xR4DRAMA

Extended Reality For DisasteR management And Media planning

H2020-952133

D4.4

VR AUTHORING TOOL v1

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Abstract

This deliverable describes initial version of VR Authoring tool.

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History

Version	Date	Reason	Revised by
V0.1	21.09.2021	Table of contents	Yash Shekhawat
V0.2	15.10.2021	First Version	Yash Shekhawat
V0.3	22.10.2021	Second version	Sebastian Freitag
V0.9	27.10.2021	Deliverable for review by U2M	Yash Shekhawat
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Executive Summary

The deliverable provides the first prototype of the Authoring tool. Section 1 introduces the deliverable with the structure and the contents.

The next section provides the overview of the requirements from the use cases. The requirements gave us a starting point to implement the features of the first prototype of the Authoring Tool.

The third section of the deliverable gives the information on the first prototype, from the internal architecture, current functionalities to installation requirements along with the demo information and screenshots.

The final section gives information about the next steps that will be implemented in the future prototypes.

Abbreviations and Acronyms

POI	Point of Interest
PUC	Pilot Use case
VR	Virtual Reality

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1 INTRODUCTION

This deliverable is a supporting document to the software components delivered as part of 1st prototype of the entire xR4DRAMA, developed as part of WP4. The deliverable covers the requirements from the users concerning the Authoring tool and the prototype development, from architecture of the tool to the functionalities and the installation requirements.

The main aim of the xR4DRAMA Authoring tool is provide the entrance to the platform from a PC and will be mainly used by producers as well as the management of the first responders.

The tool will allow access to the entire system where the users will be able to create projects that will include one incident or production. The tools main motive is to provide the situation awareness while the people are far away from the actual geographical location.

The deliverable provides the overview about the tool and the future work.

2 REQUIREMENTS FOR THE TOOL

According to the use cases, the users provided multiple requirements which were reported in "D6.2 – Final user Requirements", a document that was submitted in Month 8 of the project. The main requirements concerning the Authoring tool is noted here.

2.1 Disaster Management Use case requirements

Table 1 Disaster Management requirements

Info-ID	Category	Name	Description
PUC1-01	Geography, Surroundings	Rivers, Embankments	indication of rivers, water courses, riverbanks
PUC1-02	Geography, Surroundings	Manholes, electrical and gas pipes	indication of manholes, electrical and gas pipes
PUC1-03	General information	Areas of attention, safe waiting places, shelters	Information on the presence of areas of attention, safe waiting/parking places, shelters, sand-bag distribution areas
PUC1-10	Environmental factors	Sensor measures	Information on environmental variables: water level, rain, temperature, humidity
PUC1-15	Geography, Surroundings	Land use change, past flood events' extent	Information derived by satellite images analysis
PUC1-16	Flood risk management	Population potentially in danger	Information on the potential presence of people in areas at risk
PUC1-17	Flood risk management	Cultural heritage/natural sites potentially in danger	Information on the potential presence of cultural heritage/natural sites

2.2 Media Production Use case requirements

Table 2 Media Production requirements

Info-ID	Category	Name	Description
PUC2-01	Environmental factors	Noise pollution	identification of possible sources like busy roads or highways, crowds of people, factories, airports, railway stations, railway tracks

PUC2-02	Environmental factors	Light Pollution	identification of possible sources like streetlights, ads etc.
PUC2-03	Accessibility	Parking	availability of parking
PUC2-06	General information	General information on site/buildings	textual information on specific sites/buildings in the area of interest
PUC2-07	Environmental factors	solar altitude during the day	simulation of the course of the sun during a day
PUC2-08	Facilities	Power	availability and accessibility of power outlets
PUC2-09	Facilities	Bathrooms	availability and accessibility of bathrooms
PUC2-10	Facilities	Restaurants, Cafés etc.	list of/indication of available places to eat/drink
PUC2-14	Environmental factors	Noise situation on site	the noise situation on site recorded by the location scout via a Smartex device as mp3-file

3 OPERATIONAL PROTOTYPE

3.1 Internal Architecture
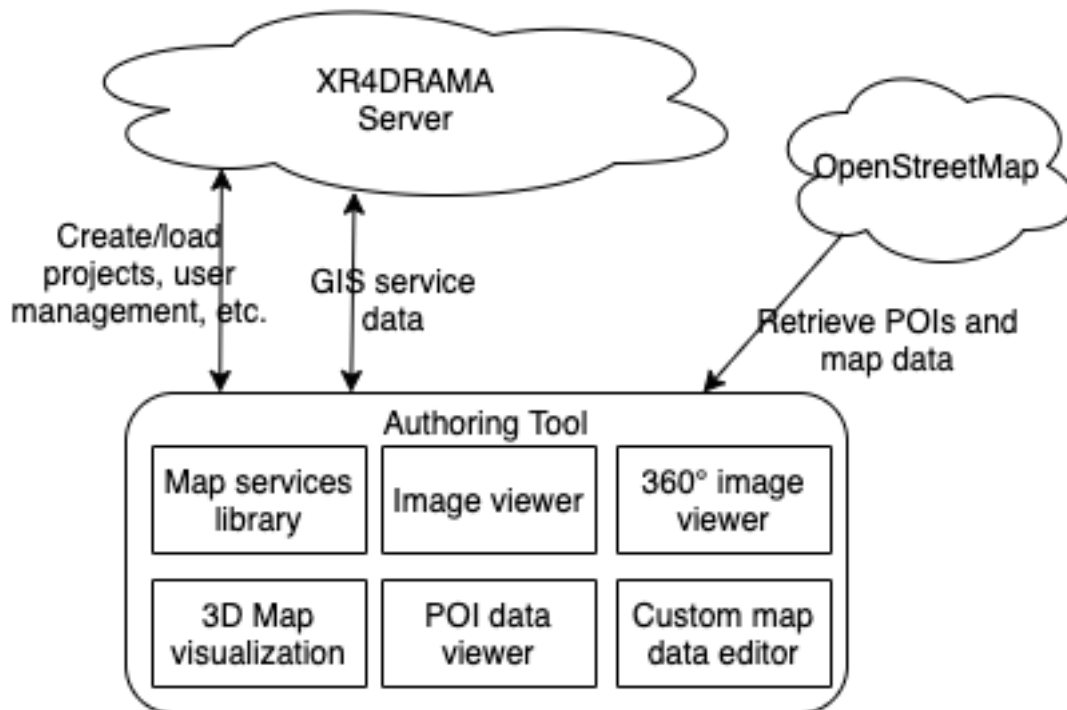
Figure 1 Internal Architecture of xR4DRAMA Authoring Tool

The Authoring tool is connected to 2 major servers to retrieve and save data, the xR4DRAMA backend using the REST API component and the OpenStreetMap servers to retrieve Map and location information. The tool consists of 6 major components:

1. Map Services Library: This library helps in downloading and loading of the Map from OpenStreetMap.
2. Image Viewer: This component works on viewing the user generated images.
3. 360° Image Viewer: This component helps display the 360° images uploaded by the users.
4. 3D Map Visualization: This component views the Map in 3D and with different layers.
5. POI Data Viewer: The component views the various POIs on the Map specific to the location.
6. Custom Map Data Editor: This component helps users add and modify the data on the map. This data is saved to the xR4DRAMA backend allowing visualizations on other frontend tools of the platform.

