

Approach to design practice based on collaborative platforms – Application to bicycle mobility system in Porto

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Abstract

This research aims to create collaborative strategies and operative tools for design practice, applied in an urban sustainable mobility scenario. We find that co-creation platforms encourage an active approach involving the people in the development process leading to effective and holistic solutions. Initially we catalogued tools and collaborative methods based on case studies, to identify and propose new approaches to various project phases, action modes, creation, development, testing and implementation of proposals.

Through action-research methods we want to validate a toolkit applied in developing a bicycle mobility system in Porto (Portugal). Designers, users and stakeholders actively collaborated defining a real context of action, developing and implementing solutions. Started by a bottom-up approach, bringing together groups of city cyclists and sustainable mobility activists, and then the local authorities, the project enabled positive and local impact based on a democratic design approach.

The replicative potential of this action model is a next challenge to various application scenarios.

Introduction

Though it is not recent to have people involved in the design process, by introducing participation in designing of proposals, aiming to reduced or reversed negative impacts of the profession (Cross1971).

However, this kind of engagement has been evolving into new roles, leading everyday people as co-creators (Sanders, 2006), which recognizes creative skills and potential to generate concepts and valid solutions, combining knowledge and experience on the subject or area of intervention.

The perception of collaboration changing patterns (John-Steiner, 2000), are also relevant to mention as a dynamic process. A collaborative process may not be driven by a straight and tight team, but it can be flexible according to the activities, needs and responsibilities defined in the project. Thus meaning, roles and methods can be adapted along the development and the intrinsic needs of the project.

Including and stimulating the collaboration of people with different backgrounds to develop proposals make designers take on new roles and modify or adapt their

design process. There is a need for to an evolution, a learning process from design *for people*, to design *with people* (Sanders, 2006). However, the collaborative design approach is not intended to replace a more traditional methodology but to strategically coexist and to enrich the global project process. Promoting a creative process enhance by culture, people and fields of expertys (Csikzentmihalyi, 1996).

The process of identifying and cataloging tools and methods took into account their potential of: generation, exploration, analysis, communication and implementation of ideas and solutions; in order to facilitate definition of collaborative design sessions plans and the type of intervention in different project phases. This proposal comes from the identification of four stages (Gray, Brown and Macanujo, 2010) and evolves to *opening, exploring, defining & deciding* and *closing*, that tends to take place in parallel and interacting with a traditional design process. The tools and methods can be chosen by their objectives: number of participants, time available and according with the communication skills of the group. This strategy is grounded on tools that enhance communication and visual organization of information, giving theo participants tools to support and to construct visual concepts and ideas.

By doing this the researcher has the objective to explore the development and structuring of co-design sessions. Understanding the potential and suitability of tools and methods to the various design process phases. By applying this he seeks to facilitate a process of communication and expression of the participants to develop a working support for more holistic and appropriate solutions.

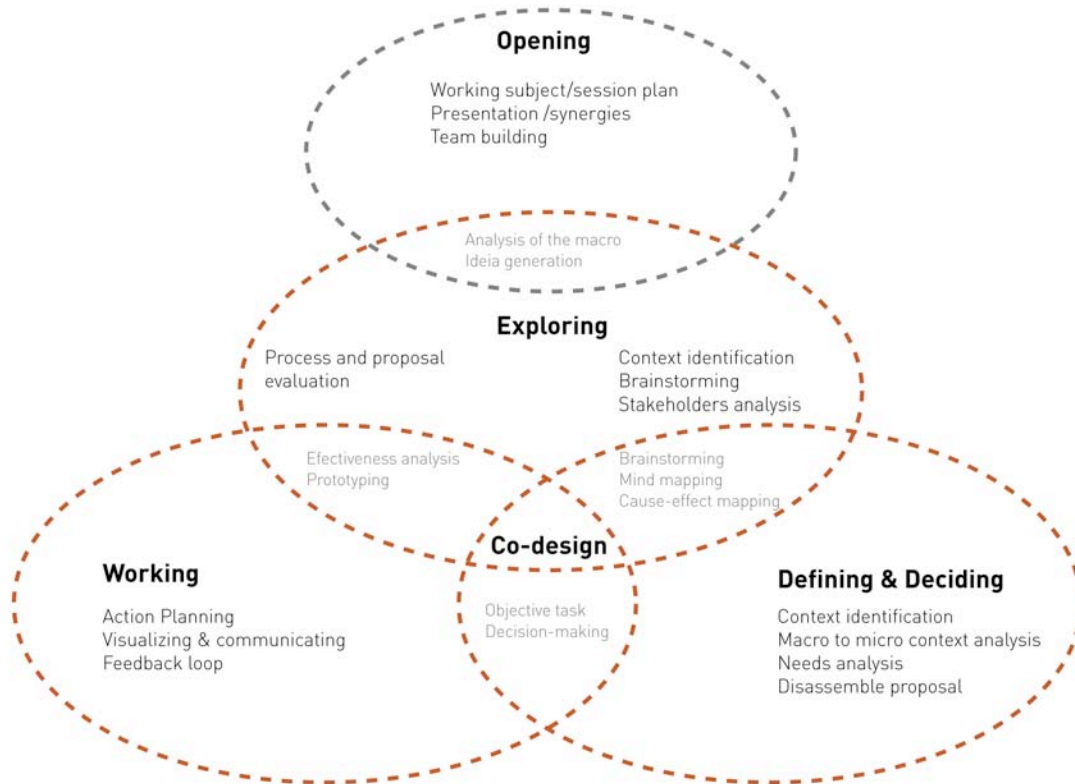
The challenge of developing proposals for an urban mobility based on the bicycle for the city of Porto (Portugal), intends to increase the number of solutions and infrastructures to support emerging groups of urban cyclists. The resistance to change and the topographical features of this hilly city are some alluring causes and more difficult to solve.

