

Learning Participatory Urban Research

Towards a Network of Collective Ingenuity (OURB)

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This research was put together by four Master's students from KU Leuven Faculty of Architecture, who are self-motivated to investigate the possibilities of collective methods for designing within the Urban context. This paper is divided into two parts, the first being a scholarly investigation into learning from the collective mentality shift, and movements; discovering the added values of operating immersion/eversion from the virtual worlds to the physical one and analyzing key factors for engaging the public on online communities. Following, the paper brings to light the challenges the future of urban planning faces during today's digital shift and the solutions possible through the introduction of digital platforms as support to urban planning structures. The second part is the complementation of the first, as the research team showcases the findings by testing out the learned concepts and conducting on-field social experiments. The paper concludes with an analysis of the results, and future directions to the research project.

Keywords: *collaboration, co-creation, collective ingenuity, digital platforms, social engagement*

INTRODUCTION

Over the past decades, the basic capacities of information and communication technologies (ICTs) have shown exponential increases in performance relative to costs (EEA, 2016). Even though ICTs can be powerful tools to build communities and enable cooperation, we will only reach meaningful results when technology begins to be accompanied by political and citizen's will to reinvent the way we cooperate, live together and build our future. Whereas technology is essential, true collaboration is cultural and be-

havioral: it requires 'to care', caring for others, caring for shared purposes (Rossetti di Valdabero, 2016). The key to success lies in a hybrid collaboration of the physical and digital, where challenges can be collected in the physical and virtual, and bring inclusive wise solutions for all. The sharing of knowledge and ideas creates exchanges. The world is full of untapped intellectual resources that can now be mobilized. By coming together, it is possible to tackle the current challenges and find solutions more effectively (Lévy, 1994). Our cities are currently fac-

ing tremendous economic, social and environmental challenges; but we can provide solutions that exist by doing more with less.

The currents from collective ingenuity

The internet allows for different systems that gather, combine and distribute real-time data information, made available during every moment of our daily life to have a more efficient and connected city for smart developments. This powerful source of information gives way to the emerging socio-economic currents of crowdsourcing, like the makers movement, the circular economy, the inclusive economy, and the economy of sharing and “Smart city” approach which integrates many of these concepts. These currents explore smarter ways of living together with the support of digital tools and platforms of that have recently been created.

Co-creating makes it possible to find solutions that nobody can achieve alone (Hesseldahl, 2017). The world is full of great ideas, valuable information and helpful hands that can be leveraged - as long as they are open to them. Embracing this attitude of inclusiveness allows for the outsiders to become a part of the solutions to their own problems, giving power to the powerless. Emergent paradigms as the one of circular economy show how many people have special skills or knowledge that others can benefit from - if those who need them, know where to find them. In the past, it was difficult to connect people interested in sharing, today social media makes things easier. Thanks to new currents platforms are created in which needs and resources correspond, and trust can be built (Hesseldahl, 2017). This is why online platforms emphasize the importance of user transparency, recommendations and evaluations by previous users.

Possibilities of using collective ingenuity's power in the urban context

Recently, in the context of urban design, planning and development, there is a sense of a more equal contribution of ideas and solutions, with a co-creative attitude. Governments are recognizing

the value of opening up to external contributions, even if this means losing some control over the results. In a future prospect, leaders will be forced to abandon top-down management because contributors to a project may be from other organizations - even clients or volunteers, and good governance will consist in motivating others by the insight of their constituents. Intellectual property will need to be rethought: to encourage co-creation within an open ecosystem, IP must stop being an intellectual protection to become an intellectual partnership. And finally, citizens will understand that co-creation is an opportunity but also a requirement.

There are plenty of good citizen engagement practices out there but they are underused within the planning system. Citizen engagement follows the traditional ask/respond consultation model and is largely dictated by legislative requirements, repeatedly reaching similar demographics. Often occurring too late in the process, citizens input often has little influence on decision making. Engagement usually takes the form of ‘objections’ and citizens lack a positive way to influence plan making and local development in a meaningful way.