3.2 Current Functionalities

Currently, for the first prototype the following functionalities are developed:

1. User Creation: When starting the application, the user can create a user account on the platform for themselves. Currently, a username and password is required; in the upcoming versions, user verification will also be done for security reasons.

2. Project Creation: Once the user is logged into the platform, the tool allows the user to create a project, to do so a project name and location is needed. Project information and dates of the projects are optional functionalities that the user can add.
3. Adding users to projects: User has the functionality to add other users to the project to be able to collaborate on the project.
4. Choosing a location on a map: Once a project is created, user can choose the exact location of the project, based on the previous location provided. The tool uses OpenStreetMap[1] to get the map data as well location of interests in the desired area.
5. Add/View and Edit various media/text data on specific locations on the map: Users have the ability to add text/images/videos at a specific location in the map. This will allow other users to view and edit them. This will allow users of other tools to also see the media.
6. Connect to the VR Collaborative Tool: The tool has the ability to start the Collaborative VR tool.

3.3 Installation Requirements

The tool requires the following to run with VR Capabilities:

- OS: Windows
- CPU: Intel i5/i7/i9
- RAM: Minimum 16 GB
- HDD: Minimum 5 GB Free
- Graphics Card: Dedicated card

To run the tool with and be able to launch the Collaborative VR Tool, the following is required:

- OS: Windows
- CPU: Intel i7/i9
- RAM: Minimum 32 GB
- HDD: Minimum 5 GB Free
- Graphics Card: NVIDIA GTX 2080 or above
- VR Headset: HTC Vive

A "VR Ready" Laptop will also be able to run the tool.

3.4 Screenshots and Demo details

The demo can be downloaded at the following link:
https://drive.google.com/drive/folders/1WQsctB4RLUwoTPYTNnUb6gmj8KtcKozB?usp=sharing

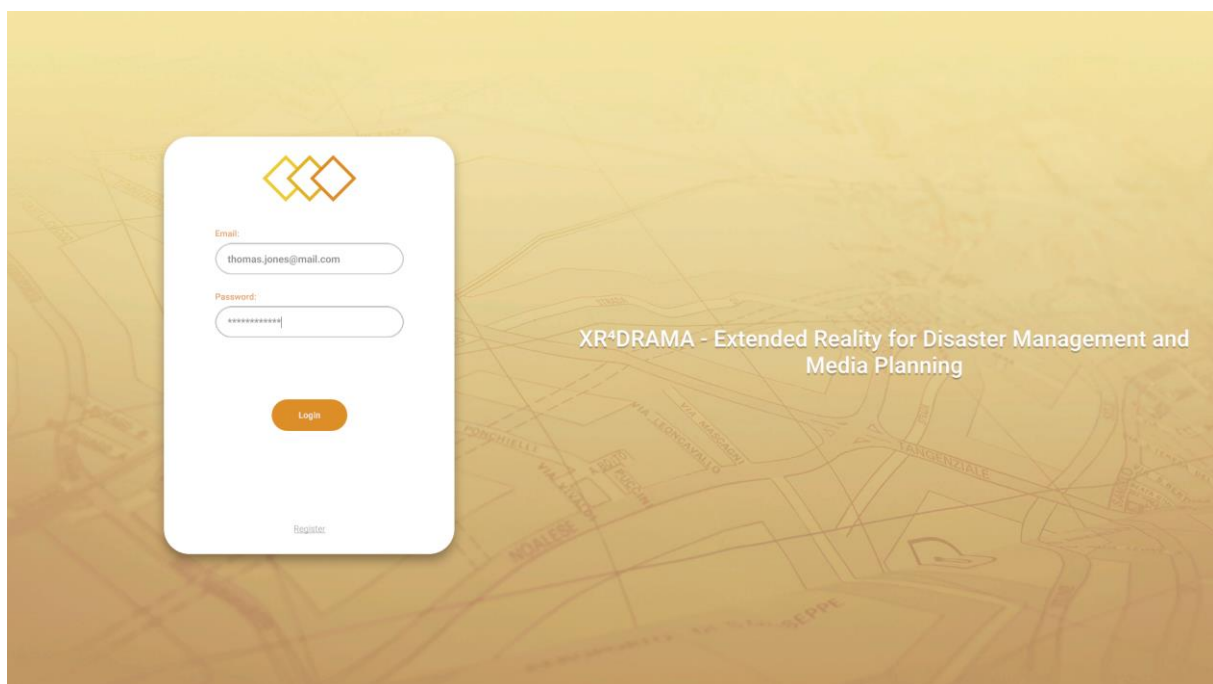To use the tool, download and open the file xR4DRAMA Authoring Tool.exe

