

Live Lab, a case study in Eindhoven, tools for participation

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Abstract. This article gives an impression of the start of one of the winning projects of an EU Tender iCity in Eindhoven, the Netherlands named Live Lab. Live Lab is a virtual and physical platform for sharing knowledge, ideas and experiences and open to residents, government and organizations. LIVE LAB helps to achieve a better living environment by coming up with innovative solutions to implement. It is a mobile and flexible lab with screens / digiboards, voting boxes for the participants, a stand-alone interactive vandal-proof outdoor screen that can be placed in the public space. It is supported by an online environment where background information, chat, exchange of media is possible to prepare the meetings. The project builds on experiments in the past with "Decisions rooms" and the current "Future Centers" only this time with a low budget and in a "easy to use way." Atelier Tom Veeger Art Light Architecture will develop this in close cooperation with Mad emergent art center , it will be part of their project Mindhoven.

Keywords. Living lab; participatory design; co-creation; architecture; StrijpS; Eindhoven; live lab

Live Lab, the toolbox for 21st century cities

This article gives an impression of the start of one of the winning projects of an EU Tender iCity in Eindhoven, the Netherlands named Live Lab. This project is aiming at the integration of multiple information technologies with state-of-the-art social - and design knowledge into a product that holds practical tools and protocols.

Imagine yourself organizing a public consultation on the design of the public area of StrijpS. You want real discussion, present information, you want the public to have an opinion, having already discussed the topics with other inhabitants, you want the people to actually participate in the proceedings. You want them to choose from several solutions and designs. In the period before the consultation; a Marker (interactive billboard) is placed near the Torenallee. It's a beautiful and semi-transparent screen where information is showed 24/7 and where you are able to interact with, it responds. Not only will the information be available virtually and online, but it will also be shown in the public space itself.

Live Lab is the integration of multiple information technologies with state-of-the-art social - and design knowledge into a product that holds practical tools and protocols.

Live Lab is a virtual and physical platform for sharing knowledge, ideas and experiences. It is open to residents, government and organizations.

Live Lab helps to achieve a better living environment by coming up with innovative solutions for implementation. It is a mobile and flexible lab with screens / digiboards, voting boxes for the participants, a stand-alone interactive vandal-proof outdoor screen that can be placed in the public space. It is supported by an online environment where background information, chat and exchange of media is possible to prepare the meetings. The project builds on experiments in the past such as "Decision rooms",

“Design Spaces” and the current "Future Centers". However, Live Lab can be implemented on a low budget and prides itself in being very user friendly.

Atelier Tom Veeger, Art Light Architecture, will develop this in close cooperation with MAD emergent art center. It will be part of their project Mindhoven.

For the Live Lab iCity product we will concentrate on a combination of three specific tools:

- The external interactive Marker
- a virtual interactive environment
- tools for the Design/Decision room

Process

In Live Lab we focus on developing "smart" tools to improve participation in the design and decision-making process of the living environment. To get a clear picture of the relationship of smart technology with design and decision-making processes, it is good to conduct research into the method and design of similar projects and "proven techniques". Participatory design in an urban environment is strongly in the interest of citizens. A 'do-it-yourself-government' is an important part of new policies and a hot topic in the media.

“If you want to create successful meeting places, you have to rely on the strength of the area where they are located. Consulting users is crucial. They are the local residents, businesses, visitors and owners who know what the opportunities of the area are. In the process of co-creation you can create unique meeting places which form the basis for a successful city. Determining what should be done in an area in a timely manner leads to uniformity”

<http://www.cultureleazondagen.nl/zondag/2014/de-stad-de-toekomst>

Participatory design

Experimenting with Participatory design in Public Space is a new concept and so far it remains limited to a few successful examples. It is interesting to see that in other areas this process has made already further progress. The theory behind Co-creation, Service Design and Design thinking has been strongly developed in recent years and we can learn from the way it is applied.