Solutions from a digital platform which harvests collective ingenuity

In this paper we suggest that a possible way to harvest collective ingenuity might be by establishing a “one stop source”, a digital platform with the support of local initiatives. A co-creation format where we can merge diverse data sources; physical site and environmental assessments from experts, with citizens’ valuable local wisdom. The idea is to facilitate the communication of all city actors simultaneously in order to find connections and patterns in order to build a strong evolutionary analysis of the urban fabric. To be able to detect problems to turn into possibilities and open up opportunities for smart design proposals to arrive. Within this context and believes we are currently working on building our own digital platform called OURB and physical platform called OURB on Wheels and Heels. The aim of this project is to sup-

port the communication and collaboration between stakeholders of a city, by providing tools, that will bring them together to discuss information, share expertise, and create connections that will inspire a collective development of a city.

The platform will be based on a user intuitive map where the information can be visually organized via GIS location, storing multiple layers of information. As a digital crowdsourcing platform, it will constantly be evolving and therefore displaying the most current information about the city. Users will be able to share their needs, desires, proposals and oppositions, which will be tracked and displayed. Therefore creating the most updated overview analysis of the local knowledge for urban development. The platform aims to have the capability to collect data for analysis in order for city experts to contribute knowledge. It will also bring social input for investors and municipalities who look to have a greater understanding on citizen relation with proposed architectural and urban projects. The overall goal is for a more efficient and democratic way of communicating and discussing projects to take place. On which the public and local experts have a louder voice in order to reduce the risk of investment and merge top down and bottom up strategies.

Local issues within the planning systems and societal challenge

The initial inspiration for this project is also stating the issue of why it is important to do this project. While attending a workshop in Belgrade about creating livable cities, the research team had the chance to learn about the city's future development projects and personally observe what are the conflicts that arise from the way the decision process is held. Big protests against this projects with around 150.000 people participating were not enough to fight the absence of democracy and transparency. Talking with Arnstein's (1969) words, the level of participation of citizens in this case was absent and reduced to a mere manipulation of the civic will.

During next four to five months the research group have been researching the application of a possible platform for social engagement taking it into the Belgian context, looking deep into the planning system in Belgium in order understand the transparency and democratic level in the country in which the research was held.

Brussels can be taken as a particular case in which the government is trying its best for increasing the participation with city projects through neighborhood contracts. This system organizes small scale projects which are developed with a "roundtable" style discussion on the possibilities and have those small scale projects developed. Neighborhood contracts are an example in Europe for the methodology that is behind them, but this system still seems to be not hundred percent efficient and there are still evident obstacles in engaging population in a consistent way. This issue reinforces the research group's theory of whether an interactive online platform could be a support to the planning systems, and enable discussions online and help to share information and expertise at all times.

METHODOLOGY

In order to test the affordability of the theory and strategy of a project for a sustainable online platform, our research team decided to conduct empirical tests in which some potential feature to enhance engagement of the public users on digital platforms are tested through physical interfaces, that already represent what we called OURB on Wheels and OURB on heels. The aim of these experiments was to make the physical system to collaborate with the virtual one, to crowdsource the problems and dreams of a community and foster the emergent horizontal and inclusive design attitude.

The experiments on the physical field are part of a research on users' engagement methods that works through to the comparison of two realities: the one of physical interfaces and the digital ones. Our literature review revealed that. Online platforms support bottom-up collaborative ontology building and

allow user-based interpretation of heterogeneous information (Pak and Verbeke, 2010). Virtual environments can foster critical thinking and innovative thinking, re-discussing also the role of experts. Virtual realms have a potential to extensively redefine the existing realities and relationships, and to facilitate collaborative knowledge construction. However, assuming the positive potential that comes from the use and interaction with these systems, some negative aspects has to be considered: certain characteristics of human commitment in the physical environment are not replaceable with the opportunities offered by the confrontation with a virtual world. There is a fundamental asymmetry between physical and the virtual spaces: aware of the potential of both one and the other as well as their limits, the research team decided to merge the positive factors of the two contexts transferring them from one environment to the other and vice-versa, through the so called practices of immersion and eversion (Newton and Pak, 2015). In this way, practices that are recognized to be sustainable in one setting are transposed and tested into the other, and eventually brought back in a developed version. Thus, the field experiments represent the second step of the investigative process; after a research about the potential features that foster the participation of public users in online platforms, the team applied the relevant findings to test the physical field research. According to the methodology, the results of the second step of the research could then support a further study on the applicability of certain features to strength both online and on field engagement.

