprise created by the Young Foundation which is a specialist centre of research and innovation about the social life of communities.

fields cover through the cases (fields such as housing, urban planning, academic research, local identity building-up, among others).

3.1 Method

From each participatory mapping cases it was manually extracted from their websites the following fields: description of the project (mainly founded in the 'about' section); starting and finish date; city and country of origin; city and country of service area; field(s) cover; map application service and platform service. The following table contains some of the fields while the rest is summarized later in this document:

Table 1: Case study descriptions

Project	Web site	Origin	Service area	Start date
Map Kibera	http://mapkibera.org/	Kibera, Kenya	Kibera, Mathare and Mukuru, Kenya	November 2009
Where in Wally?	https://architectse17.wordpress.com/where-in-wally/	Walthamstow, United Kingdom	Walthamstow, United Kingdom	May and June 2015
Sahmakum Teang Tnaut	http://teangtnaut.org/the-community-enumeration-and-mapping-workshop/?lang=en	Phnom Penh, Cambodia	Phnom Penh, Cambodia	December 2005
Mapping the urban social economy - South Korea	http://www.mapplerk.com/semaph/	Seoul, South Korea	Seoul, South Korea	
Anti-eviction Mapping Project	http://www.antievictionmap.squarespace.com/	San Francisco, USA	San Francisco, USA	September 2013
Big Neighbourhood Data	http://www.social-life.co/project/big-data/	United Kingdom	United Kingdom	
26'10 Ruimsig	http://www.2610south.co.za/gallery24.php	Ruimsig, South Africa	Ruimsig, South Africa	2011
Mappiness	http://www.mappiness.org.uk/	United Kingdom	United Kingdom	August 2011
Commonplace Peckham Rye	http://peckhamcodesign.org/	Peckham Rye, United Kingdom	Peckham Rye, United Kingdom	2014
SynAthina	http://www.synathina.gr/	Athens, Greece	Athens, Greece	July 2013
MappiNa	http://www.mappi-na.it/	Napoles, Italy	Napoles, Rome and Milan, Italy	
Voices of Youth	http://www.voicesofyouth.org/	Brazil and Kosovo	Buenos Aires, Argentina; Thimphu, Bhutan; Rio de Janeiro, Brazil; Einstein, France; Port au	2011

			Prince, Haiti; Prishtina, Kosovo; Madagascar.	
Community 21	http://community21.org/	Brighton, United Kingdom	Galway, Ireland; Brighton, Sussex, Plumpton, Eastbourne, United Kingdom.	2014
Humara Bachpan	http://www.humarabachpan.org/	Bhubaneswar, India	Bhubaneswar, Berhampur, Hyderabad Mumbai, Patna, Bhopal, Indore Delhi, Bangalore, Ahmedabad, India	November 2012

3.2 Which actions do collaborative communities pursue through participative maps?

The description of the project provides information about their purpose and focus. In some projects the purpose (objective to be attained) and focus (the center of the project) were very clear. An example is the Map Kibera project which has clear statements of purpose and focus on its website: *'citizen mapping is used to put marginalised communities on the map and amplify the voice of the community in the Map Kibera project'*⁶. The purpose is to use information to support community goals in their location of operation while their foci are to invite people to be active part of the building-up of Kibera in a harmony community coexistence. In other cases, it was required an extensive analysis of the complete project because a precise definition was missing. The respective purposes and focus were categorized through a data cross-matching between the objectives and a typology of collaborative actions on digital platforms. This typology was based on the "meta-goals" defined on the paper *Sustainable collaborative services on the digital platform: Definition and application* (Baek, Manzini & Rizzo, 2010). From the meta-goals, it is defined the following purposes:

- **Producer/consumer network.** Producers and consumers pursue mutual benefits by establishing a direct network. People collaborate, share and exchange products, competences or knowledge.

⁶ In November 2009, a group of young Kiberians created the first free and open digital map of their own community. Before this, Kibera (Nairobi, Kenya) was not even represented on, being nobody's land. Map Kibera has now grown into a complete interactive community information project, being a big concern to share information widely within the community. They use media resources (online video, blogging, and reporting on the Ushahidi "Voice" platforms), and locals provide a local news service allowing the local perspective to be showcased online. <http://mapkibera.org/>.