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[1] **https://www.openstreetmap.org/**
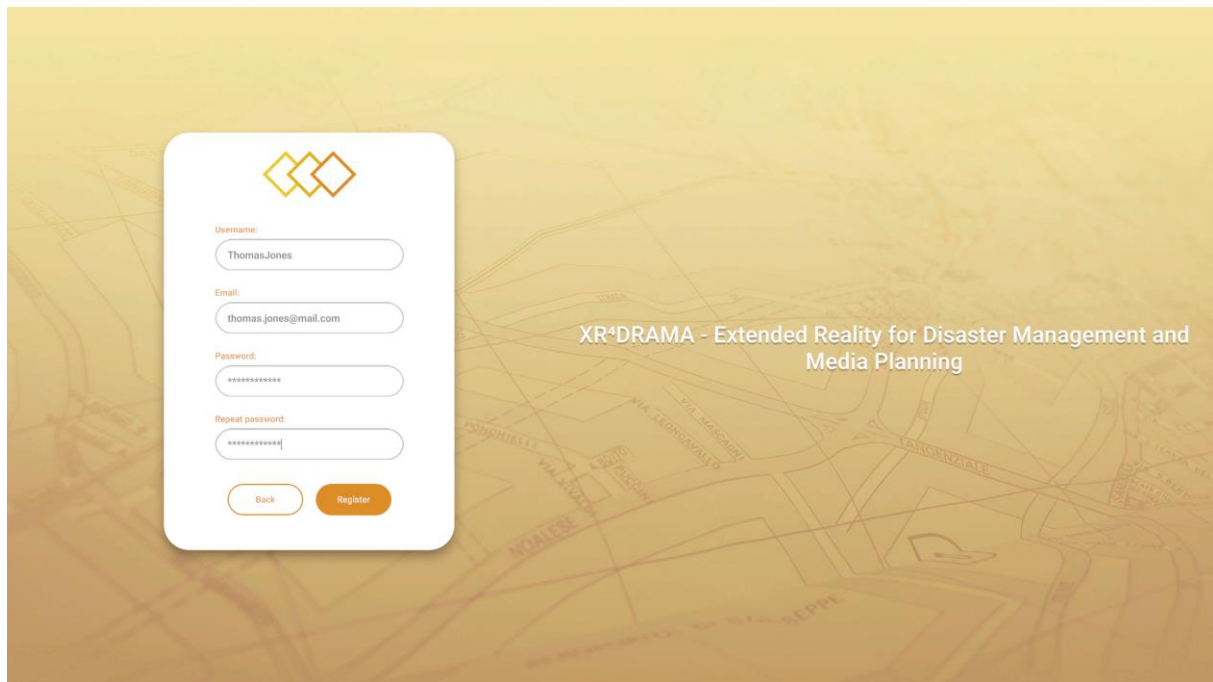
Figure 2 Create User screen

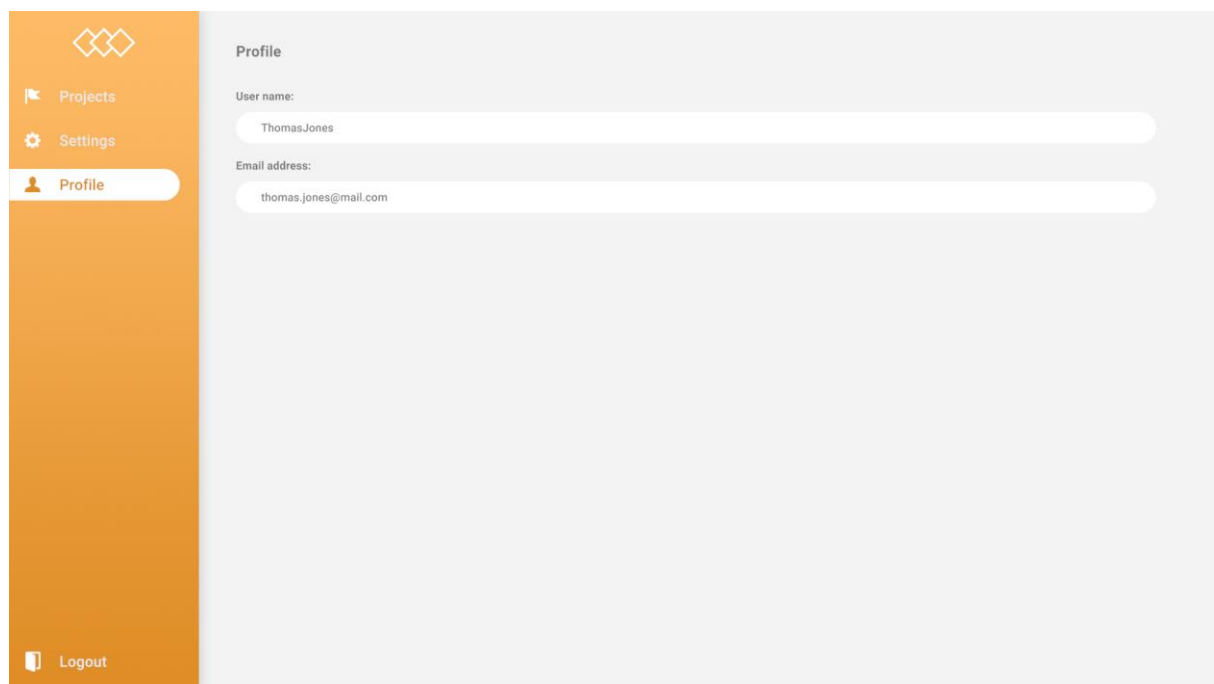Figure 3 Login screen
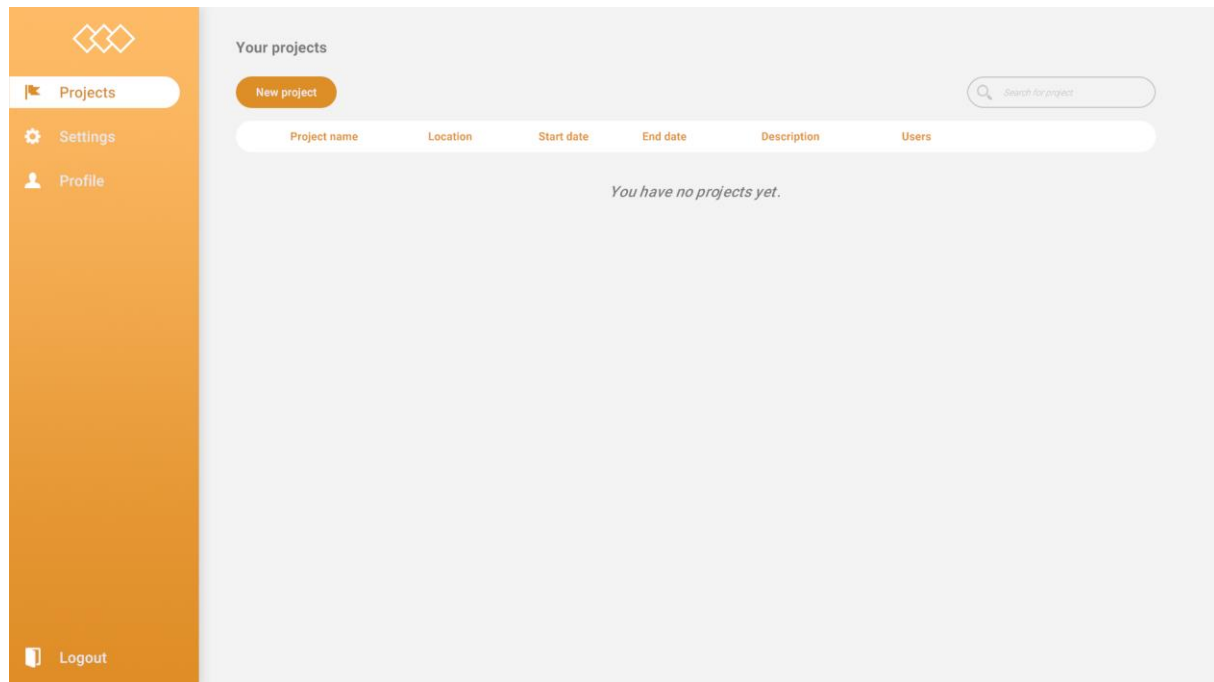
Figure 4 Home screen with projects