ICT A TOOL TO ENGAGE AND FOSTER PARTICIPATION

The idea of the internet of things (IoT) have allowed almost anything to be connected. This connectedness makes us aware of what is happening around the world, and is now shifting to a more proactive stage. Not only harvesting and sharing but also allowing for it to develop into a wider discussion and start tackling problems we are currently facing; from

urban challenges to economical, political and cultural ones.

Users of online communities are becoming more and more proactive, they stop being spectators and start acting as participants. They are not longer part of a silent audience but instead are become active contributors. Meaning they contribute knowledge and information to online platforms, but also formulate an opinion. Opportunities for civic engagement can be expanded in urban design through collective intelligence.

ICT tools can be introduced in participatory urban design strategies as a tool to engage and foster participation. The strength of online communities lies in the engagement of its users defined by the users profiles/personas.

Through the analysis of different case studies on the behavior of online platforms' users, it's possible to identify factors that define people's engagement; Engagement of the users' persona is based on three critical factors: *trust, control, and motivation*. The status of a user's' persona is one of the main factors that determine how users interact on online platforms, and how they cope with trust and control. *Anonymity and identification* are also different factors to take into account.

Anonymity allows users to feel a sense of security and privacy; it allows all members to participate equally, since the physical interaction is missing, discrimination is harder to form and all users are able to voice their opinion equally. Anonymity grants people the ability of speaking their mind, leading to better discussions, better content. However, anonymity can translate into de-individualization, turning into poor, false or malicious content. With de-individualization there is also the danger of group behavior, called 'bystanders apathy'. When opting for anonymous profiles, the platform needs to set rules on how users should behave. The private nature of verification enables mutual trust between the users of a platform. The more users trust in their peers and in the platform, the higher their engagement level will be. However, identification could inhibit free ex-

pression. When the basic critical factor is established; trust and control, motivation is a way to increase the engagement of the users of a platform.

Another great tool that has shown to increase the level of motivation leading to engagement is *Gamification*, because of the following reasons: it motivates users, playing triggers positive emotions, and the achievement of something makes us feel better. By playing we learn to develop strategies, specific knowledge according to contents and by playfulness, moreover, anxiety is reduced, creativity boosted, social relationships established. Those activities that are properly gamified, derive into a greater participation level. The most successful kinds of gamification are simple; they are about one kind of action leading towards one kind of outcome. *Validation, completion and prizes* are the most common gamification methods on online social media.

Introducing ICT tools in Civic engagement

ICTs can promote better informed decision-making by providing city stakeholders with appropriate, up to-date and actionable intelligence. ICTs offer new and improved ways of ensuring citizen participation in planning decisions, for example through the use of e-consultations, gamification and engaging virtual communities.

Civic engagement can be expanded in urban design through introducing ICT tools as tool to engage and foster participation. Community members play a more active role than just 'likers' on a regular online platform, the participants spontaneously assume responsibility for the community and uphold its spirit and culture. People tend to be more productive in a community, because they already have a place within this community. The users will act as co-innovators in this co-learning context and produce knowledge together with researcher.

This inter-sectoral thinking will lead to the development of innovative methods and novel design concepts which will be implemented, tested and evaluated with the continuous participation of these actors. In this way, research will go beyond

disciplinary boundaries and integrate non-academic knowledge, enabling learning from real-world practices. The position of the researcher will be of an active nature, and the research will be structured through cycles of action research. In these cycles, the researcher will work in close contact with local and governmental organizations for facilitating the continuous negotiations of sense-making and scope refinement among the contributors. Participatory collection of information and analysis will be organized in the form of co-creative participatory sessions with the users on-site.

For now, using online tools in urban development, hasn't reached the decision making stage yet. Decisions are always made within these organized physical workshops. This means that the platforms, as well as Facebook and blogs, don't provide the right type of communication to make decision making happening.

EXPERIMENTS: OURB ON WHEELS AND HEELS

The diversity of the exercises carried out in the physical environment challenged the way we communicate different kinds of information. Experimenting diverse communication approaches is relevant to stimulate people's critical creativity and using alternative research tools can bring up unexpected output; developing different exercises had been a way to test the suitability of different tools that could be inserted in a virtual interface as well. For this research, two different experiments have been performed: the first one, called "*OURB on wheels*", has been tested twice in two different environments and has been carried out with the help of a van, which acted as a physical supporting interface and an attractor enabler, representing an inclusive space to gather people. The second experiment, called "*OURB on heels*", was based on a one to one investigation process, in which one surveyor tested the possibilities in engaging people with a direct and personal approach, recording information through the help of a digital application. Since the first experiment's pur-

pose is oriented to test the possibilities to engage people through physical devices, the second is testing the affordability and the advantage of using certain media recording application to facilitate the collection of information through different media with the support of technological devices.