While it still a work in progress this project can be defined as a laboratory for studying, refining and exploring tools and strategies for co-design.

Identifying tools

The goal to identify and propose a process of cataloging tools and methods, that facilitate and support co-design has become essential in defining and structuring working sessions. The structure and adequacy of a session plan comes from various quarters, related to the context of action (public or private) and the developers (designers or non designers) (Fuad-Luke, 2009). In parallel, the intervention or insertion of co-design approaches can be considered in several project development phases. However, the importance of the initial phase, the *fuzzy front-end* (Sanders & Stappers, 2008), is a crucial moment for context defining, when we can identify the real context of action and realization of a brief that clearly points out the subject of work.

By identifying four different moments in the work sessions, these tools have the objective to facilitate and enhance the creative process, generating ideas, exploring and analyzing data and proposals, as well as the preparation and decision-making, prototype analysis and other types of materialization of the proposal.



1. Framework for cataloging methods and tools to facilitate the co-design sessions. Based on Alaister Fuad-Luke (2009)

Each of the four moments were sub-divided into several moments that have been defined by objectives/outputs of the tools and methods, either directly identified by the core purpose, and the transition moment. This conceptual framework for organizing tools and methods, showed in image 1, is based on the Fuad-Luke's proposal. Because the transition moments are important to increase and promote work fluidly, the author chose to maintain this.

Opening moment

Tools and methods for logon, for the opening of the working session were designed with the aim to: communicate the work plan and contents; introduction and development of synergies between participants; exercises for "warming-up" oriented to the methodology to be applied; analysis of the macro context; generation of preliminary ideas.

Opening	Tools and methods	Number people	Time (min.)	Output
work plan presentation and conceptual framework	Visual agenda Pecha Kucha		10-30 6.6	Visual + words Visual
Team presentation	Trading cards Welcome to my world	unlimited 8-20 P	10-15 30-60	Visual + words Visual + words
Warm-up	Graphic jam	5-15 P	30-60	Visual
Context analysis	Draw the problem Show and tell	6-10 P 5-15 P	20-30 20-45	Visual Visual + words
Idea generation	Brainwriting	5-15 P	30-45	Words

2. Example of some tools and methods that have been identified

Exploring moment

Tools and methods to stimulate and facilitate focusing skills, context identifying and working that aims to: generation of ideas; redefinition of context (macro to medium or micro), analysis of proposals and contexts definition, conflict management, preparation for decision making and team motivation;

Defining & deciding moment

Tools and methods to create analytical moments for solutions dissection and definition. A moment that provides decision proposals and solution test or implementation that aims to: performance evaluation of tasks and work methodology; prioritization (qualitative, quantitative and vote); conflict management; analysis of future scenarios; schedule and definition of tasks and teams;

Working moment

Tools and methods to conclude, closing session, through communication and demonstration of proposal validity, as well as to promote discussion and analysis that aims to: generate supports for presentation and communication of the final proposal; testing prototypes or something tangible; generate and facilitate an informal discussion.