- **Mapping diffused information.** People collaborate positioning geographic information in a collective map.
- **Aggregate social action.** People act together and use their collective power to achieve certain social goals.
- **Creating a network for social conviviality.** In this typology, the primary goal is to improve social conviviality by forming and reinforcing a social network.
- **Mutual support circle.** Users provide mutual support to one another in order to solve problems that they have in common and that are not necessary in the same location.

Given the complexity of each project, it was possible to determine that more than one meta-goal was crossed with each project. The third node of the crossing matrix was related to the focus of each project. Despite their differences and purposes it was possible to see that more than one project seeks for similar actions. The focus definition was also based on the objectives and mission of each project. In order to this, four focuses were present among the cases:

- **Conviviality.** It promotes the harmony coexistence of a community.
- **Urban Planning.** It promotes the strategic organization of an area.
- **Networking.** It promotes the strengthening of the relations between people with same interests.
- **Activism.** It promotes people to be active part of a political issue.

The *Anti-Eviction Mapping Project* is an example of activist mapping: the purpose is not only to engage local communities and to understand how evictions are taking place, but to explicitly change policies affecting the city. The examples demonstrate that maps and the act of mapping can pursue a diverse range of social needs, have different purposes, with different focuses.

The Alluvial diagram (Figure 2.) shows these different relationships between projects, their purpose and focus. Beside the respective purposes of these mapping examples, it is possible to recognize some patterns between them. Many of the worldwide participatory mapping projects studied are related to conviviality and networking focus. In the other hand, more localized mapping projects often had a focus on activism.

Alluvial diagram. Relationship between projects, their purpose and focus.

