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RETROACTIVE RESEARCH IN ARCHITECTURE

SELECTED ARTICLES

ELABORATE TOPICS AND DISCUSSIONS THAT EMERGED DURING THE 9th
EURAU CONGRESS ON ARCHITECTURE'S CAPACITY TO CHALLENGE AND
EXTEND THE LIMITS OF OTHER DISCIPLINES

ALICANTE 19/20/21 SEPTEMBER 2018

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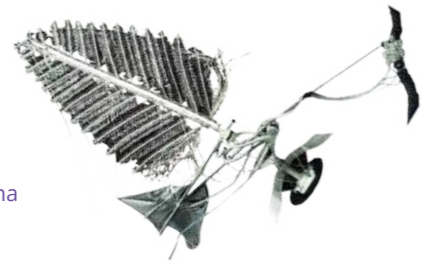## ALICANTE

retroactive**research**
ARCHITECTURE'S CAPACITY TO CHALLENGE AND
EXTEND THE LIMITS OF OTHER DISCIPLINES

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RETROACTIVE RESEARCH IN ARCHITECTURE

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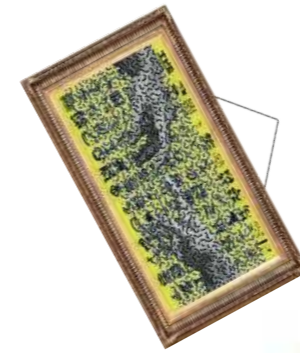Gülsün Sağlamer
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To learn more about the projects:
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TOPICS:

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New Retroactive Topics.

For EURAU.

EURAU is by now a well-known acronym; it is a network made up of researchers, architects, and urban planners, who act within cultural institutions and universities.

**But not only this; it is an open community, that grows, expands and branches without closing into narrow institutional and disciplinary enclosures.
It is a place where comparisons can be made between individuals who reflect upon the future of architecture, of the city, of the landscape, within the framework of a European context. This encounter happens every two years, and these participating individuals are perhaps an example of the "community**

that happens", of which the Italian philosopher Giorgio Agamben spoke in his book "La comunitàcheviene." EURAU was born in France, but in a north-western Mediterranean city, Marseille, way back in 2004. Founded by an architect from Algeria, Farid Ameziane, as a powerful expression of the plurality of cultural horizons, very well expressed by his North African eyes. The EURAU community owes him a lot; we have lost him too soon, but we don't forget him.

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Constantin Spiridonidis, the Greek coordinator of the European Network of Head of Schools of Architecture (ENSHA), invented EURAU together with Farid, thus symbolically affirming the other pole, the south-eastern Mediterranean one, which constitutes the geographical horizon of the research network: an open horizon; European but not Euro-centric that also looks towards the South of the world.

European Research in Architecture and Urbanism: the Mediterranean French language immediately included the English language, to be opened more towards an international dimension. From the very beginning, the first edition in Marseille, dedicated to the "recherche doctorale / doctoral research", it was clear that the congress aimed at challenging- with the most advanced expressions of research– fixed ideas on architecture, on the city, and on landscape.

The first three editions took place annually. Lille hosted EURAU in 2005, a small city that had become the European symbol of a new idea of"centrality" based on the railway network. And it has been here that the relationship between the host city and the theme of the congress began to become a "must": in this edition the topic was the "Large Scale."

In 2006, in Brussels, the geometric and geographical centre of the united Europe, the theme was "Heritage", the word that most of all could represent the cultural horizon of the European world.

EURAU grew from one edition to the next, and the organizational commitment became more complex. It became impossible to organize it in a single year. Better to meet every two years, and to extract, from previous experiences, a first hypothesis for the "format"; the leaders of the previous editions became the members of the organizing committee of the following editions and addressed the "process" that has to be followed in order to organize the congress in a different city.

In 2008 it was the turn of Madrid; Joaquín Ibáñez, with Darío Gazapo and Miguel Ángel Aníbarro, formed part of a research group of the ETSAM to focus on the topic of "Cultural landscapes." The network has expanded and strengthened;

hundreds of researchers met in Madrid with many of them becoming "serial" participants of the EURAU congresses.

In 2010, Naples was chosen, the "città-mondo / city as a world", suspended between hell and paradise, where EURAU explored the Vitruvian theme "Venustas", this time not only to "contemplate it", but also to "relate" to it. And not only to consider the architecture that pursues it, but also the market that undermines it and the democracy that exposes it.

And then EURAU arrived in Porto in 2012, the city that is also a symbol of a School of Architecture that has made Portugal a centre of a disciplinary culture, where the theme was "Public space", conceived in a non-bureaucratic but in more "geographical" terms. Architecture and urban planning are now moving into a new dimension, which is one considered more broadly as "landscape."

To move forward to 2014, when EURAU took a leap towards a new territorial location positioned on the eastern edge where Europe and Asia touch, merging in the extraordinary setting of Istanbul. The "Composite City" was the topic, and being here, it couldn't be any other one.

In 2016, EURAU entered an Eastern European country for the first time; "beyond the curtain", in the city of Bucharest, where modern architecture has left important and contradictory signs. "In between scales" was the theme, which, in this context, dwelton many different meanings, and touched upon all the layers that the concept of "scale" can encounter.