As it's possible to see in image 2 the cataloging process of tools and methods is based on the following factors: identification to the appropriate moment of the session, time for the task, number of elements required and type result or output (word, visual and words+visual).

Building a community

The increasing growth given to the use of bicycle as a mean of transport in the city of Porto (Portugal), is based not only in economic reasons, but also in the increasing awareness of citizens in environmental and social issues. This movement has been present in local initiatives as well on the internet, on personal blogs or websites of organized movements (some implemented worldwide). In the absence of any effective plan to encourage and support bicycle commuting in the city by the local government, a project that aimed to facilitate urban cycling mobility for the city was initiated. Initially, the researcher, as a designer and an urban cyclist identified and came into contact of a blog from Miguel Barbot that

was starting to record testimonies. After several contacts and and after some informal meetings it was from a small group of six active urban cyclists was unanimously decided to start working on a city cycling map. To promote the success, this proposal should be collaborative, with the involvement of Porto's urban cyclist community, as a *bottom-up* approach.

In October 2010, and using a personal blog (<http://1penoportowordpress.com/>) as a basis form for gathering information and potential collaborators, users testimonies were record and a mapped using pathways in google maps. Through this and other two blogs, facebook groups and various events held in the city, it was possible not only to gain the interest of other cyclists, but also the media.

The researcher would like to emphasize the some group members were invited to appear in local and national media, as well the contact initiated by the municipal power who demonstrated interest in the initiative and potential to develop the project.

In November 2011, and with 48 testimonies (reporting of experiences and mapping pathways) the city areas with significant cyclist traffic became apparent and it was possible to measure the average distance of daily journeys (10.8 km/day).

Based on the overall map a simplification was made that aimed to unite the various parts of the city, avoiding routes with considerable sloped streets. In this document it is possible select paths with low inclination grade and less effort. These simplified routes were based on testimonies and tested and analyzed by the project responsables. This information is being worked by a infographic designer that is creating a document, which will be open to public discussion. The aim then is to provide this map freely to users. The map by itself is not an effective catalyst for change, and it was proposed by the researcher to create a second phase of the project through collaborative sessions. Along with urban cyclists we pretend to develop proposals to improve conditions and increase the use of bicycles as a means of transport in the city. The objective is then to extend the team, involving other stakeholders, local government and various experts. By finishing this two project phases, the goal is to present it to the Municipality of Porto, having them as partners in implementing the solutions. Although is seen with good eyes the possibility to implement independent community initiatives or solutions held on the second project phase.

Creating a session plan

Although there have been several contacts with the Municipality of Porto, it was decided that the first work session would involve only collaborators with experience in the use of bicycles in the city.

This decision concerns to two matters: firstly aims to create a direct contact between people of a community that normaly uses the internet as a means of communication; the second is considered that

the initial analysis developed between peers, allows greater consensus and prioritization in order to be more productive than in larger sessions. The first session was publicized on the platforms in which the group was present, in particular facebook group and mailing list (urban cyclists of Portugal, a critical mass of Porto, MUBI, among others) as well as in personal blogs.

Based on the cataloging process of tools and methods to support co-design was a work session planned for 10 elements with an expected duration of 240-270 minutes, taking into account the four defined moments. However, since it was the first session with a short time period, the goal was to promote a dynamic discussion and come up with possible scenarios, we decided to give emphasis to hybrid phases as it can be seen in image 3. That defines diluted barriers between moments of *exploring, defining & deciding and working*, not being the primary objective to present a final and definitive answer.

Moments	Strategy	Output
Opening	Individual team presentation; Brief conceptual synthesis. Approach to co-design and sustainable mobility, case studies; 1st exercise (20 minutes) - prioritization and identification of a context of action macro (social, economic and environmental)	PPT Presentation Bullseye
Opening to exploring	2nd exercise (60 min. Teams of five elements) - Ideas generation and choose four with complete agreement by all elements	Brainstorming post-up
Coffee-break	Selection of one idea by the session facilitator (designer) and the investigator	
Exploring	3rd exercise (30 min. Teams of five elements) - target analysis and exploration of the idea	Empathy maps Concept generation sketchboard
Exploring to defining & deciding	4th exercise (30 min. Teams of five elements) - exploration and analysis of the idea	Squid maps Preliminary scenarios
Defining & deciding to working	5th exercise (40 min. Teams of five elements) - final definition of the proposal	Building scenarios poster and prototypes
Working	6th exercise (30 min. Teams of five elements) - Final proposal presentation and discussion	Poster and prototypes Discussion new data

3. Sessin plan. Identification of moments, strategies and desired outputs.

In this work session, a professional designer was involved, he was instructed to be session leader and animator, to support the working groups through the promotion and development of proposals, facilitating processes and communication, and finally manage possible conflicts and facilitate the decision-making process. The researcher was present in the session as an observer.

