Project co-financed by the European Regional Development Fund

HERIT DATA
Pilot Sites / Snap4City

HERIT DATA FINAL CONFERENCE

7th April 2022

Joan Meseguer Llopis

FUNDACIÓN VALENCIAPORT

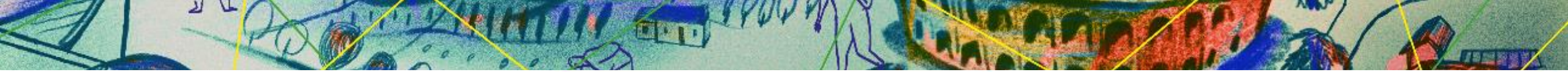
HERIT DATA

Innovative solutions to better manage tourism flows impact on cultural and natural heritage sites through technologies and big data

HERIT DATA aims to **develop sustainable and responsible tourism management towards cultural heritage**, including UNESCO World Heritage sites in MED territories.

In particular, **by leveraging technology and innovation in management tools**, through the use of open data and Big Data.

HERIT-DATA CONSORTIUM AND PILOTS



Florencia

Selection and acquisition of data, to monitor flows of people via cameras, wi-fi access points, sentiment analysis, etc..

Valencia

Sensors for monitoring cruise ship flows
Sensors for heritage impact monitoring (Basilica)
Cruise management platform

Dubrovnik

Six counting cameras placed at all entrances and exits of the historic core of Dubrovnik.

Mostar

Monitoring of the capacity of the Old Bridge and the influx of tourists in the Old Town area by means of 2 counting cameras.

Pont du Gare

Monitoring of visitor flows with cameras, webcams, echo-sensors and statistics, at access points, car parks, the bridge, the river Gardon, as well as at viewpoints.

Antigua Grecia

Collect data by installing cameras and sensors at the sites o the ancient city of Olympia, the temple of Apollo Epicurus and the port of Katakolo.

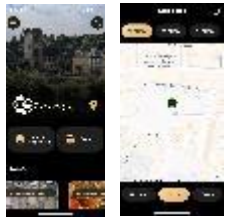
Https://www.snap4city.org

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MzExNQ==

Florence Pilot in a nutshell

Objective:

Managing of tourists/people flows in Florence heritage sites/UNESCO area, promoting the use of Open/Big/Smart Data and ICT tools to interact with the city.

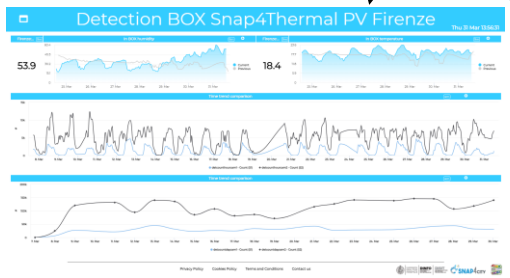


App

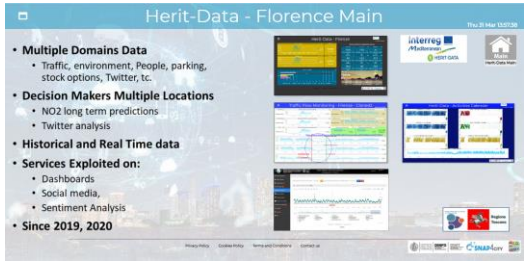
SNAP4CITY

Platform

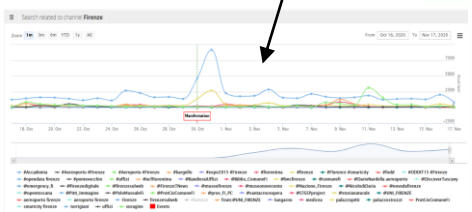
Thermal cameras

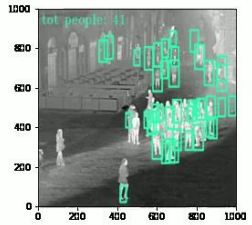


Florence main



Sentiment





Technologies/Data/Sensors/Sources used:

- WiFi access points
- Thermal Cameras
- Sentiment analysis
- LoRa and NB-IoT for the sensors to platform communications
- Node-Red for sensors' integration with Snap4City
- Snap4City platform for data storage, processing and visualization of indicators
- Environmental sensors (NO, O_3, NO_2, CO, SO_2)
- Nudging
- Influencer marketing
- Parking lot occupation