At this point, having reached the eighth edition, I have to deal with the issue of "gender" equality: the first four congresses took place in a masculine universe, although evidently open, tolerant and rich in female collaborations. From then on four women coordinated the editions of EURAU: myself, first, in Naples, with the generous male collaboration of Marco Trisciuoglio and Emanuele Carreri (and perhaps for this reason I earned the title of "mother" of EURAU, with a place of honour next to Farid, recognized by all as the "great father"), Maria Madalena Pinto da Silva

in Porto, Gülsün Sağlamer in Istanbul, and Beatrice Jöger in Bucharest (with the gentle accompaniment of an enlightened headmaster, Zeno Bogdănescu). With the eighth edition we drew up the accounts; you can believe me if I write that it is entirely accidental this happened. But it is a good sign for a European network that is built not to "catch fish" but to expand, creating knots and knitting together, without impediments, constraints and discrimination.

And then we arrived in Alicante: Javier Sánchez Merina is the first of a new generation of congress "coordinators." He didn't choose to deal with it because he knew some of the organizers. He chose to deal with it because he knew the acronym EURAU and because he knew that the network has been built around it. And also, because he knew that behind this acronym there was an idea of open and plural architectural culture. A culture that wants to put education, research and design actions in a contemporary dimension at the centre of the discourse on architecture that forces this activity to respond to new and difficult questions. That wants to question the relationship between research and "professional" activity in the complex contemporary condition. That wants to offer to the young researchers a place of comparison and a chance to network with so many "others", or even just some "others."

To be actively involved in this network, which is constantly expanding and questioning the reasons for its existence, Javier has chosen a theme of extraordinary importance. To talk about "Retroactive Research" means to hold together Benjamin's Angel of History, the third culture introduced by C. P. Snow, the circular economy. And, above all, to link the idea of scientific research to a knowledge that does not follow linear paths: a knowledge that knows how to play by exploring side roads; a knowledge used to confront single and singular problems that do not correspond to pre- established models; a knowledge that in order to solve these problems, must have the courage to build new "hypotheses." The architect's knowledge: the material with which EURAU continued and will continue to weave its network.

The 9th EURAU Congress.

The French Ministry of Culture initiated EURAU in 2004. Since then, a series of international congresses, or editions, have taken place and now, with the participation of hundreds of researchers from around the world, the momentum has become impossible to stop. The series organized by different Schools of Architecture have been centred discussions around the following themes:

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1st/ 2004
École Nationale Supérieure d'Architecture de Marseille.
On Doctoral Research.

2nd/ 2005
École Nationale Supérieure d'Architecture et Paysage de Lille.
Large Scale.

3rd/ 2006
Association des Instituts Supérieurs Brussels-Liège-Mons.
Cultural Heritage.

4th/ 2008
Escuela Superior de Arquitectura Universidad Politécnica de Madrid.
Cultural Landscape.

5th/ 2010
Facoltà di Architettura dell'Università degli Studi di Napoli Federico II.
Venustas/Architettura/Mercato/Democrazia.

6th/ 2012
Faculdade de Arquitectura da Universidade do Porto.
Public Space and Contemporary City.

7th/ 2014
Faculty of Architecture of the Istanbul Technical University.
Composite Cities.

8th/ 2016
Ion Mincu University of Architecture and Urban Planning in Bucharest.
In Between Scales.

Topic 01 / Critical Pedagogies.

It refers to those practices that focus on the activation of the critical dimension of learning communities. This is done through multidisciplinary approaches, a use of transgressive methodologies and the consideration of ways of teaching as architectural practices in its own right.

Extending Architecture Practice to Improve Participatory Design.

The learning loop and the atelier methodologies applied at Urban Living Labs in the LOOPER project.

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This paper aims to present how to activate the communities' critical analysis of urban issues by using the learning loop method and the atelier form of architectural study. It shows how by applying these methods to urban living labs can help the community to improve co-design of urban spaces by increasing the knowledge and competences of all stakeholders involved in a participatory process. This helps to teach citizens how to assess the feasibility of their suggestions and to evaluate the impact and the effectiveness of their decisions. The experience here described is fostered in the framework of the LOOPER project, in a pilot case in the south part of Verona. LOOPER is a European project, co-funded under the JPI Urban Europe program. Citizens were invited to work on the particular urban issues of air and noise pollution. In this experiment, citizens learnt how to: create dialogue with policymakers; comprehend all the aspects of urban issues; understand which type of sensors exist to measure urban problems and how to use them; analyse which actions can be applied to urban fabric. This process is supported and was triggered by interdisciplinary research that, starting from architecture, expands to other disciplines such as sociology and information technology and turns on a retroactive research that reverses the experience of architecture atelier inside the co-design activities of the ULLs.

Key words:
Co-Design, **Co-Monitoring**, **Learning Loop**, **Urban Living Labs.**

1. Introduction.

LOOPER (Learning Loops in the Public Realm) is a European Research Project funded under the JPI Urban Europe programme. The aim of the LOOPER project is to build and validate a participatory co-creation methodology based on "learning loops" inside Urban Living Labs (ULLs) of citizens. ULLs, as later better explained, are the application of the Living Labs approach in urban contexts. It aims to create a new way of decision-making which brings together citizens, stakeholders and policymakers to learn iteratively – and afterwards decide – how to address urban challenges. The project, as part of the Europe 2020 strategy, works towards a smart, sustainable and inclusive society.