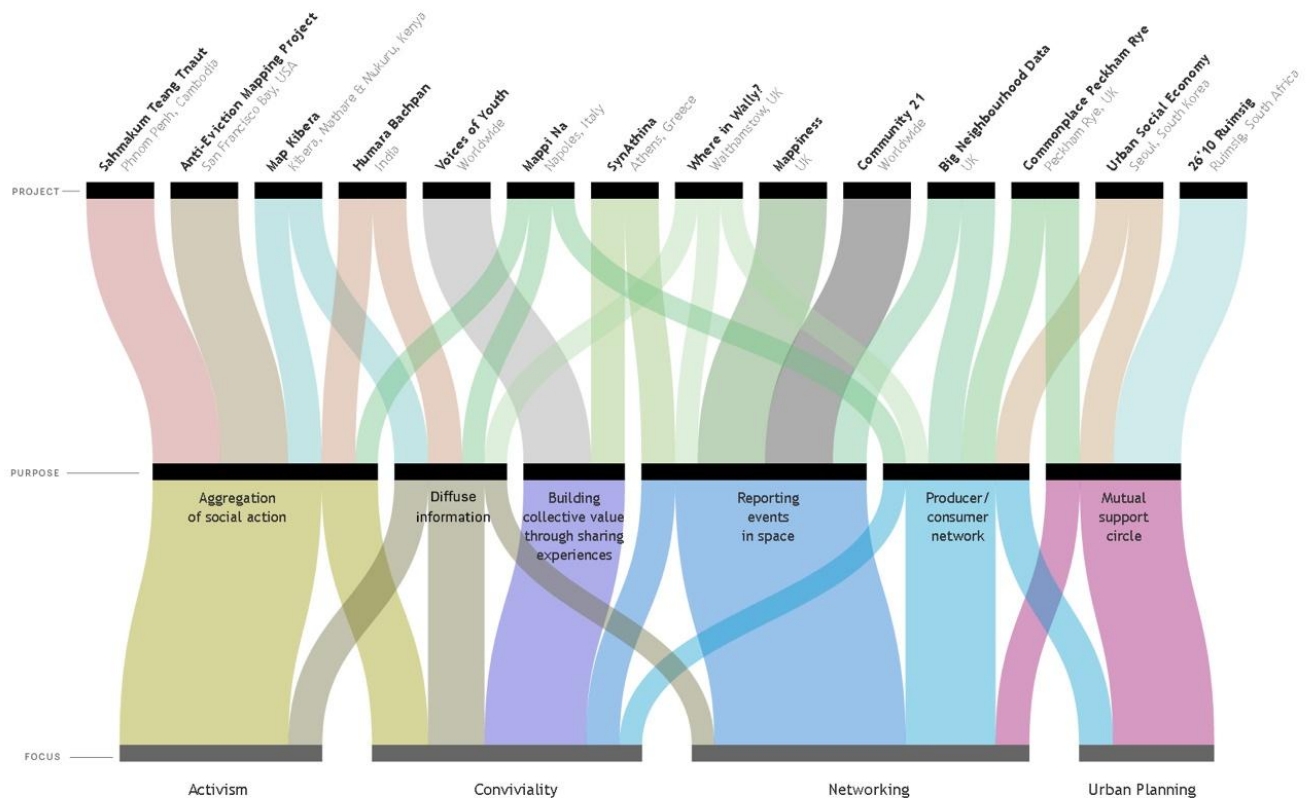


Figure 2. Alluvial diagram. Relationship between projects, purposes and focus. Made using RAW, web application developed by Density Design Research Lab, Politecnico di Milano. www.densitydesign.org.

Despite looking very different and coming from a range of cultural backgrounds, is possible to identify certain patterns through the case studies. Most of the cases which purpose was to aggregate social action have a focus on activism (Map Kibera, Anti-Eviction Mapping Project, San Francisco, Voices of Youth). Each of these cases are performing significantly very different types of activism but with a common purpose. The next question should be: Are these patterns visually coherent on maps interfaces?

3.3 Are all participative maps really participative?

Technology enables and constrains the possible actions that could be performed by Collaborative Communities. For example, in one hand technological devices such as smartphones allows people to be sensors and gather data of their environments. But in the other hand if people don't have coding skills they would not be able to customize and edit with highly precision that data on a map. From the case studies we can see that there exists levels of data manipulation on maps that goes from simple interactions (mostly presented in cases that use GoogleMaps API) to more complex and dynamic data visualization (i.e. Anti-Eviction Mapping Project San Francisco). Since Collaborative Communities are not tech experts, the visual interfaces of the tool are key for making participation happen.

“They are widely differing cases but with a common denominator: in them visualizations process is also, and directly, a tool for community building“.
(Manzini, 2014, p.122)

Are all maps really participative? For answering this is necessary to look not only the visual features of maps. It is required to look over the complete process of participation since participatory maps are part of a bigger process that is combine with participative methodologies. Nevertheless, is still relevant to analyse the visual characteristics of tools to discover how the community building is being performed and how could it be improved from its design. In order to this it is performed an analysis of the visual and technical characteristics of the cases.

Visually, most of the examples use cartographic maps as the main element or base. However, in most of the cases the cartographic map base works together with other tools like pictures, text comments, personalized icons and color-coded tags. The available visual interfaces of cartographic bases vary, mainly depending on the possibility to edit them, availability and access. It can be seen that digital participatory mapping often uses existing cartographic bases that are standardized and work synchronously with other applications. Participants and those who are interested in the results may be more at ease with maps that they already know and use. To make both the process and the results as accessible as possible, it is important to represent space with visual logics with which are already familiar.

From the technical characteristics of the maps, it is possible to identify differences in their cartographic interfaces. The most relevant difference is the possibility of editing, contribution and its free use. GoogleMaps is a popular API (Application Program Interface) for maps, offering many usability possibilities (for example, flexibility across different devices), but is not an open source map like OSM (OpenStreetMap.org) that gives the possibility to edit the base map itself. *Map Kibera* used OSM: people involved in the project were able to freely measure and upload the cartography of Kibera contributing new knowledge to their community and to the world. Maps developed with programming language use style libraries that permit the developer combine more layers of information applying customized visual variables and elements such as icons, style labels, chromatic palettes and fonts among other visual variables. An example of this are 28 maps available through the website of the Anti-Eviction Mapping Project San Francisco were developed based on OSM in combination with Leaflet, D3 and CartoDB. This maps have a diversity of combinations in their visual variables and interfaces related to the topics they represented.

The cartographer Jacques Bertin said the problems of modern cartography are not related to the accuracy of the measures but centre on the graphic transcription of the data. Misleading icons, or the use of a wrong colour palette, can change the meaning of the data represented on a map. The job of a cartographer is to control and represent the data through the different visual variables so the user can read it clearly. Usually there is no “one cartographer” in charge of looking the resulted map of participatory process so the visual definition of the elements is key in the non-expert’s interaction.