Figure 5 Profile Information

Figure 6 Create new project
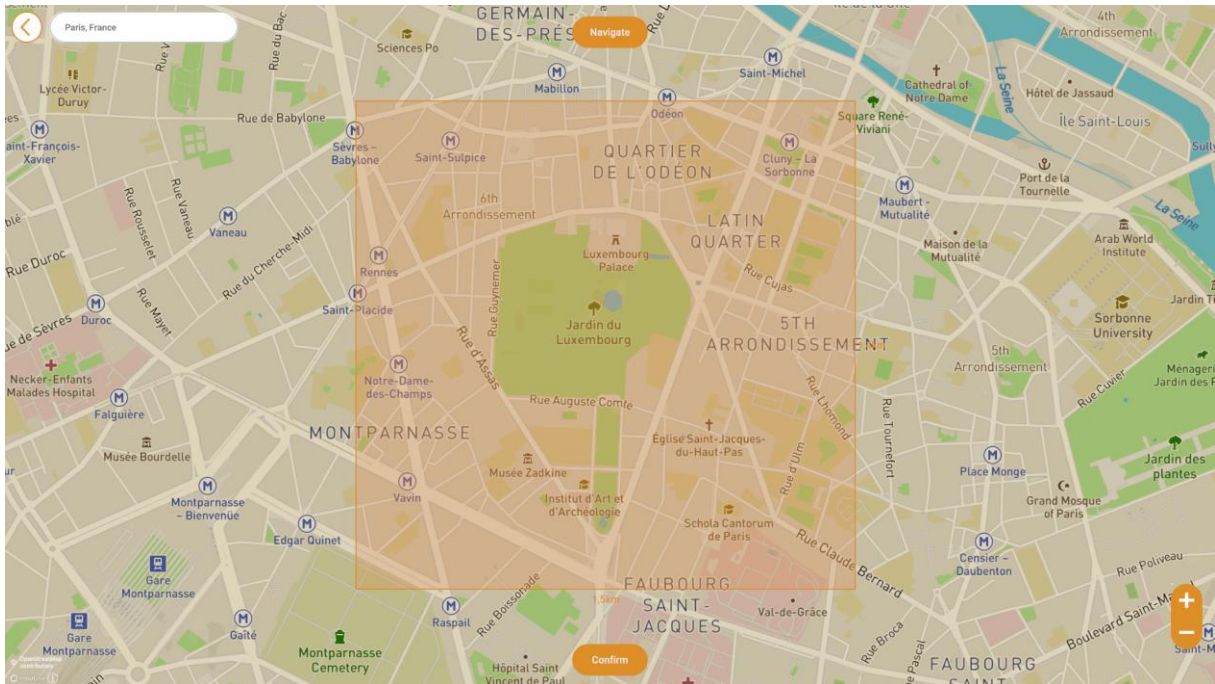

Figure 7 Location Search

Figure 8 Choose location (Data from OpenStreetMaps)
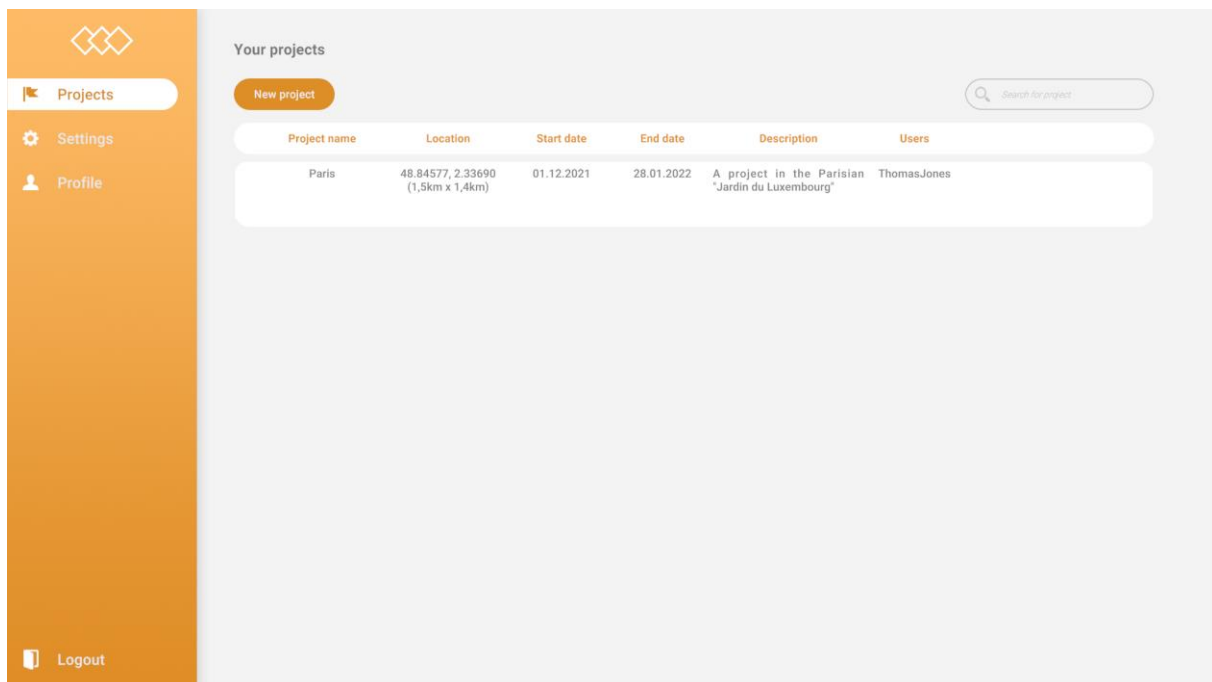