OURB on Wheels

During the two sessions of OURB on wheels, the research team was able to involve people in the making of different kind of exercises; in consideration of the findings obtained from the previous research on the ways online platform enhance the participation of public users, the research team tried to transplant some of these findings to shape the method on which the physical engagement exercises were based on, testing certain influencing elements that foster participation, as the trust, the gamification, the anonymity.

The first on field session of OURB on wheels was organized in Brussels, carried out with a van working as a venue to host the practice of the little workshop. While analyzing the results of the experiment it was important to take into account the context in which the work has been carried on: the place picked for the first OURB on wheels' experiment is in a neighborhood in which the diversity of identities and uses of it does not facilitate its definition; its structure, the profile of the inhabitants and the users is very much diverse and the area is known to be a pretty much complex one and rather problematic. Facing a non-easy audience anyways gave us the possibility to get better awareness about certain issues concerning the direct involvement of people and the strength of certain communication approaches. The team invited people to go through 3 different exercises;

- Hands-on mapping
- Collages
- Videotapes

In the first exercise people were asked to approach a big map showing Brussel's central area and some adjacent zones and to indicate their ordinary daily

route with a string, indicating their home as a starting point. A distinction of two colors marked a gender identification. This representation method allowed us to both mark crucial points and paths, creating a sort of rhythm-analysis map of the users of the area. This exercise's aim was to understand what is people's acquaintance with space representation on maps, and to test their capability to orient themselves in the map, reporting data on it.

Second aim of the exercise was to test the potential in the way of gathering information; it's relevant to notice how just a first glimpse on the finalized map gives an impression of how the space is used by the group of people that participated to the exercise. Translating this info into numbers or categorized data, would allow to make an easy study on the average social rhythm of the area, with the possibility to repeat the exercise in order to refer to different periods or space contexts.

The second exercise involved people in making an actual object, producing a collage which could answer the question "what's your ideal place?". Each element given to compose the collage had its own meaning and belonged to a certain category. The participant were free to compose these different pre-settled elements and use them according to their own wills, with addition of personal drawings / writings. The importance of giving pre-set elements is given by two factors: first, for practical reason of feasibility and rapidity; second, having the collages as different outputs based on the same elements, allow to make an accurate analysis of the results .

All the collages are a mix between pre-given elements and additional personal sketches or writings, easy to compare thanks to their monochromatic features and graphic similarities; it's relevant to consider as well the importance of the time that people gave to develop the exercise, as a proof of commitment and engagement.

As mentioned a positive factor of using given element to compose the object allow an easier and more accurate comparison between the outputs produced, but on the other hand it can lead to a lack of

contextualization to the studied context and limit the way of expression (even though we notice that people were able to see different things in the same element). An interesting aspect that we noticed was the tendency of taking inspiration from other's work, like a sort of unconscious influence that tends to happen between participants.

Collages and similar creative experiments were simple yet really evocative output, they can be a way to understand people's values and thought process, surfacing unexpected themes and needs. With the belief that making things is a way to think things through, the exercise is unlocking creativity and making the participants going through a critical thinking process.

Creating amusement while practicing the exercise is recognized to be a way to facilitate the involvement of people, so the playful aspect of the exercise helped to attract more participants. The exercise was easily doable in order to gather the attention of a consistent number of people. This type of exercises were a success thanks to the gamification aspect that has been given to it. Playfulness and fun were two key elements for people engagement. All these practical considerations are important to define what's relevant in the design of an interface, whether digital or physical.

The third exercise developed involved people being videotaped for 30 seconds, time frame they could use to express with their own words what they liked about the area and/or what they would like to change. This type of exercise is a way to collect more direct data from the source, recording them without interfering with the researcher personal filters. It allowed for information to be captured straight from the source. Moreover, giving a time restriction put pressure to the interviewed to give concrete answers and narrow down to the most important information they could provide. Exercises as such were very demanding and can less easily get response from the public. Many participants were not willing to commit enough time to sit and be recorded, even though mentioning the very short length of the exercise is

still a way to stimulate the engagement. Through the exercise the issue of trust was explored. Few people allow to be recorded, since the idea of letting personal images to be recorded can be seen as interference with personal rights.