In the pilot case of Verona – that we describe here as an example – the project focuses on air quality as it is a real and serious problem of the city and also it is a common problem that is increasing in many European cities.[1] Besides the real situation of pollution, another aspect that the research deals with is the awareness, the understanding and the perception that citizens have of it. In fact, what people perceive does not always correspond to the real situation: researches demonstrated how perception is usually distorted by social rank, neighbourhood conditions, presence or absence of greenspaces, and educational level.[2] The difference found between the real situation and the perception when talking about air quality is frequently heightened by the communication problems that can be found between citizens and policy makers.
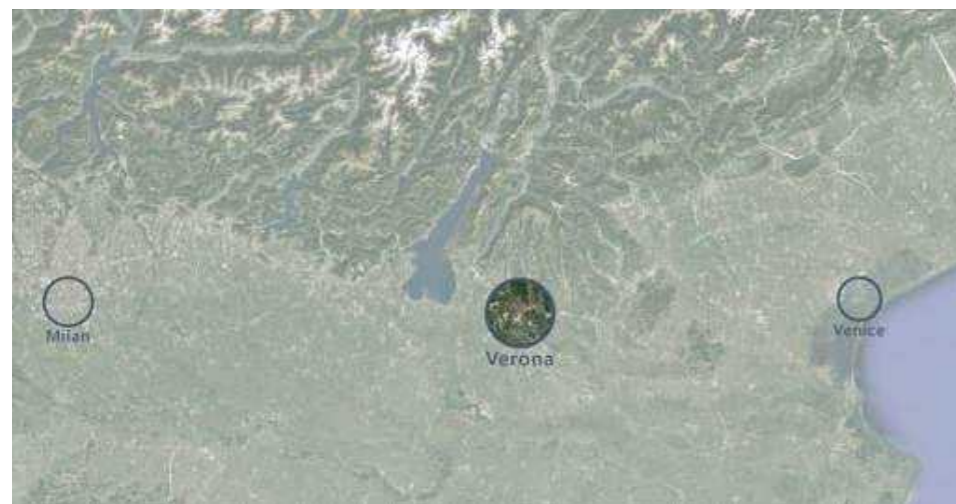
The different perception of problems and the lack of knowledge sharing influence the results of participatory processes. For this reason, the project wants to approach at the same time, inside the participatory Living Labs, both the opportunity of finding solutions to solve urban issues and the reaching of community learning.

2. The problem of knowledge transfer and reuse inside co-design processes.

We can compare Urban Living Labs (ULLs) to design ateliers within architectural schools, where groups of students work on architectural or urban projects under the supervision of their teachers. In the same way, in the Urban Living Labs, groups of citizens work on urban issues under the guidance of experts.

Of course, the objective of the ULL is to find shared and accepted solutions to solve urban issues, and not to train citizens to solve design problems or teach them architectural design. Nevertheless, training citizens on how to approach and solve urban issues is fundamental in order to gain the best possible results.

This need for instruction and knowledge, moreover, is relevant when the topic of the ULL refers to aspects belonging to the discipline of architecture and urban issues. In fact, as is well known, "architecture is a complex discipline, where technical and artistic knowledge blend, and influence each other. Due to this double influence, it happens that there is not an 'exact' and 'unique' solution to architectural design problems. Therefore, the architect, developing her project, has to remember, compare, choose and re-elaborate, a large stock of possible solutions, to move towards the final outcome step by step." (Stefaner et al., 2007)

In fact, the production of several and various solutions and alternatives is not really a problem of the ULLs; on the contrary, inside each session of work a lot of knowledge is produced. The problem is that this amount of knowledge is not shared among all participants and is not passed down to the different Labs sessions. This aspect is also common in design ateliers of architectural schools, where "a big amount of learning is entrusted to practical exercises conducted with various methods and instruments according to the discipline, characterized by the constant commitment of large amounts of time and energy to every single student to develop his/her personal, individual and specific preparation. Such an accumulation of didactic experience generally gets burnt into the training of only a single student." (Spigai, Condotta e Stefanelli, 2006)

This absence of knowledge storage and transfer, and therefore the impossibility for citizens working in the Urban Living Labs to compare, re-elaborate and verify a large stock of possible solutions, is one of the causes of poor success in ULLs outcomes. Often the projects and the ideas generated inside ULLs are not appropriate and unsuitable for implementation in the city. It is because they are created inside a process which is not supported by a learning process: the results are superficial ideas or complex and unrealistic projects; or out-of-date solutions.

To enhance and make effective the outcomes of the Urban Living Labs, it is therefore necessary to capitalize the knowledge produced inside the Labs and reuse it to create new learning opportunities. The use of Information Technology and e-learning tools increased the possibility of classifying and storing the knowledge produced inside didactic Labs. Nowadays digital repositories of Learning Objects[3] that organize the knowledge using advanced taxonomies or ontologies are "evolving from a pure multimedia tool to a new didactic opportunity for academic life, an incubator and a generator of new knowledge, written on the basis of old knowledge quanta." (Bogani, Condotta e Arlati, 2011)

The use of IT tools to "store" the solutions, the ideas, the suggestions, and any other output is a common practice, not only for didactic ateliers but also for Urban Living Labs. In the LOOPER project too, we use different IT tools to collect data about the urban problems, visualize information and to share ideas. The improvement that we are testing in our project, is to include the knowledge capitalization strategy inside a "multi-level" and "multi-temporal" learning process with the purpose of enhancing community learning to improve co-design of urban areas.