Figure 9 Home screen with project info

Figure 10 Project Info expanded
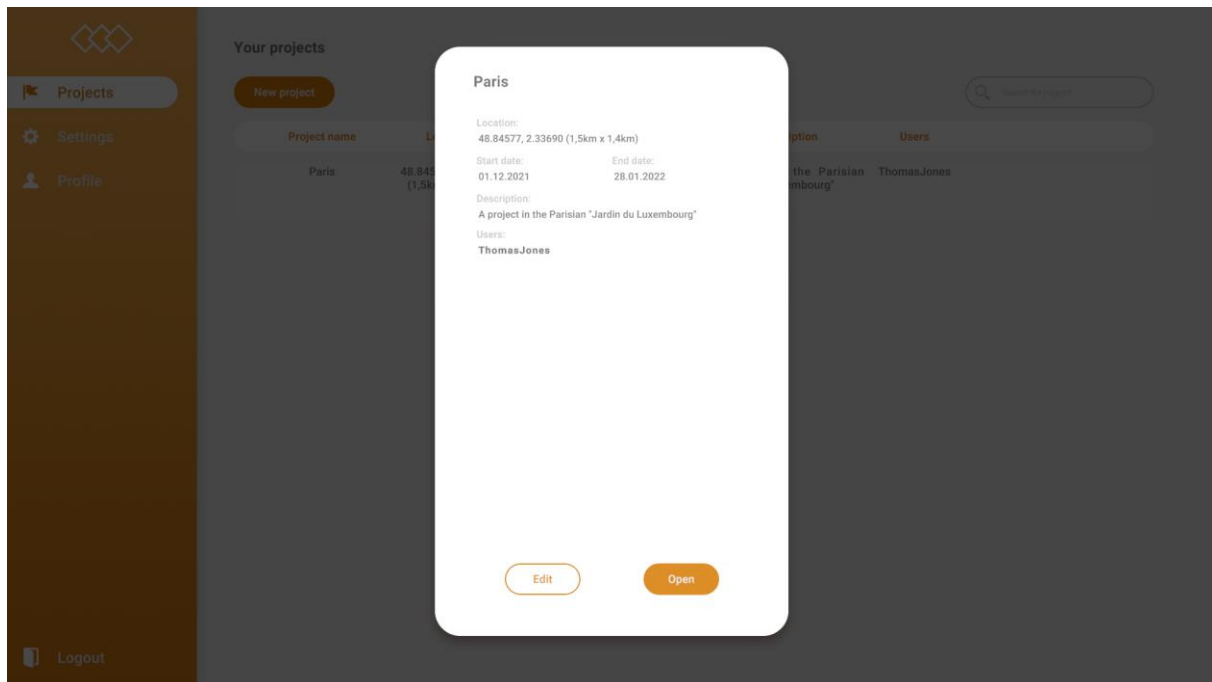

Figure 11 Edit Project pop-up
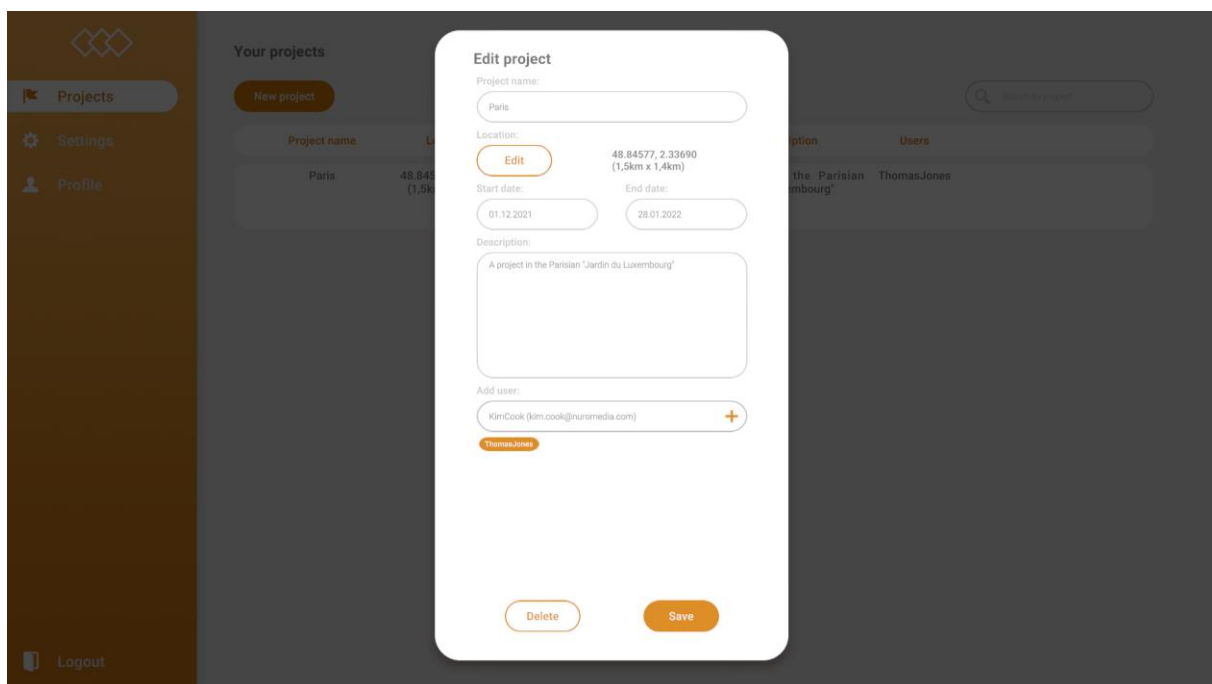
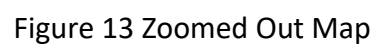Figure 12 Project screen with 3D Map view