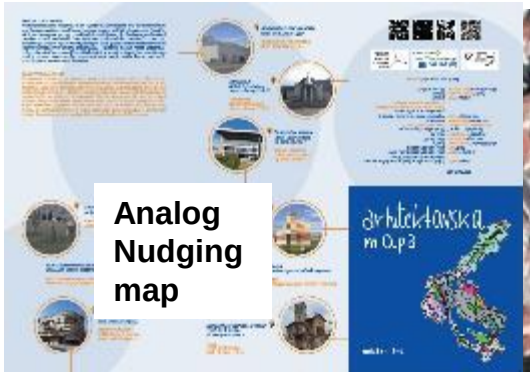
Results:

Real-time monitoring of tourists/people presence and trajectories, behavioural orientation, tourists "mood"/"sentiment" monitoring, parking lots monitoring.

Mostar Pilot in a nutshell

Objective:

Prevent mass tourism negative impacts on the Old Town of Mostar through: smart data use and monitoring, awareness-rising among local stakeholders, and diversification of tourist offer.



Technologies used:

- Snap4City platform for data storage, processing and visualization of indicators

Results:

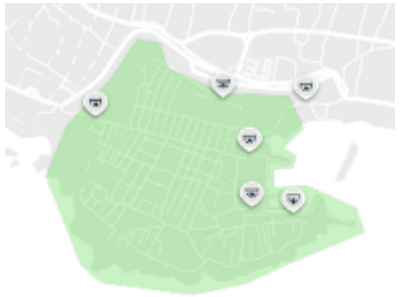
- Database for different types the Snap4City platform analytics that will ensure better management of tourist flows and will help local stakeholders in decision-making processes.
- Thematic cultural routes – nudging maps – and application for tourist that identify and promote different cultural heritage types outside of the Old Town area.
- Awareness- rising among local stakeholders and wider community.
- Technical documentation for installation of counting cameras and real time measurement of tourist flows plan.

Dubrovnik Pilot in a nutshell

Objective:

Monitor the impact of over-tourism in historical core of Dubrovnik and Dubrovnik Rector's Palace

Counting cameras



Crowd management application with elements of augmented reallity

Technologies used:

Counting cameras

- Closed system of six cameras located at the six entrances and exits of Dubrovnik historic core monitors the number of visitors in real time.

Crowd management application

- App gets data about number of people in the museum from WiFi Access Points located in the building. Depending on number of visitors there, short or long version of guide is started.

Snap4City platform is used in both solutions for data storage, processing and visualization

Results:

1.Real-time monitoring of number of tourists in the historical core

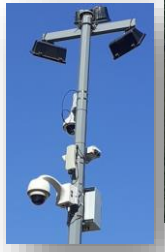
2.Real-time monitoring and crowd management of visitors of Dubrovnik Rector's Palace.

Pont du Gard, Occitanie, Pilot in a nutshell

Objective:

Monitor the flow of tourists on site (arriving by car, bus, bike, canoe, on foot) in order to facilitate decision making and redirect the visitors to less crowded parts.

Installation of 8 Eco sensors and 7 cameras



Webcam

Camera s

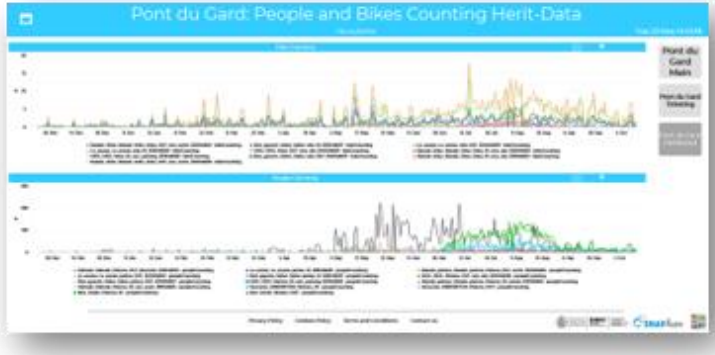
Eco sensors

Material installed :

- **Ecosensors** (classical and PYRO last generation)
- **Webcam** (transmission near real time – delayed 20 minutes in transmission because of security issues)
- **Cameras** (classical and augmented with artificial intelligence for counting people for statistic use only)
- **Web App "Pont du Gard Tour"** in French and English https://www.pontdugardtour.fr/en

Results:

- Real time **monitoring** of visitors at key points of the site
- Improve of **security** on site
- Starting **reorienting** visitors to different viewpoints
- **Statistical** data for **analysis** and **planification**