The team was consciously made up of people with various professional backgrounds, different ages, gender and diverse uses of the bike.

For this team were made available several materials (markers, post-its and A1 paper format, A1 physical templates for working, glues, etc.) as supports for creation. For scenarios construction, we created a toolkit with cutouts of film characters, with different users and types of use made of the bike, as well as a set of elements of signage to be introduced at the decision stage and defining the final proposal. Another issue that has been defined was that each work group started from the same basic idea, but worked for different target/public: young people (targeted for children up to young adults) and an audience of more advanced age (adults to seniors).

Getting the job done

At the beginning of the session the collaborators presented themselves since most of them had no previous direct contact. At this time it was possible to understand what there were differences between them in several issues as educational training, professional activity, as well as the motivation for participation in this event. Next, a framework presentation to co-design and to the session plan was made, this proved to be quite effective in clarifying and facilitating the relationship between the participants and the team itself. By introducing case studies (MO. Mobility for Tomorrow and Switzerland Mobility) with different approaches and methodologies with good results, it was possible to introduce several thematic focuses as: the bicycle use as a means of daily transport and the use of it at holiday or leisure activities. The route map developed by the group was made available to be used as a possible aid to the work session.

The first exercise was the bullseye tool (image 4 in the left), used to identify and prioritize values and concerns at economic, environmental and social levels. This was developed by the group in order to create empathy between the participants and make room for some discussion.

The challenge was to stand out and define a hierarchical setup between issues that they deemed important to enhance urban mobility based on the bicycles. As the result of this exercise we can highlight:

Economy - low-cost of a possible service, easy and affordable access to bicycle, for example through sponsorship.

Social - indiscriminate access to all, as the access to reliable maps and routes, creation of free car zones, boosting the use of public transport, the adoption of sustainable behavior and preservation of the characteristics of the city were reported as important factors on the environment level. Less important to the participants, and therefore placed in the outer zone of the chart, we highlight the car sharing in the economic level, the prevention of bicycle theft at the social level.

Environmental - reduction of carbon dioxide, decrease of noise ratio and bike lanes.

It is clear that the relationship of tourism with the creation of a mobility system,

has not created consensus among the group. Tourism in the city has been growing proven by great economic development. Despite this this relevant public, the participants focused mainly on solutions for city residents and workers who walk every day through the streets of Porto, rather than on tourists.



4. Examples of several exercises results

The exercise showed good acceptance by the whole group and it was observed the importance given by the participants of the enrichment analysis given by from different personal perspectives.

The second exercise's goal is to generate and explore ideas, to fulfill this aim a brainstorming session was used (image 4 in the center). The participants were asked to freely form two teams with the same number of elements. In order to focus on the subject of analysis, it was suggested to generate ideas that would facilitate and increase cycling in the city of Porto. In this exercise the need for mediation by the animator was evident, to introduce issues or problems inherent to the city and thematic work. This intervention was more evident and intense in the initial phase (first 10 minutes) and at the final stages, supporting various opposed views and selection of three final proposals. In the end some significant proposals were achieved: free access to cultural events as recognition of cycling; the exchange of kilometers by gender, support and supervision services of children on their journeys from home to school, extra money support/subsidization for workers that use the bicycle as a means of transport and the analysis of the city streets direction in order to improve paths, etc. Thereafter a coffee break took place when the designer and the researcher had chosen a proposal that interpreted the bicycle as an asset for social equity and revitalization as the idea to work by presenting a wider developmental potential. This idea is attached to the concept of a system that encourages the use of bicycles but with a relevant social and economic role in the city.

The designer started the second phase of the session by presenting the selected idea, which could include suggestions previously advanced, if such a need was identified. All developed supports were always present for consultation and analysis during this session.