Figure 13 Zoomed Out Map

Figure 14 Zoomed In Map

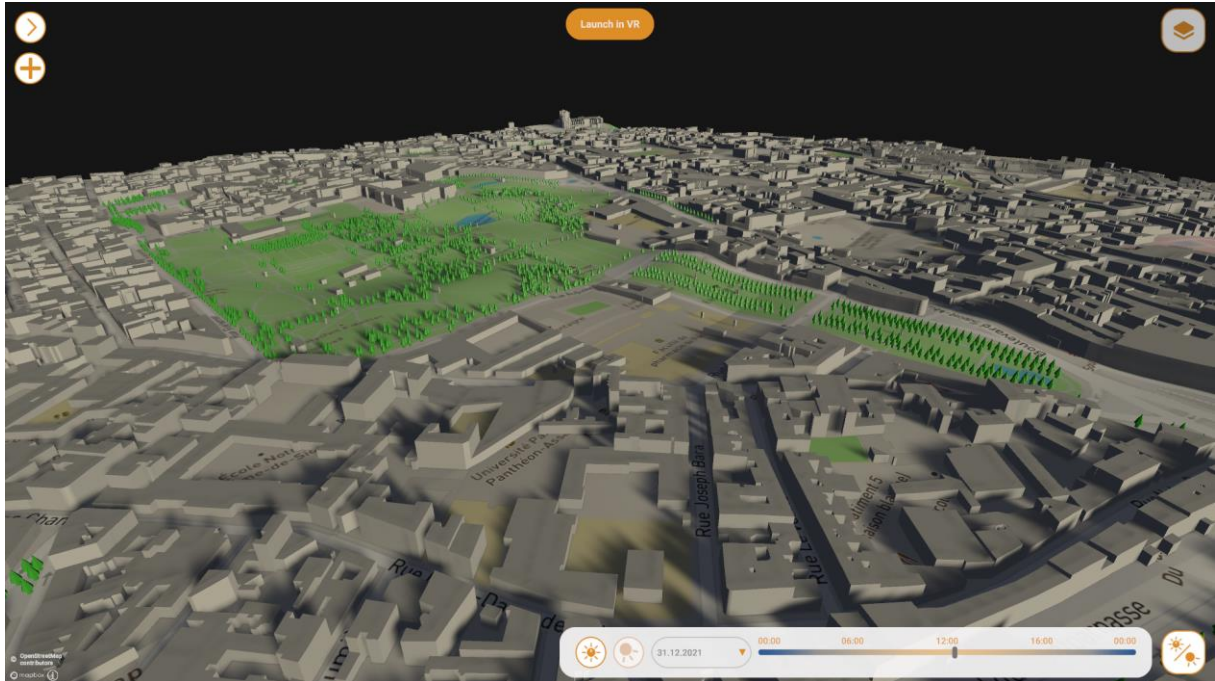Figure 15 Info on Points of Interest

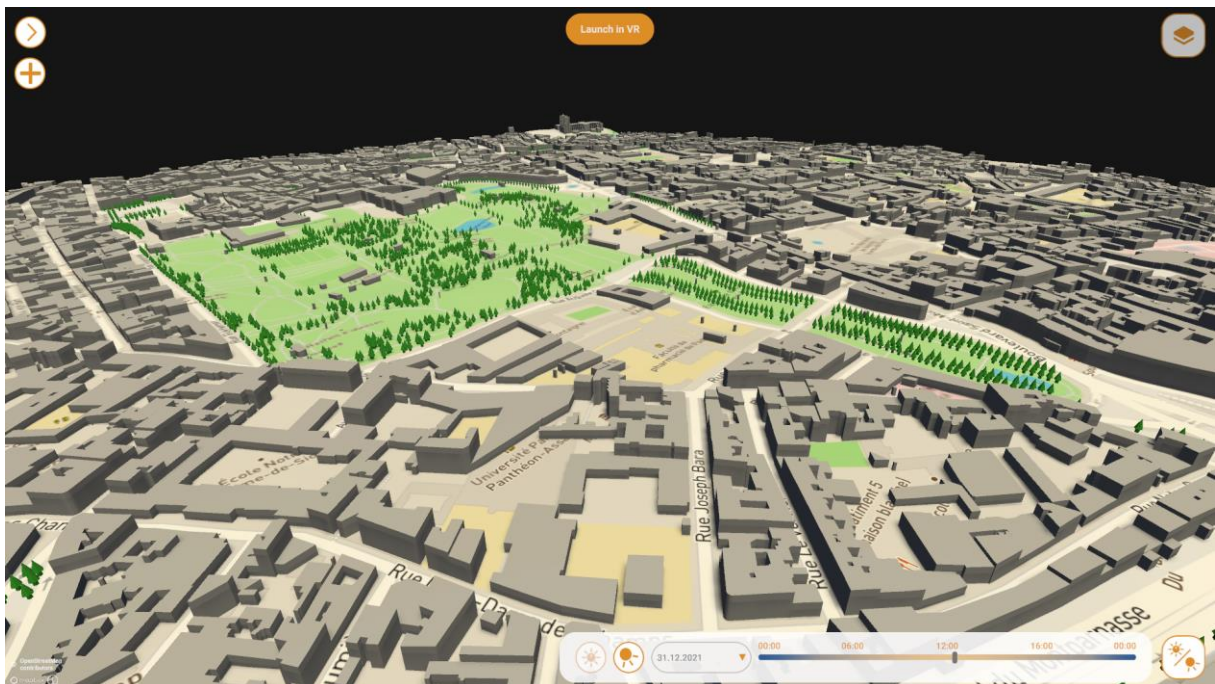Figure 16 Simulation of the city at low sunlight

Figure 17 City with high sunlight
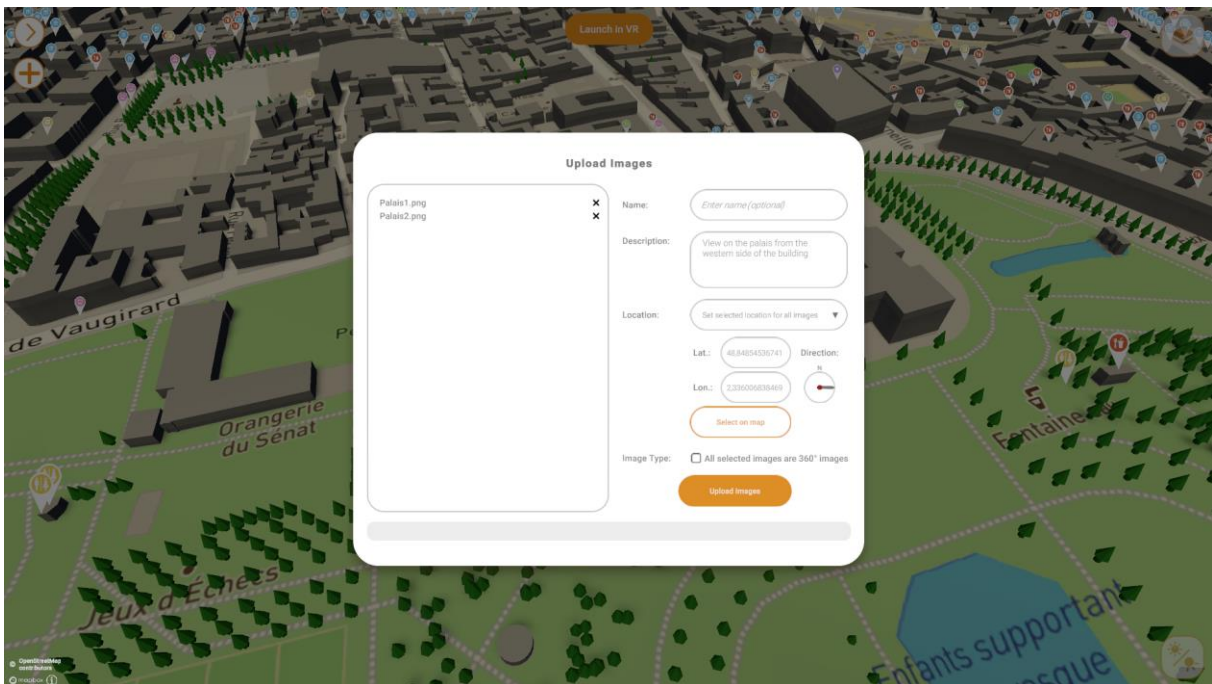
Figure 18 Different layers of the Map