2.1. Urban living labs and the learning loop.

Before explaining the methodology of the LOOPER project, this section introduces and explain what we intend for Urban Living Labs and for Learning Loop, as these are at the base of the project

An Urban Living Lab is a new model for experimental design and innovation at urban and community level. It is an open innovative system based on a systematic approach of co-creation with the users within public-private-citizen partnerships. This integrates research and community participation processes in real environments. It can address practical problems such as air quality, road safety, noise, crime or greenspace.
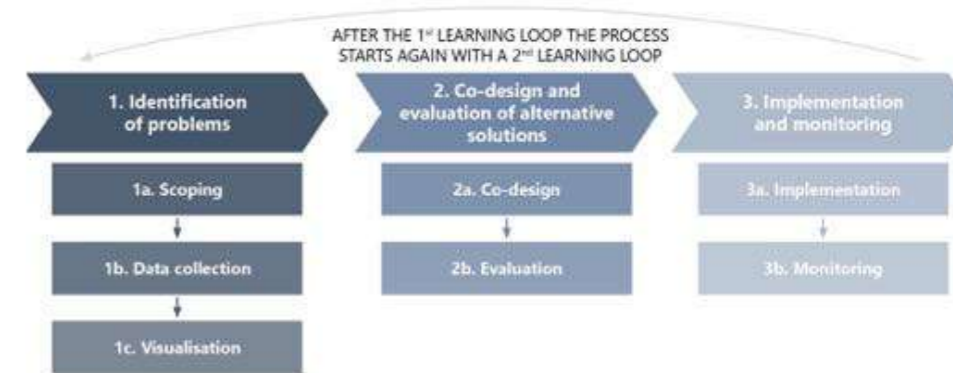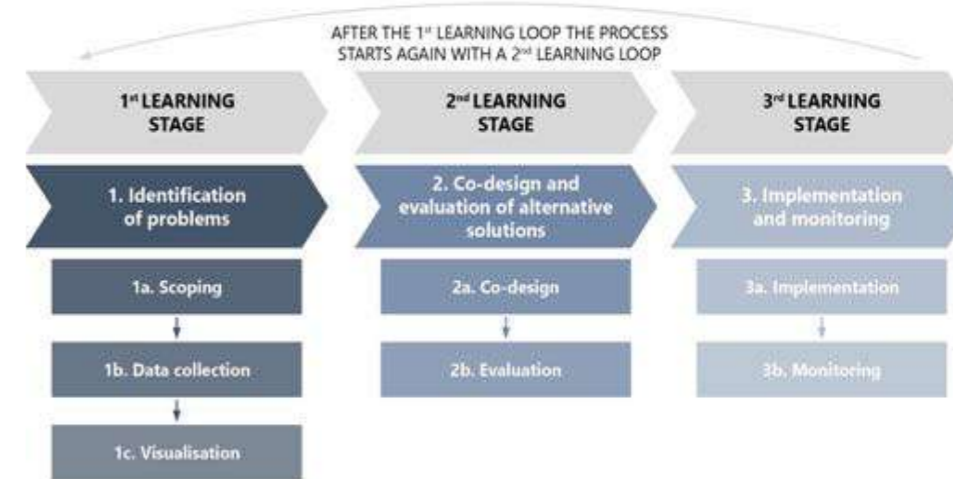
The Learning Loop is a cycle which transforms information into knowledge and then knowledge into learning. The learning is then used to support the production of design solutions that are implemented in the city where they become action. If these implemented solutions are monitored and their effects evaluated, this new information is transformed into feedback and again into new knowledge. This works with citizens and communities, and with policy-makers and other stakeholders.

2.2. The LOOPER project and the Verona case study.

This case study is applied at the Verona neighbourhoods of Borgo Roma and Golosine-Santa Lucia, situated in the south part of the city (Fig.1) which became established and developed as an Industrial Agricultural Zone. This led to rapid growth of two residential zones on the edges of this large area. The neighbourhood is clearly separated from the historic city by the railway infrastructure, while an important road connecting the highway with the old town divides the neighbourhood into two residential parts without a real urban centre.

3. Methodology.

The concept of the LOOPER project is to apply the methodology of the Learning Loop inside Urban Living labs. Each loop comprises three sequential stages conducted inside ULLs (Fig.2): Identification of problems; Co-design; Implementation and monitoring. This three-stage process will be conducted twice in order to trigger a learning loop. Furthermore, the LOOPER project brings three "learning stages" inside ULLs, which will take place during each one of the two Learning Loops. (Fig.3)

Fig.2

Fig.3

Fig.1

Fig.4

Fig.5

Fig.6

The first learning stage creates awareness of urban issues and the status of problems through some acknowledgment and observation activities. The first focuses on the scoping of issues done during ULLs meetings organized with stakeholders. Here citizens can learn what others perceive as issues, and which matters are deemed to be real or not and which are most relevant. Following this, data collection begins using a crowd-sensing approach (also called co-monitoring). This can be done by asking citizens to combine the issues they found with the identification of places to be monitored and with the consequent positions of air quality sensors.

As soon as this co-monitoring is ended, in the visualization step stakeholders are asked to analyse the information that they collected. An interactive web-based platform, developed inside the project, makes visible the results of data gathered during crowd-sensing and makes explicit the air quality of the city.

The second learning stage covers the activities of co-design and evaluation of urban mitigation measures. During the co-design, citizens propose possible solutions to solve urban issues and, at the same time, open a round table discussion between them and the policymakers to define which of the proposed solutions are feasible, effective and sustainable. During the evaluation activity each proposed solution is assessed using a Multi Actor Multi Criteria methodology in a process that involves citizens, policymaker-stakeholders and experts.

In the third learning stage the selected solutions are then implemented in the city, and the results are monitored with a second crowd-sensing campaign. Here citizens, but also Public Administration, assess the results of their activities and increase their knowledge of possible solutions to urban issues. From this point, the whole process is repeated creating a second loop that learns from the first one.