At the *exploring* moment and in this particular session, the use of empathy maps (image 4 on the right) was intended to support the work teams in defining more precisely the public and target of their proposal. In this exercise it was interesting to note the voluntary role-playing by a group member to play one of the

characters, answering questions from other elements. Then, by observation the other group decided to use the same strategy and a more relaxed was created.

With the momentum being created, a support was introduced, a toolkit composed of different film characters with bicycles, signage and a map of the city underground, in order to facilitate discussion and materialization of the concepts. This measure aimed to encourage a shift from a predominantly form of written and oral communication to a more graphic one.

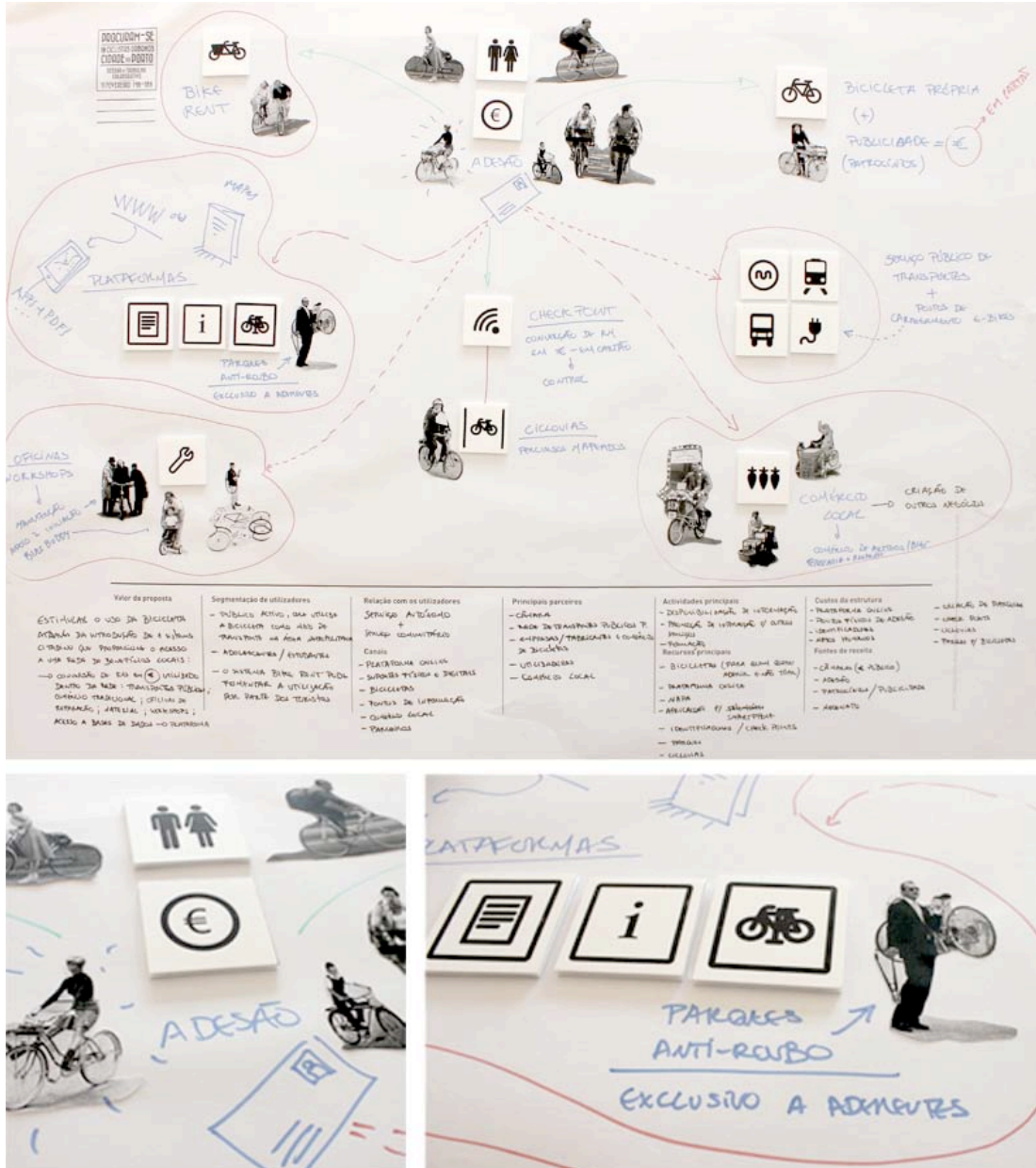


5. Experimental toolkit in action

The use made of the toolkit by both teams was interesting since they took it like a game where they could easily simulate characters and daily city situations. In this phase it was observed the creation of preliminary scenarios, very close to the reality of the actors but also equally flexible since it were under construction. At this time, the intervention of the designer/ animator became more punctual, in raising questions that support and improve the analysis of some created situations.