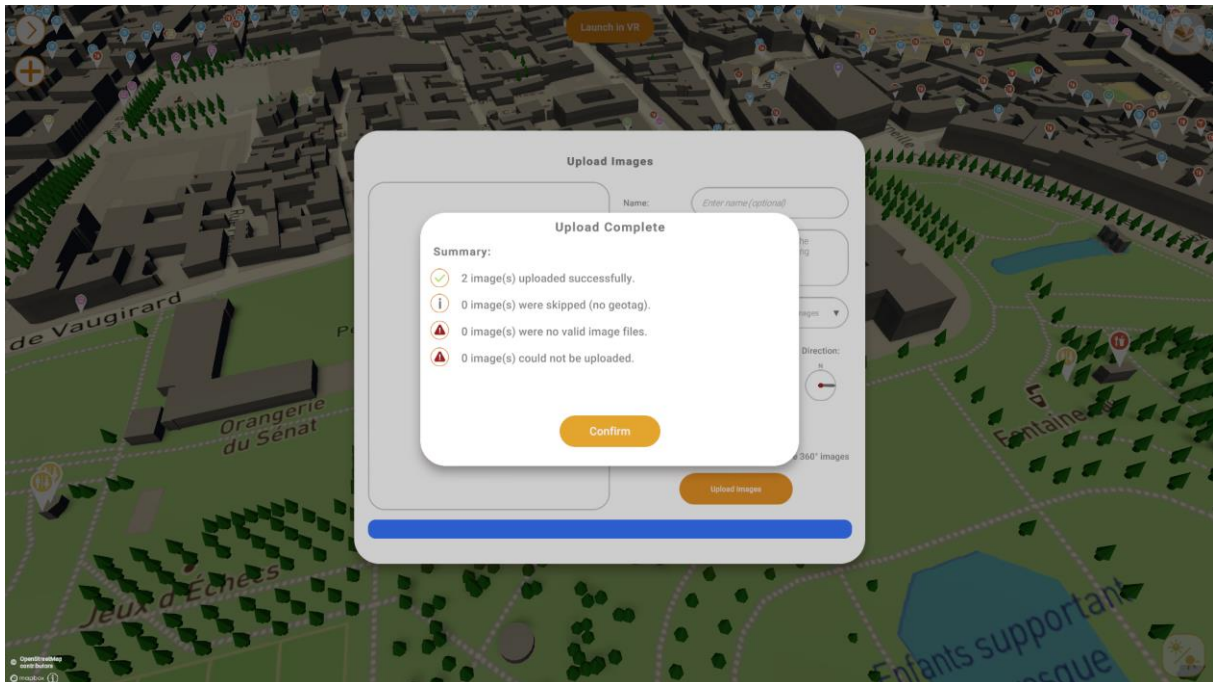Figure 19 Upload Image to a specific location

Figure 20 Completed Upload

Figure 21 Marker Displaying User generated image's location
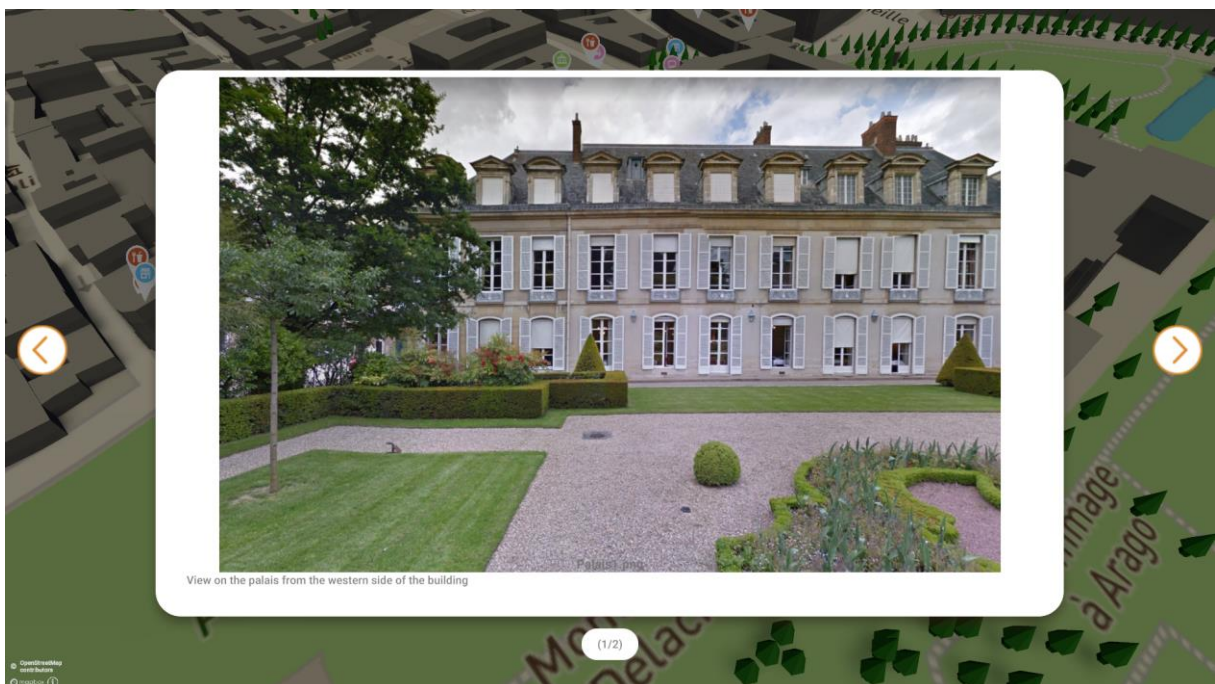
Figure 22 Marker for user uploaded image
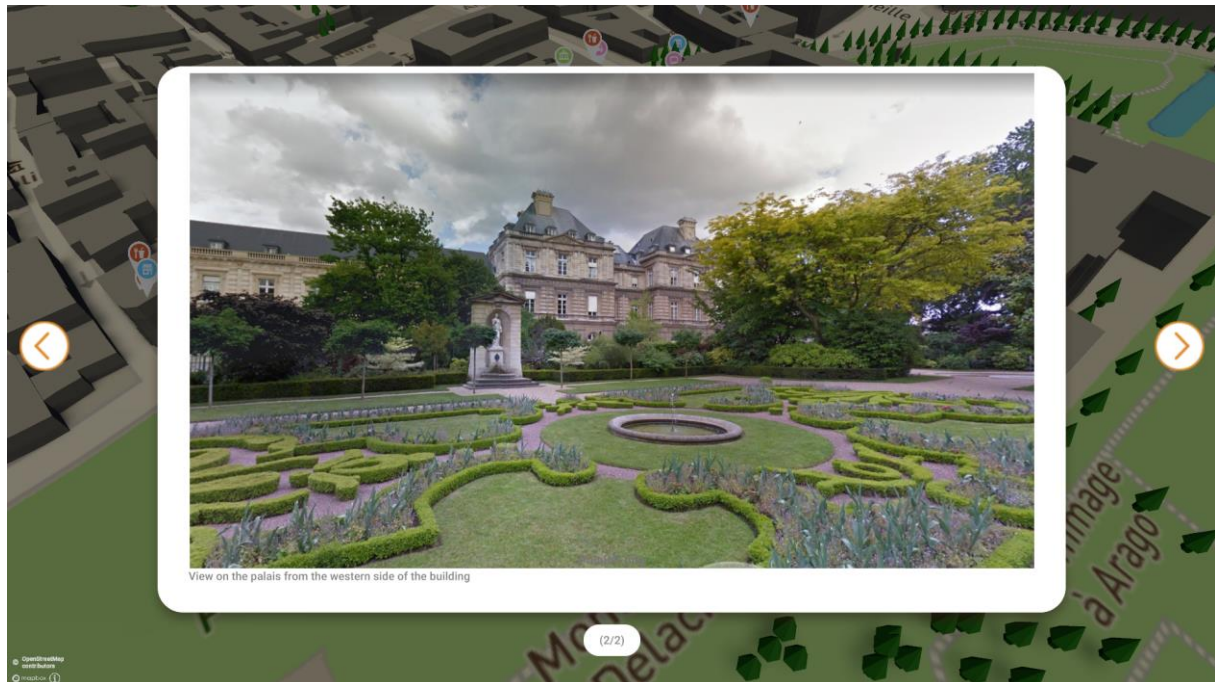