The co-design process based on ULLs and on the learning loop, which is proposed by the LOOPER project, has also the intention, or pedagogical ambition, of transforming any negative feeling of anger and protest from citizens into positive energies of proposition and participation. This process is important because most negative feelings towards policymakers creates resistance in citizens which leads to an inertia towards improvement measures proposed by public administrations.[4]

3.1. The different stages of the LOOPER methodology applied to the case of Verona.

3.1.1. First Stage: identification of problems.

The general aim of the first stage is to identify, in practical detail, the problems of a local community through a three-step process. "Problems" here also includes "opportunities" and pathways to go forward. The stage is divided in three phases: Scoping, Data collection, and Visualisation.

The scoping – meaning the setting up of the framework of issues for the pilot study – took place between November 2017 and February 2018 (Fig.4). During this period, it was possible to determine with the stakeholders which were the urban issues to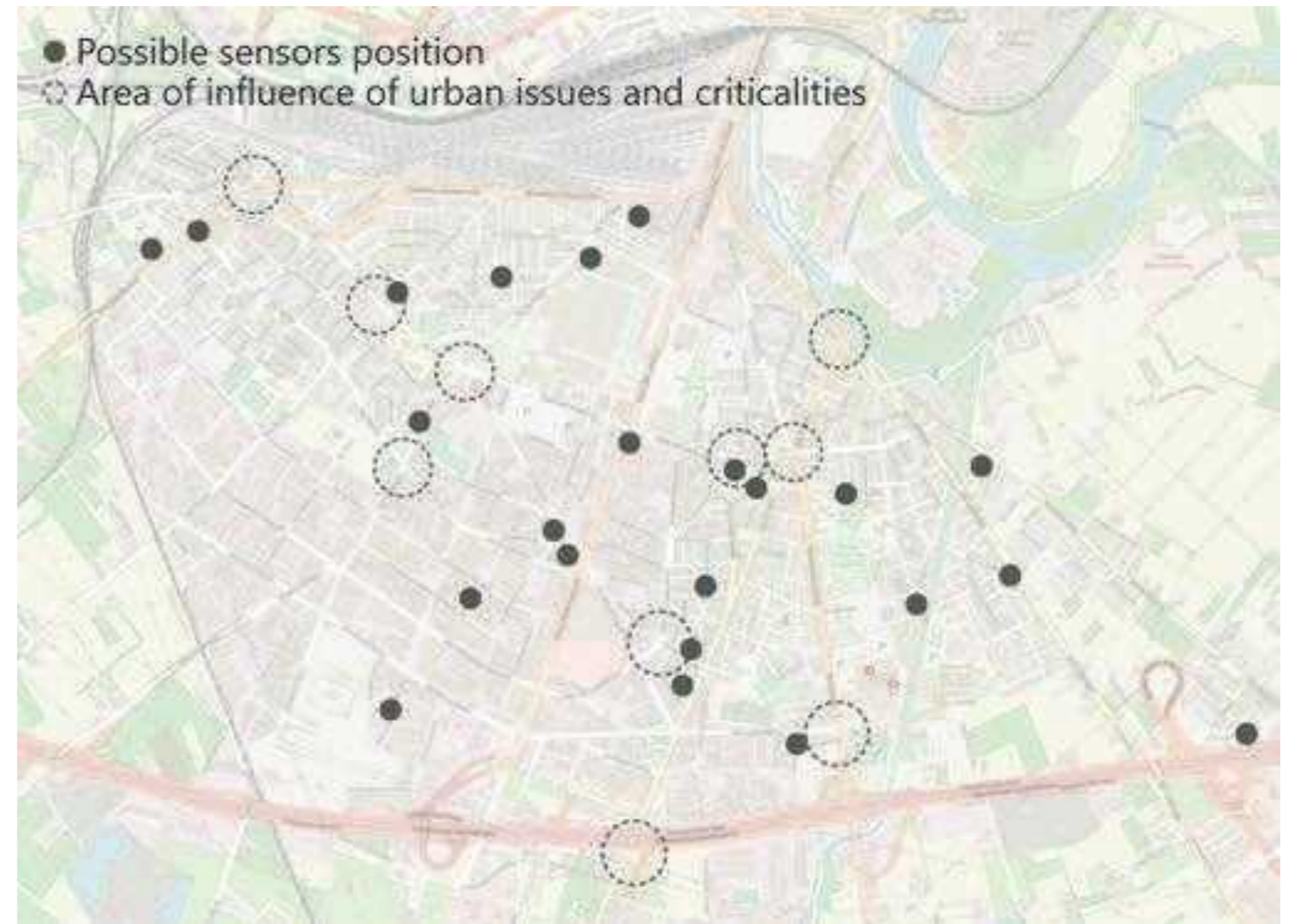 be considered. In the scoping activity, following the broad priorities for the whole Lab setup, we have focused (or zoomed) into particular interventions with problems/opportunities for the specific community, with particular attention to causes and effects. The problems later have been framed in a way that tangible aspects could have been identified through data. Typical problems found in different LOOPER Living Labs included: air quality, noise, traffic, crime, greenspace and public services. In the case of Verona, the main issues we have identified are air quality and noise pollution.

During the problem-scoping activity, the data collection activity was also planned, based on a participatory sensing campaign. The identification of data to be used as indicators of the urban problems were identified, as far possible, with the participation of citizens. Citizens have also been trained on aspects related to measuring data related to a specific issue (Fig.5) and decided the location of sensors used to measure the specific urban issues identified in the Scoping phase. Stakeholders participated in where and when to make the monitoring, using mobile stations provided by the national environmental agency – to get official and accurate measurements – and low-cost passive sensors for a crowd-sensing activity.

The decisions about where and when to make the two monitoring campaigns were taken in three meetings where both citizens and policymakers collaborated to reach a final result, which satisfied everyone. Figure 6 shows where the stakeholders proposed to position some sensors, places near their houses or close to public buildings, and where the proposed spots overlap with critical points.