Through the personalization of the visual elements used on maps, it is possible to enhance the engagement and insights of the participants and the community. A good example is the *Where in Wally?* project where the customization of the tag point (the Wally icon) enriches the storytelling of the whole project. People can easily navigate the GoogleMaps interface but what makes them realize that they are not just on a GoogleMaps is the tag point, reminding you that you are tagging “Wally”.



Figure 3. Visual components of *Where in Wally?* project: (a) tag point, (b) map and (c) QR codes printed and distributed in the city of Walthamstow.

Even though default platforms only supply a limited number of elements to combine and customize, these maps can be complemented with other tools and platforms that make them unique and contextualized to the cultural background of the project. *MappiNa* invites the community to post and upload to their website pictures and sounds from Naples. The maps are complemented with Soundcloud players and images. In this way people easily upload and share their point of view of Naples, adding a particular narrative beyond the map.

Are these patterns visually coherent on maps interfaces? The visual elements and interfaces used in participatory mapping can reflect the motivations behind the map. The following table shows the relationship between the technologies, maps and focus of the case studies. Projects that focus on activism often work on OSM instead of GoogleMaps. This matches activism discourse with open source tools that have no “limits”, and are not linked to a private company. On the other hand, projects with a conviviality focus often uses GoogleMaps as it offers an interface more familiar to a wide range of users. This is valuable where a project wants to engage a new community already familiar with online maps and introduce it to mapping.

Table of projects, base maps, platforms and their focus



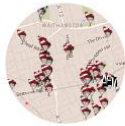











	CONVIVIALITY					URBAN PLANNING	
							
PROJECT	Big Neighbourhood Data	Mappiness	Where in Wally?	SynAthina	MappiNa	Common-place Peckham Rye	26'10 Ruimsig
BASE MAP	Google Maps API	Google Maps API	Google Maps API	Google Maps API	Google Maps API	Google Maps API	
PLATFORM				Crowdapps		Common-place	
	NETWORKING				ACTIVISM		
							
PROJECT	Urban social Economy	Community 21	Humara Bachpan	Voices of Youth	Anti-Eviction Mapping Project	Sahmakum Teang Tnau	Map Kibera
BASE MAP	Google Maps API	Google Earth		Google Maps API	OSM + Leaflet, D3, Carto DB	OSM	OSM
PLATFORM	Mappler			Locast	Crowdmap .com		Ushahidi

Figure 4. Table of projects, base maps, platforms and their focus.

4. Conclusions

This first exploration allowed to compare and find similarities among participatory mapping projects. In mostly all of the cases, maps were inside platforms that hosted other elements and functions. This could be understood as participative maps doesn't work isolated and mostly need to be supported by other elements in the same platform. Other aspect that was compared among the cases was the provenance of the base map: mostly of the cases present maps based on already existing maps applications (i.e. GoogleMaps API, OSM, among others). Crossing the purpose and focus of each participative map with the information of the base map, give interesting insight about the correlation between how the communities represent and make visible their discourses.

Through the case study was possible to found what makes mapping an effective tool that offer new insights on people' experience:

- **Social digital tools as social mapping doesn't work in isolation.** They are inserted in complex dynamics that are integrated with platforms, organizations, events and actions,

pre and post mapping. The engagement and insights on people experience is complemented by more than one tool and physical actions.

- **There's no formula** for recommending how to use what kind of maps and complementary tools. It is a process tailored by the grassroots, which perform according to their codes and knowledge of the social needs they seek to satisfy.
- **The existence of a technological discourse** on the tools, API's and platforms. The congruence of technological discourse. with the focus of the project varies.