In consideration of these findings, the research team partially reviewed the way of developing the exercises for the second event of OURB on Wheels. Overall, the goal of this second experiment was to test out how our exercises could work in a different context in order to support the idea that the exercises could be reproduced at different locations and settings.

The experiment was set out in another hyper diverse area, this time in Antwerp, but since embedded in an event organized by the municipality a lot of the crowd that showed up had already interested in participating. This time we didn't have to surprisingly invite people from the street but instead the participants that came were already interested in the event. The majority of these people are mostly highly motivated community members, that can be referred as the "believers", people that will be the first to help and make something happen in the neighborhood. We could say that gender equality was better represented however diversity was less evident. After a count, we could establish we had 21 participants in our experiments.

This time, participants were again asked to explain their daily path, and with this exercise we were able to again start a conversation and find out a generic how inhabitants transit through the neighborhoods. This time people had an easier time figuring out their path, and so it was an easy exercise for them to partake. We would establish that everyone could find their way within half a minute. Overall we established as well that this already gave a good conversation starter that could lead to a second experiment. This exercises were accompanied with a newly introduced part which consisted of a chart giving to people the possibility to pick, through a small critical process, possible architectural development solution for the future of the neighborhood. Four spots

with high potential for development were selected and the participants were asked to make considerations on space, safety, health or livability, to then select one of the site in which they would propose a project.

It can be argued that the exercises could have been visually organized in a more simple manner and could have given more options. Although most of the participants were understanding the point and the visuals. It was also very interesting to see how the inhabitants learned about their environment from the exercise.

It's important to acknowledge the context in which the experiment was conducted, and how it affected the kind of people that took part and the amount of time they spent engaged. The fact the experiment was part of an organized public event meant that the citizens that chose to come were already motivated to participate and therefore the downside from this was that only people who wanted participate in community events were reached, which left a lot of people out of the conversation.

OURB on Heels

The goal of the experiment called OURB on heels was to explore the usage of an ICT platform on the field in order understand how online media collection improves the efficiency of a surveyor to collect data about an area, and support the idea that the combination of virtual mapping facilitates the analysis of the urban fabric.

The tool is a mobile data collection platform that allows you to easily build mobile forms & collect data anywhere, at anytime. The most interesting aspect of this platform for Ourb on heels is the location-based data collection. This feature allowed the surveyor to automatically map out the collected information easily and efficiently in one place while exploring the area. Main features tested were: Digital location based mapping, Audio interviews, Photo capturing, Sound capturing, Video capturing.

Loose conversational interviews were conducted and in order to engage the different subjects into conversation, the surveyor had to identify himself and ask for permission to record the conversation, proceeding then to record on phone, asking questions and turning it into a casual conversation. When the conversation was done, some comments have been written down and saved on the digital cloud together with the location where the interviews were held.

Audio recording interviews were very welcomed by the interviewees and easy to perform on field. The location-based mapping of the information was also very useful and easy to navigate and locate our interview. The recording allowed to gather first source info, as it is not filtered through the researcher understanding of the conversation. The researchers were able to prove that the location based data storing allowed easy organization of data and is useful to navigate through the study area.

Conclusion on the experiments

When comparing how we established participation in our 'physical' experiments, and how it is established on online platforms we can state that the critical factors remain the same. **Trust** is the first critical factor we need to establish. When asking people to answer anonymous to the questions no one hesitates, but when asking if we could film them, not many were eager to respond. With the people who were willing to be filmed, we had a preliminary interview to built up trust. Explaining them we are students translated in an active attitude, willing to participate in our experiments. Another determining factor was the **number of people** who were participating in our experiment. We showed the outcome of other participants by making their answers visible on the street. It drew passerby's' attention and made them curious. Seeing how many people responded to our questions lowered the participate barrier. We can argue the same for online platforms, the quantity of members of a platform reassures other non member that the platform is trustworthy. The Trust-profiles used on online platforms is a variant of the

preliminary interviews we had to built up trust. However online this can happen more efficient, trust profiles are built by accumulating feedback from multiple interaction with different users. We gamified our experiment to motivate the citizens to participate. Important is that these tasks were simple, clear and generated fast answers. We noticed that **participants seek validation** the same way they do online, they compare their collages and answers to other participants, and saw this leading towards discussions, soon they started to address other issues, this shows that gamified experiments are a good trigger to discuss urban issues.