Discover the Pont du Gard experience :
https://youtu.be/xBlRO9HsCJM

HERIT DATA Project – Ancient Olympia in a nutshell

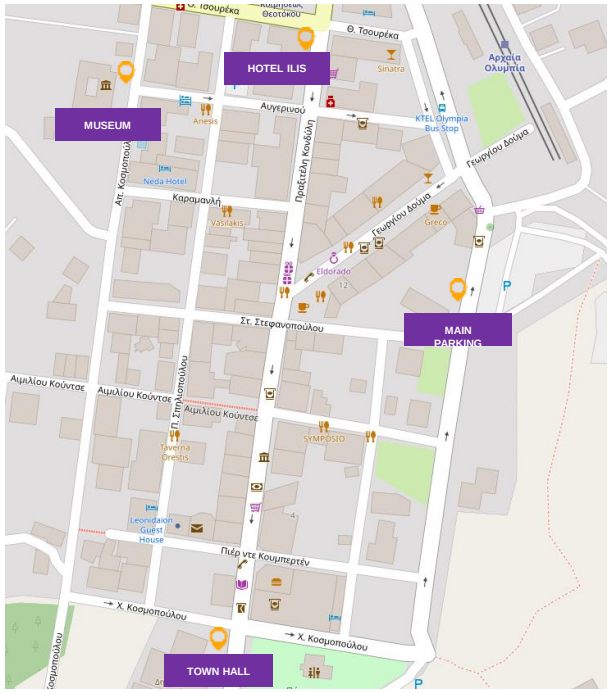
Objective:

Monitor the impact of over-tourism in heritage sites in Ancient Olympia and Katakolo port with special attention to the impact from cruise tourism

Technologies used:

- Dual lens network camera for people counting
- LTE router for remote connection via 4G
- Centralized platform for data storage, processing, monitoring and analytics

Sensors' installation:



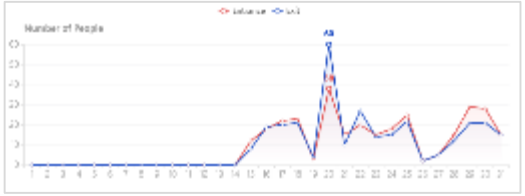
Dual lens camera and LTE router

Results:

Real-time monitoring of: analytics of tourists and cruise passengers in 6 locations.

Hotel Ilis

Town Hall

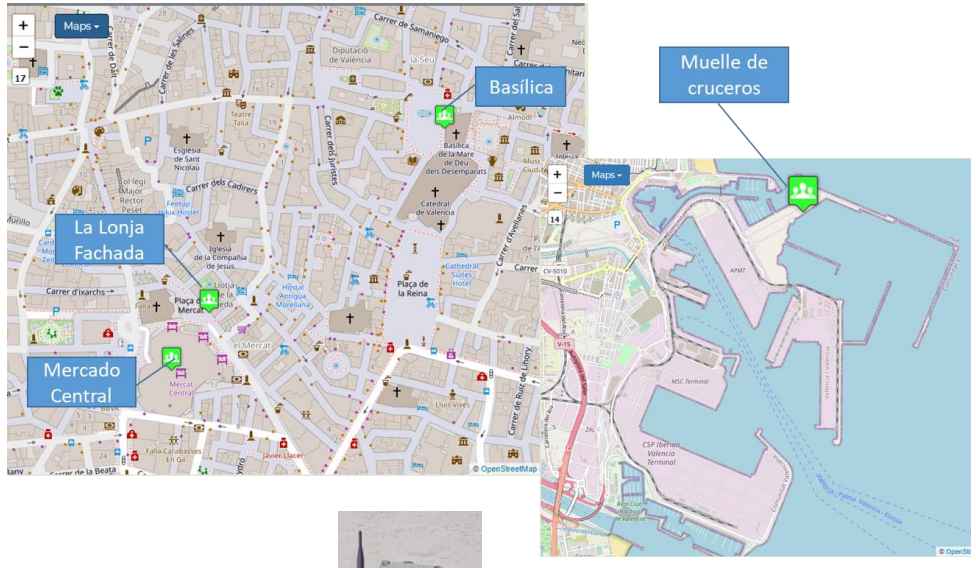


Valencia Pilot in a nutshell

Objective:

Monitor the impact of over-tourism in heritage sites in Valencia with special attention to the impact from cruise tourism