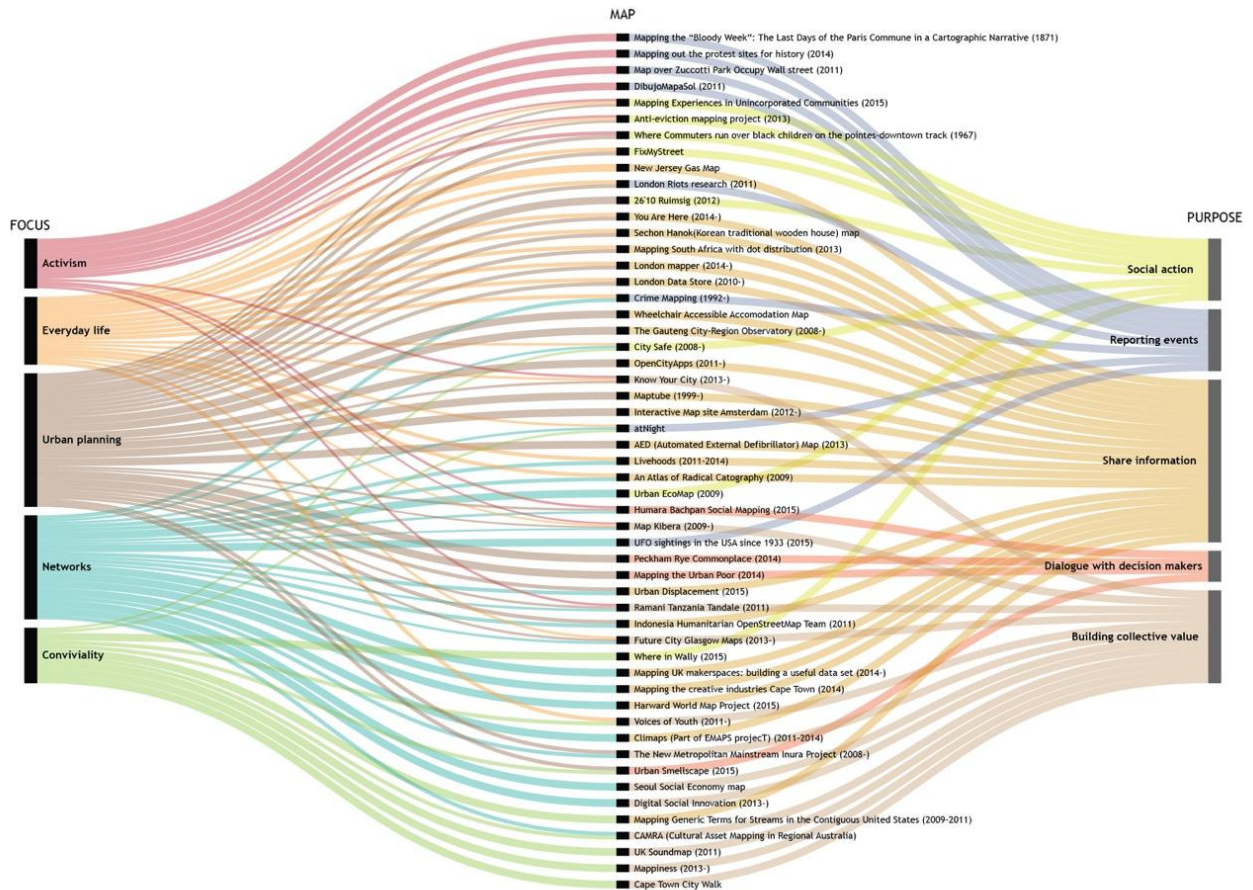


Figure 5. Alluvial diagram. Relationship between projects, purposes and focus. Second analysis iteration including more case studies. Diagram made using RAW, web application developed by Density Design Research Lab, Politecnico di Milano. www.densitydesign.org

The design analysis of digital and social tools deliver new insights about how Collaborative Communities are conducting social changes. The data found indicates a relationship between the project purpose and the technology used. The congruence or not congruence of technological discourse of the tools vary according to the focus of each project. On the other hand, there is a strong relation between collaborative community processes with tools trade by companies. Collaborative Communities not necessarily use the bottom-up tools and in many cases — according to the consistency in its technological discourse with the purpose of the project— will use top-down tools or developed and trade by private companies.

There is a lack of information about successful and not successful collaborative projects and there are missing methods to evaluate these tools efficiency. Whilst this first experiment proposes an analysis from the design and function of the digital and social tools, it aims to highlight aspects that may contribute to future evaluation indicators. So to find evidence about their effectiveness and contribute to demystify the “world changing” power of digital technology. The use of technology and collaborative platforms are not synonymous of improvement and the overcoming of the problems that affect society. Although tools don’t work isolated (quite the opposite they are part of processes that involves diverse integrated actions), it is relevant to see if they are making easier for communities to change and improving their way of living.

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