Figure 23 User uploaded image view 1

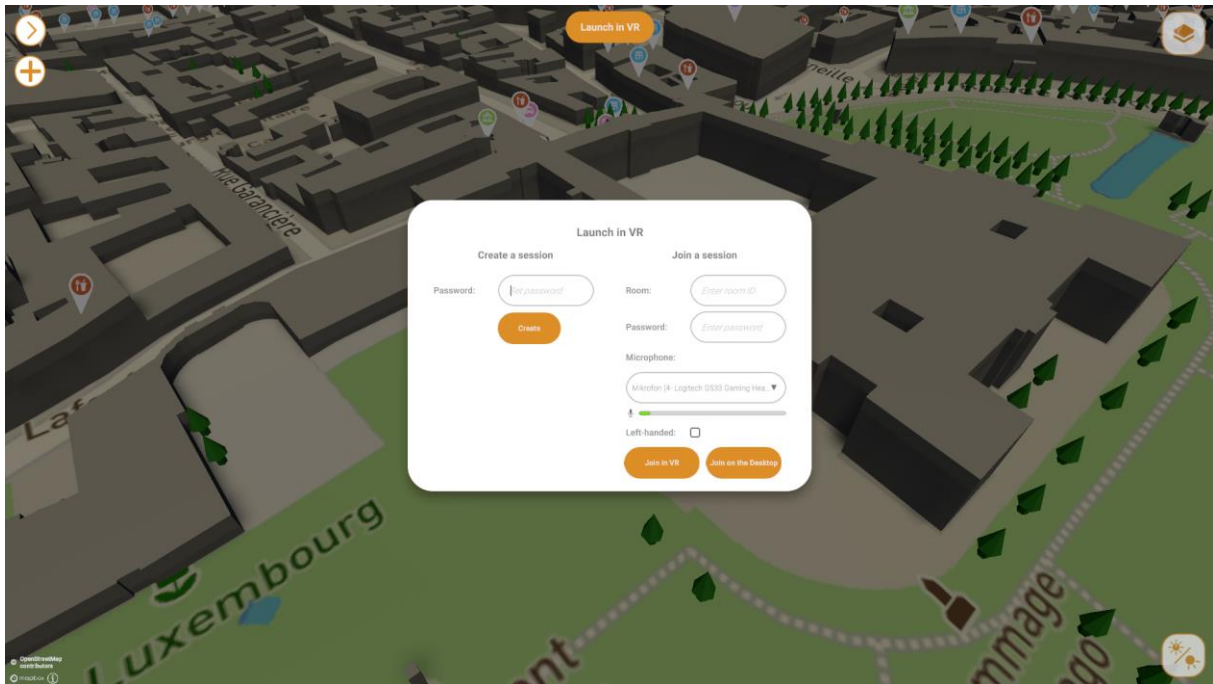Figure 24 User uploaded image view 2

Figure 25 A 360° Image

Figure 26 Launching Collaborative VR Tool

4   FUTURE WORK

In the next version of the app, security will be one of the major updates we will be working on. A more robust authentication method will be used for this. Furthermore, more connections with the GIS servers as well as other components will be made. Lastly, in the next update, we plan to include visualizations for other external data coming from satellite imagery and social media crawling.

More updates to the UI will be made based on the feedback from the user partners.

5 **CONCLUSION**

The deliverable provides an overview on the functionalities implemented in the 1st prototype of the Authoring Tool. The prototype due in the first year of the project will help giving users the initial idea of the main capabilities of the tool. The feedback from the testing phase will help us in improving the performance of the tool.

The next prototype will include new features such as notifications, multiple projects opening at the same time and sharing of data with other visualization tools of the platform.

The tool comprises one of the main interfaces for the xR4DRAMA platform. In the next deliverable, the final prototype will be provided including the aforementioned features and inputs from the users.