After this process of scoping of urban matters, and where to position sensors, it was evaluated which places were suitable for mobile stations and which could be used to position low-cost passive sensors for noise and air pollution (Fig.7). In this activity stakeholders were helped by giving them the appropriate tools (i.e. knowledge about the issues found during the scoping, competences on sensors, and on the laws that regulate air monitoring). The first monitoring campaign took place between February and April 2018.

The Visualisations of the collected data have been produced with web-gis and similar tools, together with other media, such as audio, image, or video. These are already published on the LOOPER platform/dashboard.[5] They can be compared, where possible, with official targets, scientific thresholds, risk factors, impacts on special groups, etc. Results of the visualization phase is publicly shared information that will be discussed inside ULLs by local stakeholders, and will be analysed in terms of thresholds, targets, priorities, opportunities. For example, technical data such as air quality can be

matched to official risk categories. Social data such as greenspace can be prioritized for action. An assessment/evaluation process will decide which problems to work on, by whom, with what resources, in what timescale, and in which locations, with which priorities.

3.1.2. Second Stage: co-design and evaluation of alternative solutions.

The co-design stage started in October 2018 following some sessions of visualisation of the data collected with participants and policymakers. This activity has been about responses to the problems and opportunities. This has involved collaborative co-design and evaluation of the options. The main issue with Co-design has been the creation of an iterative loop, i.e. from concept, to sketch, to outline, to detail, etc. Each of these needs some form of participation and cooperation between experts/citizens and all the public stakeholders and policymakers.

In the co-design activity, participants have engaged in qualitative and interactive online and face-to-face deliberation activities to propose a range of solutions. This process depends on the particular use-case, e.g., air quality co-design may be quite different to greenspace co-design. In most practical cases, co-design can also be an iterative process, which can include many cycles, from concept to detail. It also involves a relationship of power between community and experts/policymakers, which can be problematic, or potentially empowering.

Activities during this stage included: ideation, designing and assessing resources. During the ideation work, participants were asked to generate creative divergent visions, ideas, synergies and possibilities. After this phase they moved to the design activity during which the iterative process started to move from a vision to a concept, then to an outline and on to conclude by reaching towards detail. During this activity the relationship established between experts (or providers) and community (or non-experts) became very important.

The process of collection of possible solutions took place both online (with a tool that could be found on the local website) and offline. Ideas produced offline have also been integrated on the online tool, which was used as a storage of possible solutions to keep participants informed (Fig.8).

In the evaluation of options phase, the positives/negatives (costs/benefits) of each solution produced in the previous phase can be compared. In most practical cases, the primary criteria will be cost/funding or feasibility. Where possible, a multi-criteria analysis will be used to appraise the alternatives, with the Multi-Actor Multi-Criteria Analysis (MAMCA) to identify stakeholders' preferences.

3.1.3. Third stage: Implementation and monitoring.

This last phase, that will take place

between December 2018 and April 2019, will include the implementation of the best options – produced inside ULLs during co-design – and the monitoring feedback of the results/effects obtained by the implementation of these solutions in the real context.

The implementation phase will be different for each intervention or use-case. Where there will be a physical action on the ground, it should be possible to involve the citizens and stakeholders through voluntary contribution. Where the action will be mainly about social innovation, or public service innovation, then the people may be at the centre of the plan, which can be risky, but also can be empowering. Activities will include: detailed/technical design & specification; contracts, service agreements, procurement paths; physical construction / service implementation / social innovation pilot. In the case of South Verona, the implementation activity
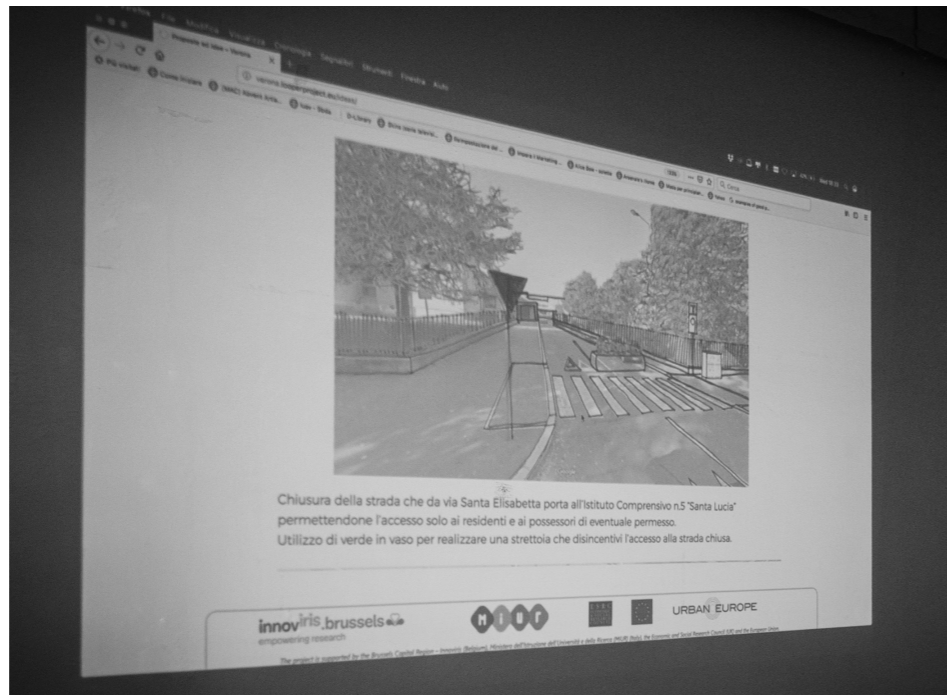

Fig.7

Fig.8

will be a forecast, as the activity has not started at the time of writing; some more physical actions on the ground such as the mitigation solutions, for example, will most probably see 30km/h areas, implementation of cycle lanes, pedestrian zones, and integration of green areas.