"Participatory design is a way of designing with end users as full participants to be involved in the design process often from the very beginning and see the participant as equivalent, as a partner. In the industrial context, new products and services are increasingly designed with users. Companies such as Microsoft, Apple and Philips put the end user and his experience central to their innovation processes” Ingrid Mulder Delft University of Technology Department of Industrial Design

Design and decision-making in the public domain are complex processes which are highly dependent on the goals, the underlying political agenda and social developments in society. In Participatory design, the design process can therefore not be seen separately from the decision process. Advances in technology may be able to play a fascinating role here. The rapid development of open data, social media, Serious Gaming and virtual / augmented reality are intriguing and challenging processes affecting the (political) decision-making.

“It is expected that cities will develop into smart cities full of intelligent sensor networks and interactive social media. The city by then will be given tools to feel what is happening with the city and their citizens. Simultaneously, through mobile internet and smartphones the "online" world melts with the physical environment of the city. All that makes it possible for citizens to increase participation in the public domain in an accessible and intuitive way. Would it be possible to support citizens in smart cities at the local level with self-organization and facilitate decision-making?

Without a good design a scenario of a participatory domain is not guaranteed: the ideas of governments and companies for smart cities are mostly closed systems in which citizens just lose control and their privacy; some architects and designers have a tendency or desire to design all experiences in advance and therefore it will limit the creativity of citizens. Will the smart city become an automatically orchestrated experience and an area like a monitoring station where the government can monitor citizens? Or will it become a participative city where citizens join co-creation of their environment? How can that be used for a new form of self-organization (chaos, spontaneous) and co-creation between government and citizens?"

Maurits Kreijveld <https://wisdomofthecrowd.nl/>

This is an interesting debate in which **Live Lab** wants to play a role, focusing on a number of aspects in the process and providing **smart tools** to improve it. We are focusing on communication, brainstorming and decision making.

Communication

Good communication and information are of extreme importance at all levels. Research shows that the Internet is an important tool that can play a unique role through the speed at which information can be spread and the accessibility for large groups of stakeholders. It is an interactive medium in which the exchange of ideas, the possibility to upload material, start discussions and share knowledge effortlessly are unique (see examples in social media such as LinkedIn and Facebook). We also look at the possibilities of interaction, with the features of the internet as a tool to achieve this goal.

"The Internet has created new ways for us to connect to each other and exchange ideas and information. This allows us to make much better use of all the talents, ideas, knowledge, creativity and manpower that are present in our society. Collectively we can be smarter. This is often referred to as the 'wisdom of crowds': under certain circumstances, a large group of individuals can take wise decisions and make good predictions". <https://wisdomofthecrowd.nl/english/the-wisdom-of-crowds-visions-of-the-future/>

Information

Transparency of information is an essential part of Participatory Design which ensures a strong commitment to the participants. There have been experiments with this in co-creation projects in public space .

"Communication plays a clear role in a participation process. When entering a participation process people should experience a feeling of welcomeness. It is important that they are well informed and are provided with constant feedback. From the start people should know how a procedure works, what is expected from them, how much time it will cost them and what will happen with their contribution. During a process people should be invited to think freely, yet should know that there are some constant factors that they need to take into account. After a participation process it is evident that the result is communicated to all people involved." (Nathalie Stembert '2011)

If we look at the design process the description of the Double Diamond design process is enlightening and gives a 4tal stages. In each stage Participatory Design can take place.

"The '[Double Diamond](#)' process maps the divergent and convergent stages of a design process. Created by [The British Design Council](#), it describes modes of thinking that designers use. The Council's origin is Industrial Design – which is about creating

tangible objects. As such, the model seems like a linear process. It describes significant up-front design, before going on to produce a final solution.”
<https://www.thoughtworks.com/insights/blog/double-diamond>

Understand; the process begins with a trigger. This could be an idea, a problem, a change in needs of a public domain. This phase is divergent and exploratory – it’s a search for new questions. Opportunities are identified for further consideration.

Define; from a place of some understanding, we begin to synthesize knowledge into insight. It’s about converging on a vision and defining the first expression of our plans to occupy a future position. A strategy should adapt when we make new discoveries. It doesn’t need to define all details of a solution. Instead, the focus should be on the desired outcomes or impact to achieve.

Explore; With a vision in place, it’s time to explore the best potential solutions. This is a divergent and iterative activity. Details and requirements have not been defined – instead, the right solution is discovered.