CONCLUSIONS

The research group concluded that this paper attests only for the beginning of a comprehensive research, one where we dive even deeper in studying how we can harvest collective ingenuity through different ways of participation methods, physical and digital, to then facilitate the process of designing, increase engagement of all stakeholders and thus building a more democratic way of developing a city. This part of the research is a good starting point to set the next tone on which we will tackle the next phase for the developing of OURB, as we hope to further its development to the implementation of a digital platform and the continuance of the on-field experiments.

Having tested the theory through the experiments, the team strongly believes in the power of a combination between working through ICT tools and developing a work on field, acknowledging that the potentials of one approach can compensate the limitations of the other. As showed in the previous considerations, this collaboration has been helpful to enrich the research method as well; the analysis of several online platforms taught us the value of elements such trust and gamification, criteria that have built the shape of the experiments conducted. It can be concluded that **trust** depended on the amount of commitment the user had to give to each of the exercise, the feasibility of knowing what to expect, and the spatial context on which they stand.

Then **gamification** was indeed one of our major key factors to achieve the participant's engagement. Through gamification of the inquired information became easy to extract, but it also gave way an alternative tool of communication. Gamifying means to make it fun for the user to give the data we needed to understand their point of view of each requested area, and indicated certain concerns, they could not communicate immediately. The exercises gave time for more critical opinions to be made as they needed to take some time to think.

Learning from our experiments and the theories for different forms of collective living, we conclude that there is a new mentality change that needs to take place in order to give way to the upcoming currents of collective ingenuity. The new currents, show how it is possible to do less with more and highlights the positive attributes of living through a connected world. The ideas of a world relying on collective ingenuity opens the doors for co-creation, expands on the possibilities of a more resilient city. We can now positively understand that our attitude of moving towards a more inclusive and collective planning system goes along with those of many innovative minds, even though the planning systems currently set, are inadequate and are not processing with this new mentality. We also learned that this new mentality is already taking force on the online communities and exhibiting some good results on harvesting the collective intelligence through different methods.

REFERENCES

- Arnstein, S.R. 2006, 'A ladder of citizen participation', *Journal of the American Institute of Planners*, 34, p. 4
- Commission, E.U. 2000, *The EU compendium of spatial planning systems and policies, Belgium*, Office for Official Publications of the European Communities, Luxembourg
- Kluitenberg, E 2006 'The Network of waves: living and acting in a hybrid space', *Open Platform for art culture and public domain*
- McCullough, M 2005, *Digital ground: Architecture, pervasive computing, and environmental knowing*, The MIT Press

- Newton, C and Pak, B 2015a 'Eversion as a Generative Metaphor for Situating', *Virtual Worlds for Online Learning: Cases and Applications*
- Newton, C and Pak, B 2015b 'Virtuality and Fostering Critical Design Thinking', *Springer International Publishing*, Switzerland
- Pak, B and K, Scheerlinck 2015 'The City As A Commons: Reconceiving Urban Spac', *Common Goods And City Governance*
- Pak, B and Verbeke, J 2014, 'Geoweb 2.0 for Participatory Urban Design: Affordances and Critical Success Factors', *International Journal of Architectural Computing*, 12, pp. 283-305
- Stephan, D 2008, *Space between people, how the virtual changes physical architecture*, Prestel Publishing
- De Waal, M 2010 'New Use of Cellular Networks, The necessity of recognizing the Nuances of privacy', *Open Platform for art culture and public domain*
- De Waal, M 2013, *The city as interface - how new media are changing the city*, NAI Uitgevers/Publishers Stichting, Netherlands
- [1] <http://futurecities.catapult.org.uk/opportunity/prototyping-future-planning/>
- [2] <http://www.eea.europa.eu/publications/global-megatrends-update-4-accelerating>
- [3] <http://www.wave-innovation.com/l-expo.html>
- [4] <https://www.blablacar.com/wp-content/uploads/2016/05/entering-the-trust-age.pdf>
- [5] <http://crowdsourcingweek.com/wp-content/uploads/2016/09/CSW-Europe-2016-Collaborative-Society-White-Paper-.pdf>