At the transition from *exploring* to *defining & deciding* moments, it was proposed to create a squid map of the generated idea in order to evaluate and identify potential strengths to improve or address questions that have not yet been definitely answer. In this exercise, the intervention of the designer/ animator aimed to foster synthesis and analysis of points and areas present in the *business model canvas*. This guidance aimed to facilitate the transition to a final exercise, the materialization of a poster to communicate the final proposal.

At this stage, it was started the fifth session moment, which aimed to create an idea communication support. The presence of the animator was punctual and most often requested by teams themselves. These interpolations mainly aimed to support and validate the effectiveness of the means used to communicate the idea. Due to the toolkit, the teams showed more independence and some ease in the materialization of the final exercise.



6. Example of a poster made for proposal presentation

The presentation and discussion was very productive, the interaction between teams confronting solutions was noticeable, some of which were complementary. The creation of information (such as maps and basic advice for beginners in bike commuting) was common, but with proposals that differed in the media used. For a younger audience these were based on online media, while that for a more

senior and child audience the use of more effective printed media was considered. Another common point was the creation of bike lanes on main routes that could be proposed to the town of Porto. Low-cost interventions, such as pointing out the road area reserved to bicycles, and others with higher cost as the creation of more bicycle parks, some of which could be closed and near major subway and train stations. At this point, the definition of a route map was taken as a major issue. There were some interesting proposals that aim to create a system, based on an online platform where user can benefit from discounts in local shops. The user should be registered and could redeem points converted into cash in card for use in the system itself. In this system partnerships can be developed, which act socially introducing a bike sharing, bike renting or bike donation program. A major difficulty will be the creation of a real bicycle use monitoring systems as a way to validate and grant access to the benefits offered.

At the end of the session, the participants proposed the introduction of some of these tools and methods in coffee meetings that usually take place at the end of a workday, before or after a bike ride through the city. Through this strategy, participants find it easier to involve more urban cyclists, increasing the sample, dissemination and collaboration in the project. Accordingly, before moving on to greater involvement with local government it was decided to explore and refine more suggestions to build a greater strength to the project. The participants noted that was time for the exploration and production of ideas and also considered that the session could be split into several sessions.

Conclusions

In this study, we examined tools and methods to facilitate co-design work session and we organize them by several moments that were sub-divided making correspondences between their aims and their outputs. As a vehicle to test them we integrate a working progress project for urban cycling mobility for Porto city. The goal of this study was to understand the reactions of the team to plan session exercises and moments, to developed a organization and parallelism between co-design tools and methods and design project approaches.

The informal process of community and team building made us realize the importance to involve truly motivated people due to long term working agenda. The relevance of developing approaches and initiatives similar to the reported, despite being a work in progress, are assumed to have a strong potential in terms of social value. The involvement of citizens on their own initiative, follows a personal satisfaction, this facilitates the adoption of active citizenship models and seek solutions among peers. However, it is assumed that the extinction of the design profession by including people into the project process is not a reality. A clear action of designers as facilitators and possible co-actors in the creative process only broadens its spectrum of action.

The creation of a database to support expression and idea communication, like the toolkit used, can enhanced the communication process of the collaborators which in turn brings to the project an intellectual capital that under a traditional project

approach would not be taken into account or simply filtered and misinterpreted by intermediaries.

There will be new session, as it was suggest to compare with overall results. In a future phase with a more concrete and consolidated proposal the group aims to present the project to the local government, thus increasing their involvement.

The need to adjust or improve catalogue database became evident, considering the development of the project. Due to the project evolution, the collaboration pattern should be ajust due to the growing number of collaborators. To assure the success of the project we must maintain the city cyclist significance, due to the increased number of different actors involved and their influence on the outcome, i.e. (local authorities, companies, specialist and others stakeholders).

Synthesize a document or platform to support co-design sessions and project development in the future can be seen as a positive approach to the present study. In which could be introduced tools that are not so close to a altruistic subject but that take into account initiatives with commercial purposes.

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