Create; Now we’re creating and optimizing working designs.

This 4 steps can be done in several different ways but online or software tools can be helpful to expand the amount of participants and to speed up the design process and the decision process. Also the process itself and the outcome can easily be shared virtually. This is very helpful if you aim to a transparent process of Participatory design.

Just as there are lots of ways to use real sticky notes, there are lots of ways to use online sticky note tools. Tools for Online Brainstorming and Decision Making in Meetings can be helpful to improve the outcome. But, how do you do the sticky-note thing online? You can find dozens of online sticky note and brainstorming applications, but not all of them work well as part of an online meeting. We decided to test out all the online sticky-note, brainstorming, and decision-making tools we could find to figure out just which ones work best for quick collaborative sessions during a meeting. [Lucid Meetings Blog](#)

Research

In the next few months we are going to experiment with the different software to understand the way how it improve the process and how easy it be implanted in a design process. This will take time and effort and experimentation.

To give an insight of the way we would like to handle the process with new tools we describe a test case at StrijpS: Pixelplein we want to start with. It will have a Lab functionality, it is a testing ground for new software tools and ways of communication.

It also shows the 3 tools we would like to focus on:

- a virtual interactive environment
- tools for a Design/Decision room
- an external interactive Marker

Pixelplein – the test case

A green public space between the SWA building and Bosch Glass Building, in front of the Apparatenfabriek is the location where a co-creation design process is started in this virtual test case. We named the square “Pixelplein” referring to the Philips history making screens for television and computers, where pixels are the basic elements for electronic display.

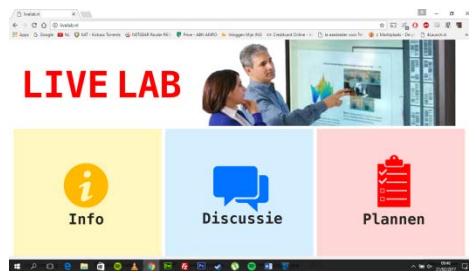
The goal is to find an interpretation for this place where the "workers" in the buildings situated along as Bosch, Hotbed and the "residents" of Strijp-S both can agree. Place making as a challenge for residents and workers together.

The Live Lab phases are a sequence of design performances using state-of-the-art knowledge, technology and experience. Applied to Place making of the new Pixelplein.

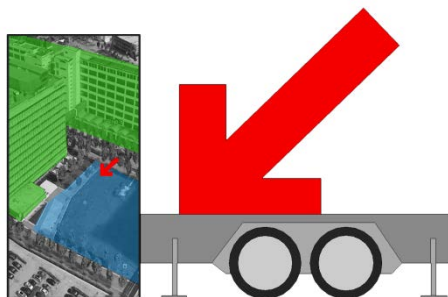
Phases in the process

1. Placing a Marker and launching a website

Placing a clear "sign" at the site with the aim of making the "public" curious, it is a focal point of attention, it heralds the "open" process of design. The display is interactive and invites to respond, provides information and is linked to a website, an interactive environment where "discussions" can take place and "posts" could be placed



The website is informative, an interactive gathering place for comments, upload bookmarks good examples and ideas.



The "Marker" itself can be controlled via touchscreen, Kinect or via smartphone with an app (to decide after research). The option is to fill in the Marker location as a small festival area with tables, benches, lighting e.e.a. dependent on this is necessary and how far we are in the process.

2. active approach of participants

To approach the "workers" in the buildings of Bosch, Broeinst and Glasebouw, DDF and Yksi and Ontdekkfabriek in an analog and digital way. To approach the "locals" in the adjacent area with the new residential blocks and the apartments in Anton / Gerard.

3. Participatory Design



From these groups we propose to discuss 4-tal design teams the challenge together, generating ideas and shaping them further in some designs. The process takes place in a number of separate sessions or in the form of a Hackathon. The workshop, brainstorming sessions are supported with software and hardware tailored to visual means. We use the tools of the Design / Decision cream, interactive screens that played well is put firmly the process Many workshops are intriguing pursuits but the process and the potential outcomes part disappear, they are not recorded in a proper manner. At the workshops, and / or hackathon can temporarily pavilion (or in this situation a greenhouse) is hired as an extension of the marker. = Transparent glass, place for design and discussion, visible to everyone and inviting, can also be used as an information center, with a casual walk. Aware is chosen for hiring these types of resources to respond flexibly.