In the Monitoring and feedback activity, the question is then, what will be the results, impacts, outputs and outcomes? Where possible, we will monitor the impact of the implemented co-designed solutions, with the same set of tools as in the first stage and with the input of stakeholders through participatory sensing and open data. This information will then go towards feedback for the next round of problem scoping and co-design. Activities will include: monitoring of the 'before & after' results; quantitative or qualitative; evaluation of the implications - e.g., did the co-design work, could it be improved, etc; feedback into the next round, and/or urban policies.

4. Interdisciplinary and retroactive research to improve co-design inside ULLs.

As indicated in the introduction, to improve the effectiveness of co-design in urban participatory processes we have introduced the concept of community learning inside ULLs. To do this we adopted two strategies that extend architectural practice to improve participatory design. The first was to approach architectural and urban design as an interdisciplinary research, that is something that today society demands from our profession. The second was to turn to a retroactive research that reverses the experience of an architecture atelier inside the co-design activities of the ULLs. In this way we apply architecture's capacity to challenge and extend the limits of other disciplines.

4.1. Interdisciplinary research to answer society questions.

As society is always evolving and asking for new processes, methodologies, and new technologies emerge, what is needed now is to link up different professionals to obtain more comprehensive results. In the LOOPER project, this interdisciplinarity is required as the various activities are intrinsically linked to different disciplines. During the first learning stage of scoping of issues, there is a first moment in which sociological and more technical aspects work together. This is because ULL organisers need to consider the environment in which the process is starting (area, population, cultural level, educational level, etc.) in order to create a bottom-up approach that can involve the majority of the stakeholders who are interested in the work of the ULL. This runs in parallel with starting to explain the technical aspects in order to strengthen
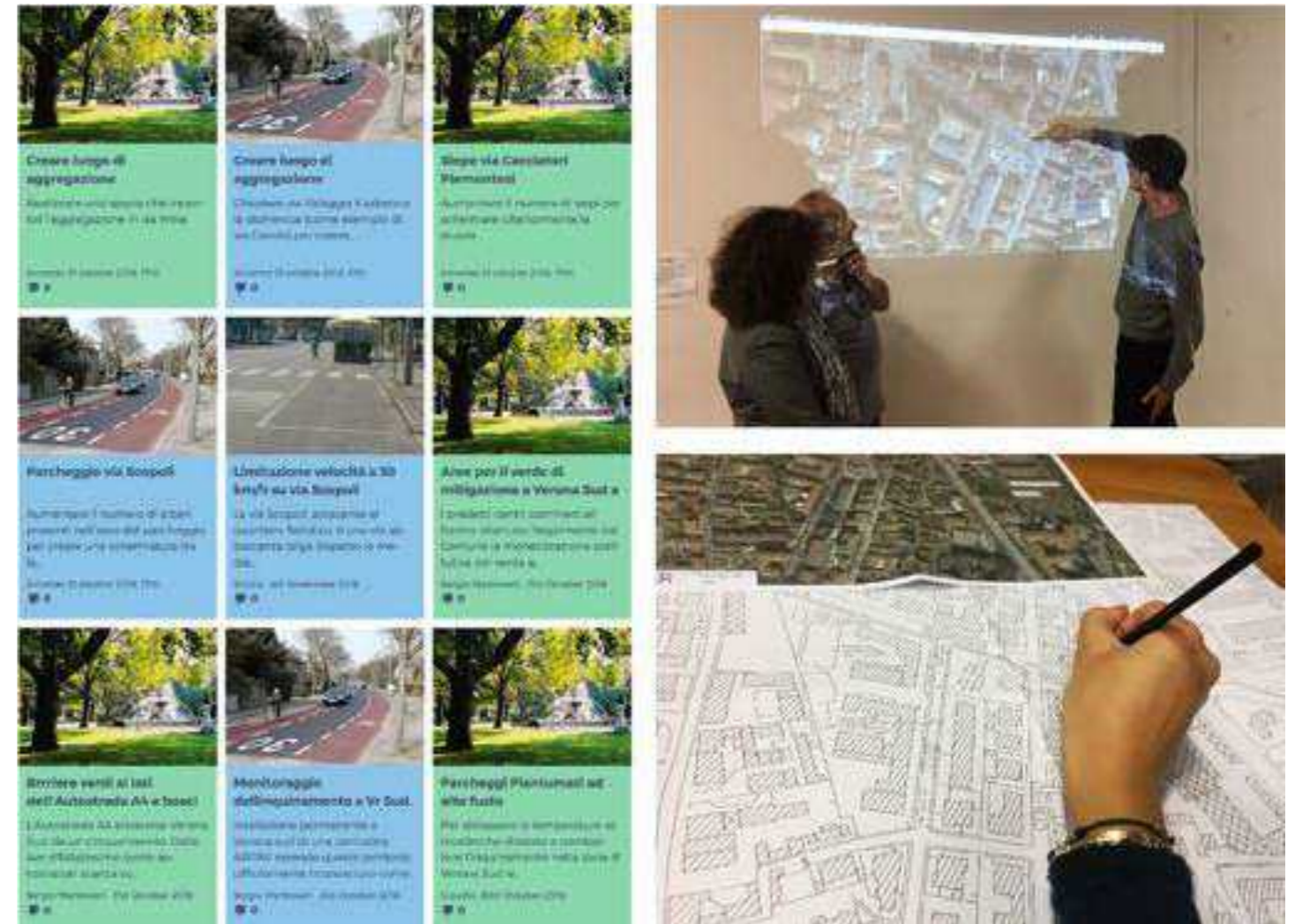

Fig.9

the bottom-up process, which, in LOOPER,

are the causes of urban issues (for example how pollutants are generated and their distribution) and the functioning of sensors that will be used to measure and understand them.