Sensors' Installation



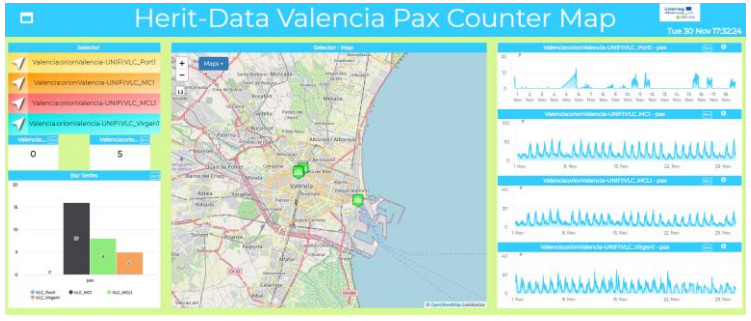
(WiFi) PAX counter sensor

Technologies used:

- Environmental sensors for heritage conservation: Temperature (approx. 18 sensors), Humidity (approx. 18 sensors), Luminosity (approx. 6 sensors), CO2 (approx. 3 sensors), Weather station (1 sensor), NO, O3, NO2, CO, SO2 (1 sensor)
- WiFi-based PAX count sensors (x6) for affluence monitoring
- LoRa and NB-IoT for the sensors to platform communications
- Node-Red for sensors' integration with Snap4City
- Snap4City platform for data storage, processing and visualization of indicators

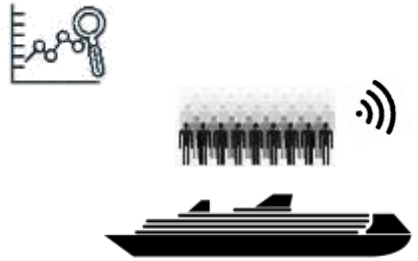
Results:

Real-time monitoring of: building/site capacity indicators, tourist city flows indicators and number of tourists and cruise passengers in 5 locations.



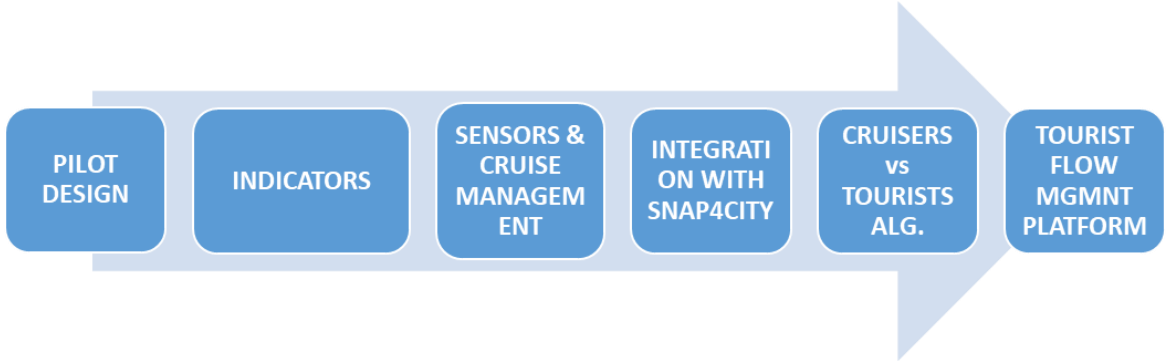
Valencia Pilot: solution proposed

1. Data capture:
   a) Analysis of the main indicators to be measured
   b) Installation of People Counting Sensors (PAX)
   c) Installation of environmental sensors
   d) Digitalization of the cruise management process



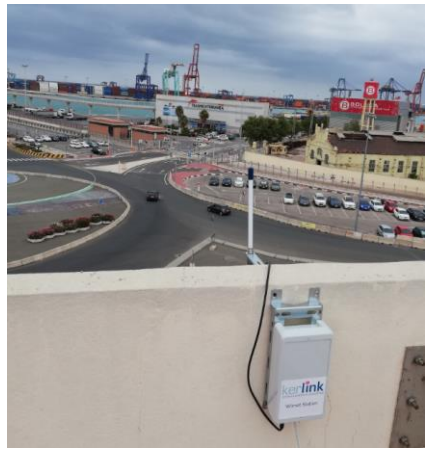
2. Integration of data sources (cruise management platform, PAX sensors, environmental data, etc.)
3. Differentiation of crusiers and tourists algorithm development
4. Data is sent to the Snap4City platform

5. Visualization of data and indicators
6. Web App for cruisers



Valencia Pilot: Sensors & Cruise Management Platform

One of the key points of the pilot is the **acquisition of primary data collected** directly **by sensors** located at different sites in Valencia.