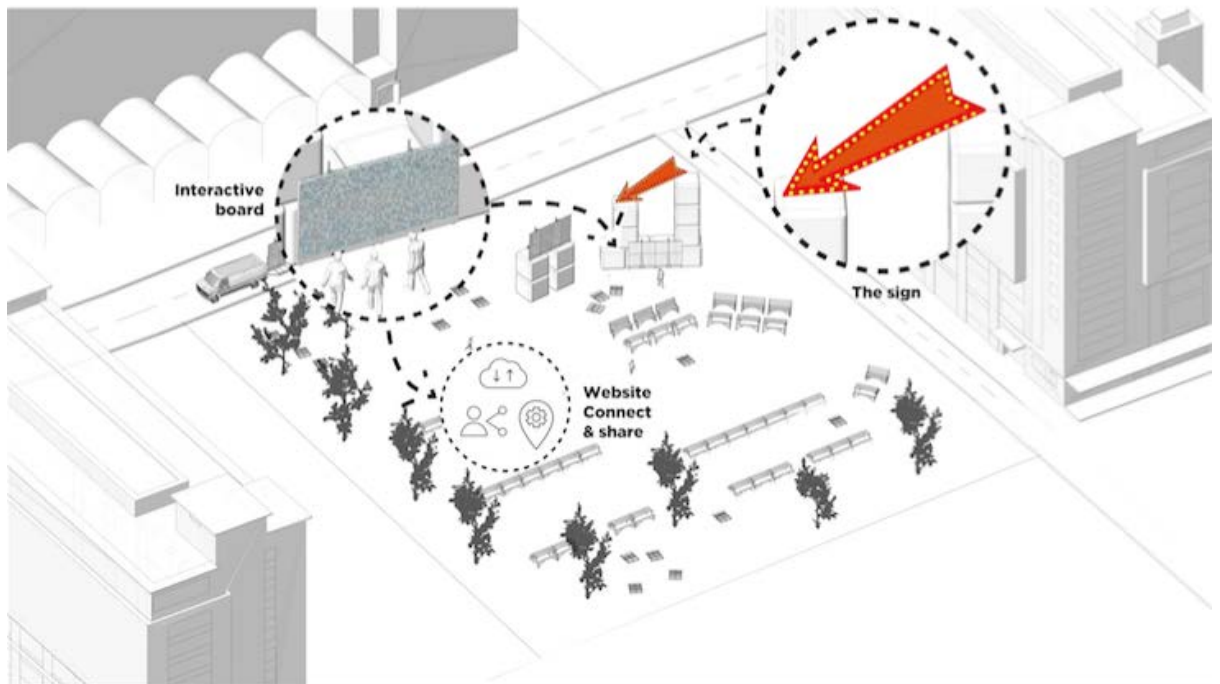
4. Show, VR

Translation of the sketch designs into a VR environment, the option is to use it also in a 3D game, made visible to the general public on site using simple 3D VR glasses but also be seen on the website and on the marker. To Show the process of the establishment of the various designs what has been recorded during the workshops. This can be stimulating and informative.