As the learning loop process continues, some more disciplines become involved to gain more complete results. Indeed, as the data collection starts, some IT competence is considered when crowdsensing is activated because there is a web app used to gain qualitative data, and an app is used to gain noise pollution data, in addition to which some self-made sensors are assembled to obtain air quality data. IT competence also allows the co-monitoring data with low-cost sensors. IT contribution can also be found during the visualisation activity as a visualisation platform has been developed in order to allow participants to check all data collected through a single tool with a user-friendly interface. The last main discipline that can be found in this interdisciplinary research is design, to be understood as architectural design and urban planning; this is most effective during the co-design stages which needs to consider multiple aspects such as changes to the viability, space usage, green barriers and spaces, etc.

4.2. The architecture atelier applied at ULLs.

People's perception of problems plays an important role in the work that the LOOPER project is engaged in. If participants don't have adequate knowledge to understand the issues they want to face, it can be difficult to reach the prefixed goals. To overcome the lack of understanding about urban problems, what can be done is to empower participants with the necessary knowledge such as to improve their approach to the topics they will be working on. To do so, people need to be able to recognize how problems can be measured, how to identify them through co-monitoring campaigns using adequate tools and, moreover, to interpret data they collected in order to understand if their initial perception was correct. In practice, as in University Ateliers, citizens need to gain knowledge, then apply what they have learned, and then repeat and/or

revise their production after realizing the limitations of their work up to this point. This process works on the principle of learning-by-doing, which means that there is both a theoretical aspect and a practical part. What happens is that theoretical knowledge can be sedimented by applying it to practical cases in order to have a way of checking what works ... or doesn't work. In fact, in our approach, the remedial solutions that stakeholders decide are applied to the urban fabric and then are assessed by monitoring their accuracy and efficacy.

Fig.9 shows two moments of ULLs activity where ideas and solutions were discussed and noted. On the left of the image, we can see a screenshot of the LOOPER portal where all ideas produced during the ULL sessions are stored. This virtual place that collects all the inputs of the ULLs, represent a repository of knowledge that can be consulted and used by all the stakeholders. The experience of some persons of any one particular living lab is therefore accessible to all the other participants exactly as happens in an architectural atelier where students learn not only by the advice and indications of teachers, but also by confrontation and comparison with other students.

5. Conclusions.

At the time of writing this article, the co-design activity (Fig.9) is almost concluded (it will end between December 2018 and January 2019), but there are some concrete results that can already be found within the process and that has generated relevant impacts. The first result is related to social interaction; participants changed their way of approaching urban issues, which was a slow process taking place every time a new interdisciplinary link was added to the work done within the ULL. As a consequence, participants started to change the way they now interface with policymakers looking for cooperation and a constructive exchange of concepts, ideas and vision, rather than engaging in an ideological confrontation of attitudes or approaches. We recognized the same improvements also from the policymaker side. This is a result of the bottom-up process activated when considering

sociological aspects linked to the area of South Verona.

Another result is linked to the conclusion of the first learning stage and is related to the behaviour of citizens regarding the urban issues. During the meetings, it was possible to notice how, faced with the duty of choosing where to position sensors, citizens had to think back on their views and had to deepen their knowledge on pollution-related issues and on what produces it. This is a preliminary step of raising consciousness, as citizens understood that to deal with urban issues in an effective way, they had to improve their knowledge of the problem and its particular cause. After the co-monitoring stage the process is now proceeding, from October 2018, with the co-design and will move forward in the first few months of 2019 to the evaluation stages. During the co-design stage, citizens are learning how urban spaces can be changed to improve the neighbourhood, and what is possible (or not) to do in an urbanized area. This is a further step in raising awareness and of increasing knowledge.

These three main results are a first step in overcoming one of the problems of participatory design that we declared at the beginning of this paper: the production of superficial ideas, or complex and unrealistic projects. In addition, after the implementation of the selected mitigation measures, citizens will be asked to evaluate their work by undertaking another campaign of monitoring to see if the solutions identified and chosen during the co-design improved the situation (evaluation stage). This will be a further occasion of acquiring and "storing" knowledge, enriching the process by which knowledge grows inside the ULL, a point that we identified as a strategy to improve the effectiveness of ULLs.

What is expected now, is the establishment of a process of collaboration with the public administration (bringing contributions and improving urban management). The growth of experience in the citizen body working in these participatory design processes is aimed at removing the clash that is commonly found today and which generates inertia and failure to solve urban issues.

Notes

1. See Air quality in Europe – 2017 report.

2. See Bladwin Johnson, 2011; Oltra and Roser, 2014; Saksena, 2011.

3. As Robert Beck suggest learning objects are much smaller units of learning, typically ranging from 2 minutes to 15 minutes. Are self-contained as each learning object can be taken independently. Are reusable as a single learning object may be used in multiple contexts for multiple purposes. Can be aggregated as learning objects can be grouped into larger collections of content, including traditional course structures. Are tagged with metadata as every learning object has descriptive information allowing it to be easily found by a search.

4. See Legrenzi, 2016.

5. For the general LOOPER website use www.looperproject.eu; for the Verona Living Lab platform use veronalooperproject.eu

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