5. The Solution

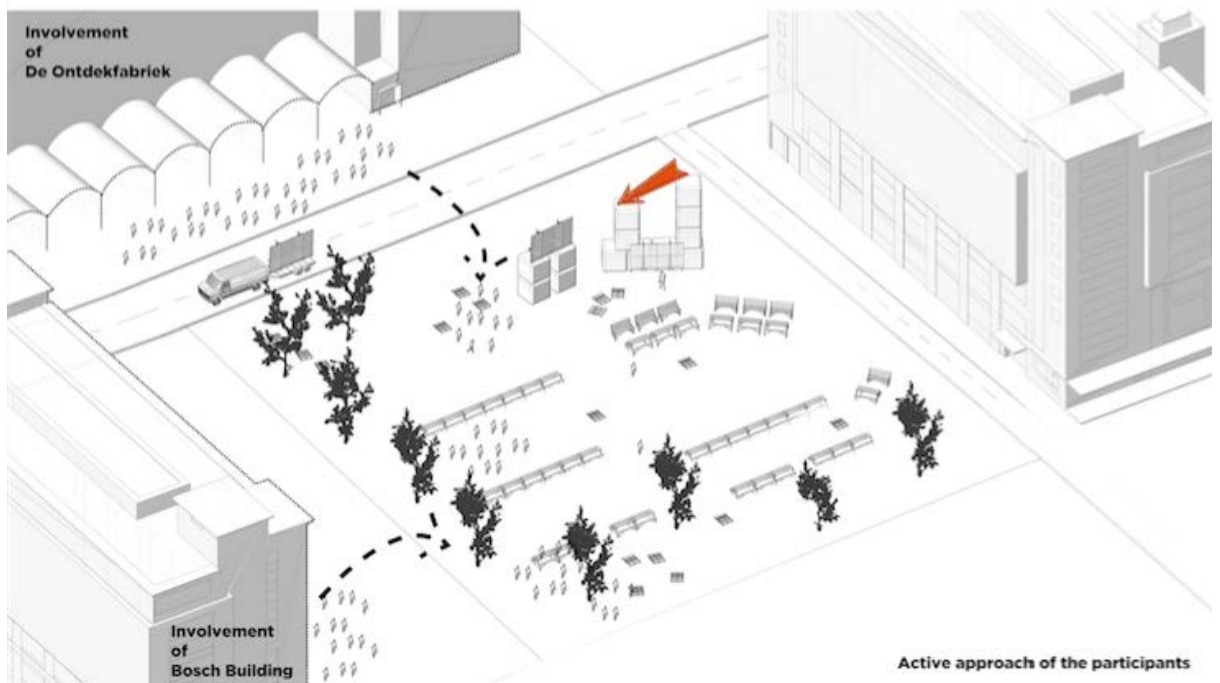
The design space will be turned into a decision room. Different designs are displayed virtually on the website and on location in the greenhouse, the vote will take place virtual and real, the pros and cons are discussed Subsequently it is tested, and a prototype of the design is performed.

PHASE 1 THE MARKER



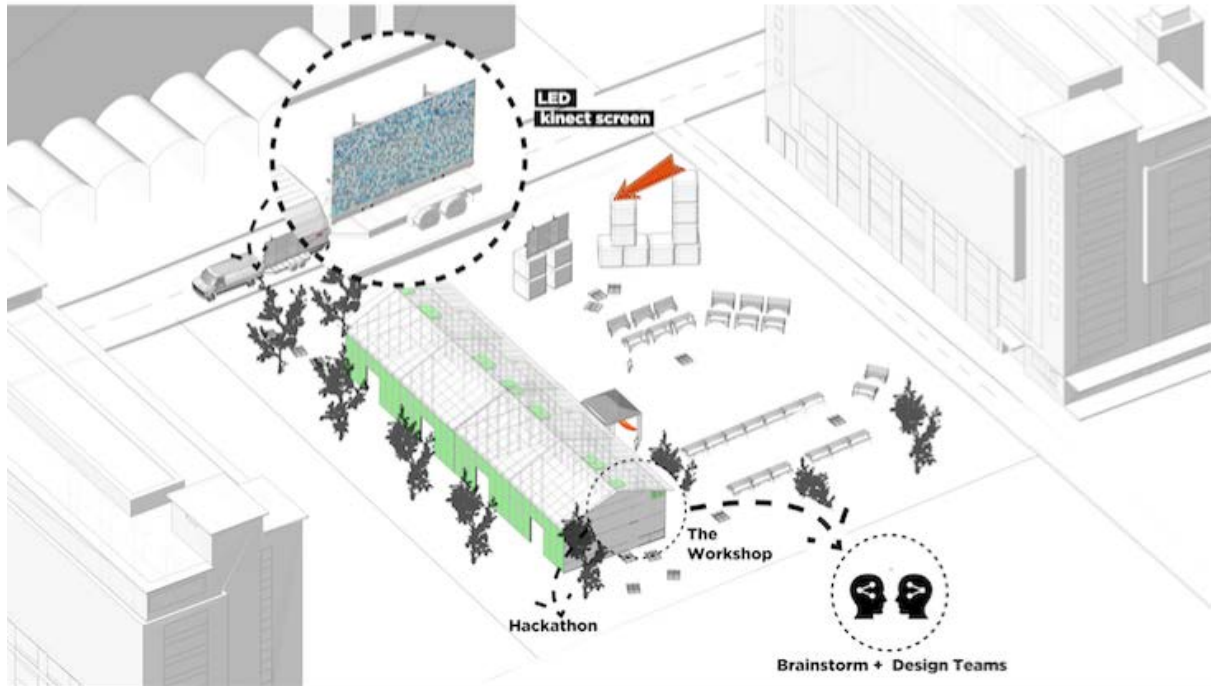
The Marker is a central part of the product: it attracts and invites people to participate.

PHASE 2 INVOLVEMENT



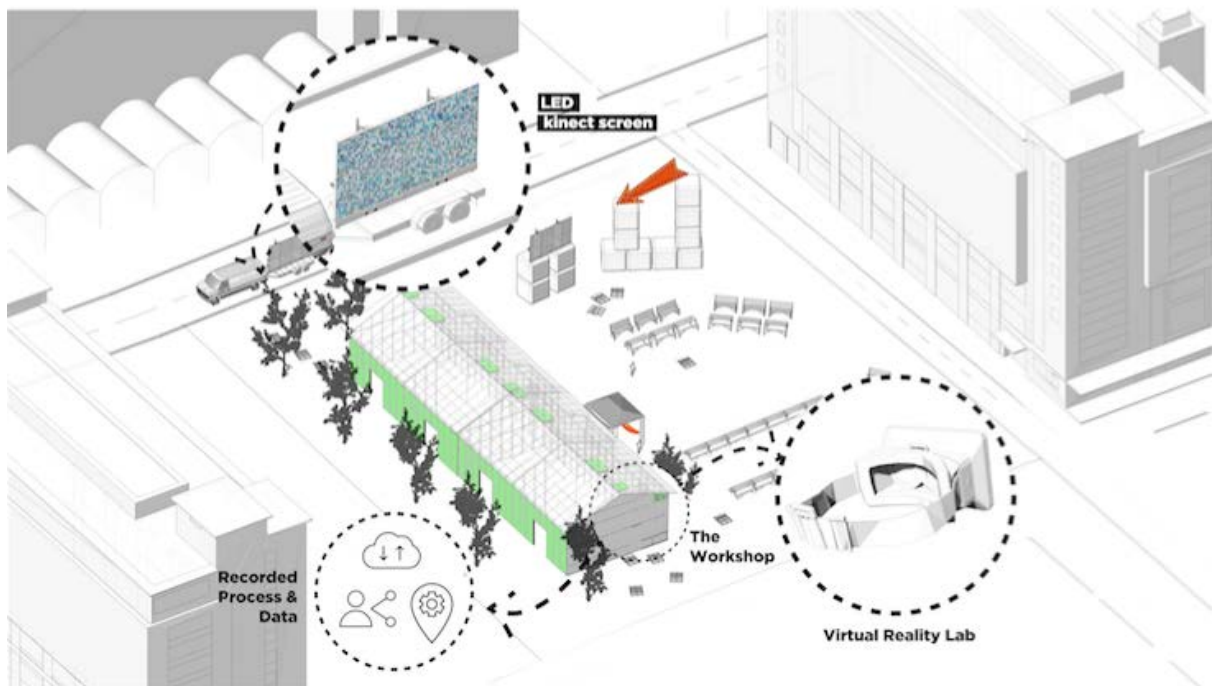
The combination of residents and workers invokes a high level of involvement.

PHASE 3 PARTICIPATORY DESIGN



The design phase uses various creative technologies, and is performed in a dedicated Design Space.

PHASE 4 VR TOOLS



The virtualization of the concepts enables people to experience the found solutions.