E.1. Building /site capacity overcrowded

- Monitoring environmental parameters of a heritage buildings (temperature, humidity, luminosity, gases, etc.)
- Num. people / m^2

E.2.Tourist City Flows

- WIFI sensors installed in entrance of heritage buildings, transit points and access points to the city (e.g. port)

In collaboration with: DIPUTACIÓ DE VALÈNCIA — Colze a colze amb els Ajuntaments

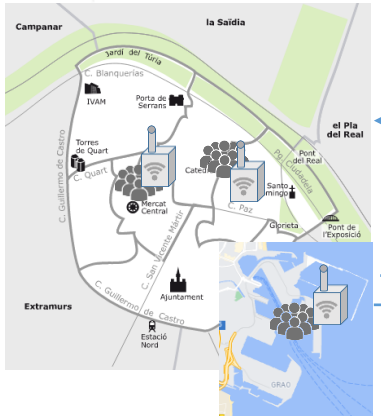
valenciaport — Autoridad Portuaria de Valencia

Development of the Cruise Management Platform

- A platform will be develop to facilitate the interconnection between cruise stakeholders and PAV. Some relevant data will be shared for the predictions and indicators

Valencia Pilot: Architecture

LoRa NB-IoT



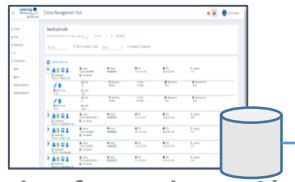
Node-RED

b) Register port's staff

Node-RED

c) Register cruise passengers

BBDD MySQL



Plataforma de gestión de cruceros

Local IoT Middleware Platform

Node-RED

a) PAX counting

Dashboard de conteo de personas

Node-RED

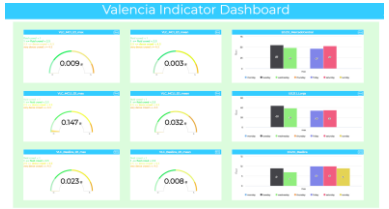
d) Cruise passengers counting

Dashboard de conteo de cruceristas

Web App

Node-RED

e) Herit-Data indicators



Dashboard de indicadores

SNAP4CITY

Interreg Mediterranean HERIT-DATA

Project co financed by the European Regional Development Fund

Valencia Pilot: Snap4City IoT Directory and Devices

An embedded tool for managing the IoT devices:

- Definition of pilots' sensors within the platform
- Definition of pilots' data models of messages coming from pilots' sensors
- Definition of data broker to receive and store data from sensors

Usage within pilot:

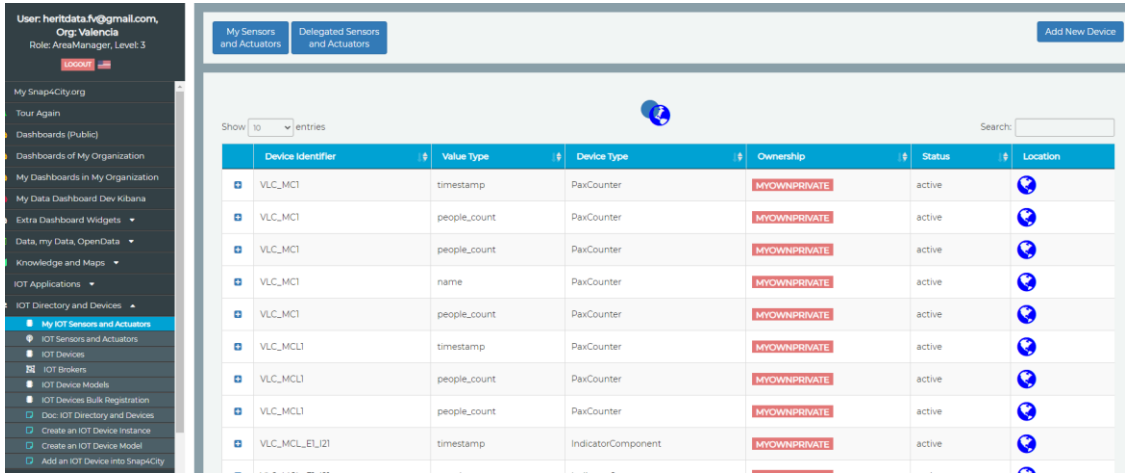
a) Definition of PAX counting sensors (connectors)

b) Definition of PAX sensors' data models

c) Definition of environmental sensors (connectors)

d) Definition of environmental sensors' data models

e) Creation of Valencia Pilot broker



Valencia Pilot: Snap4City IoT Applications

An embedded web-based tool used for data pre-processing:

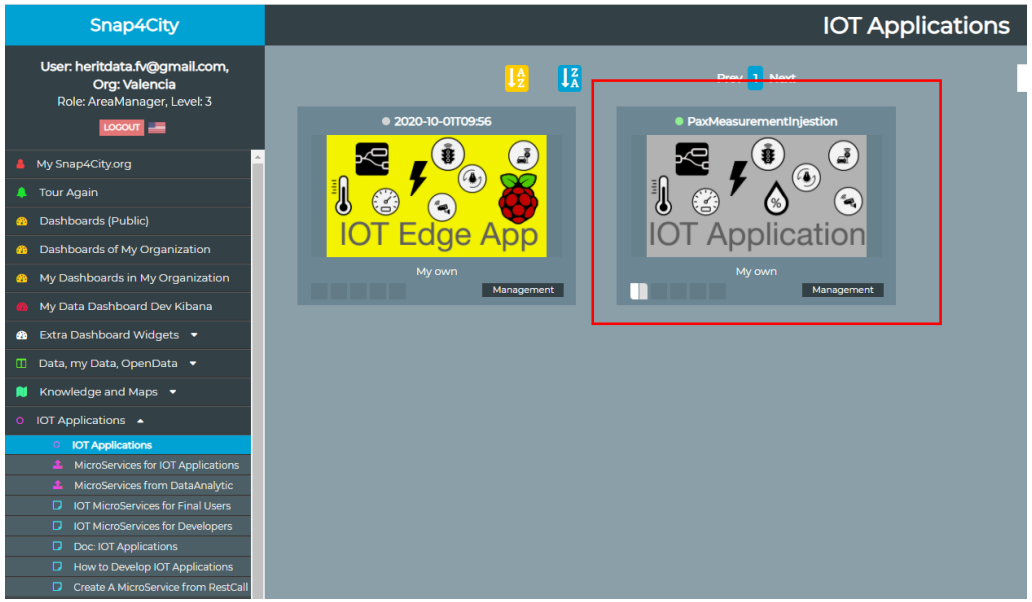
- Data ingestion
- IoT message tranformation
- Data collection
- …

Usage within pilot:

a) PAX counting data collection from sensors and injection to dashboard

b) Cruise passenger data collection and injection to dashboard

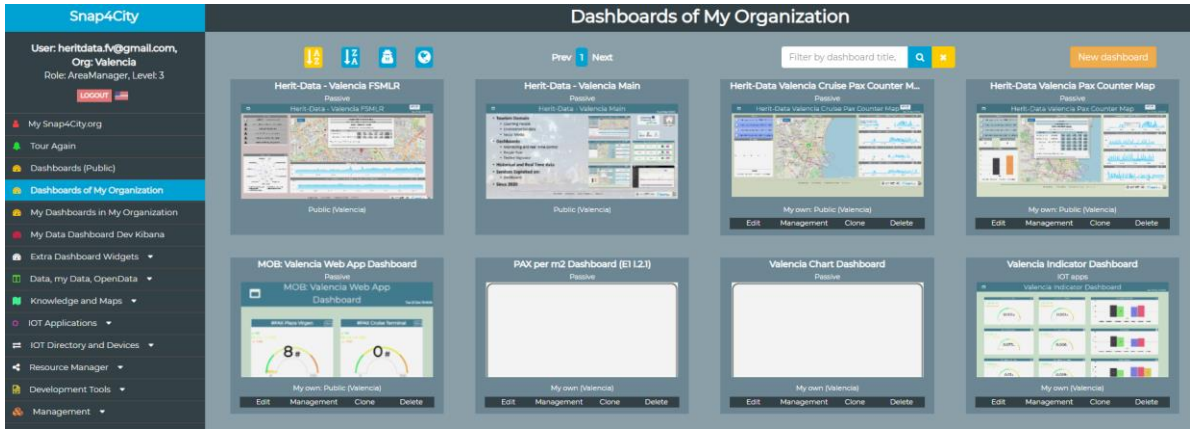
c) Herit-Data indicators computing and injection to dashboard



Valencia Pilot: Snap4City Dashboards

An embedded web-based tool used for dashboard creation and management:

- User-friendly creation of customized dashboards
- Many widgets available
- Life-cycle management of dashboards (publish, start, stop, delete, etc.)



Usage within pilot:

a) Creation of PAX Counter Map

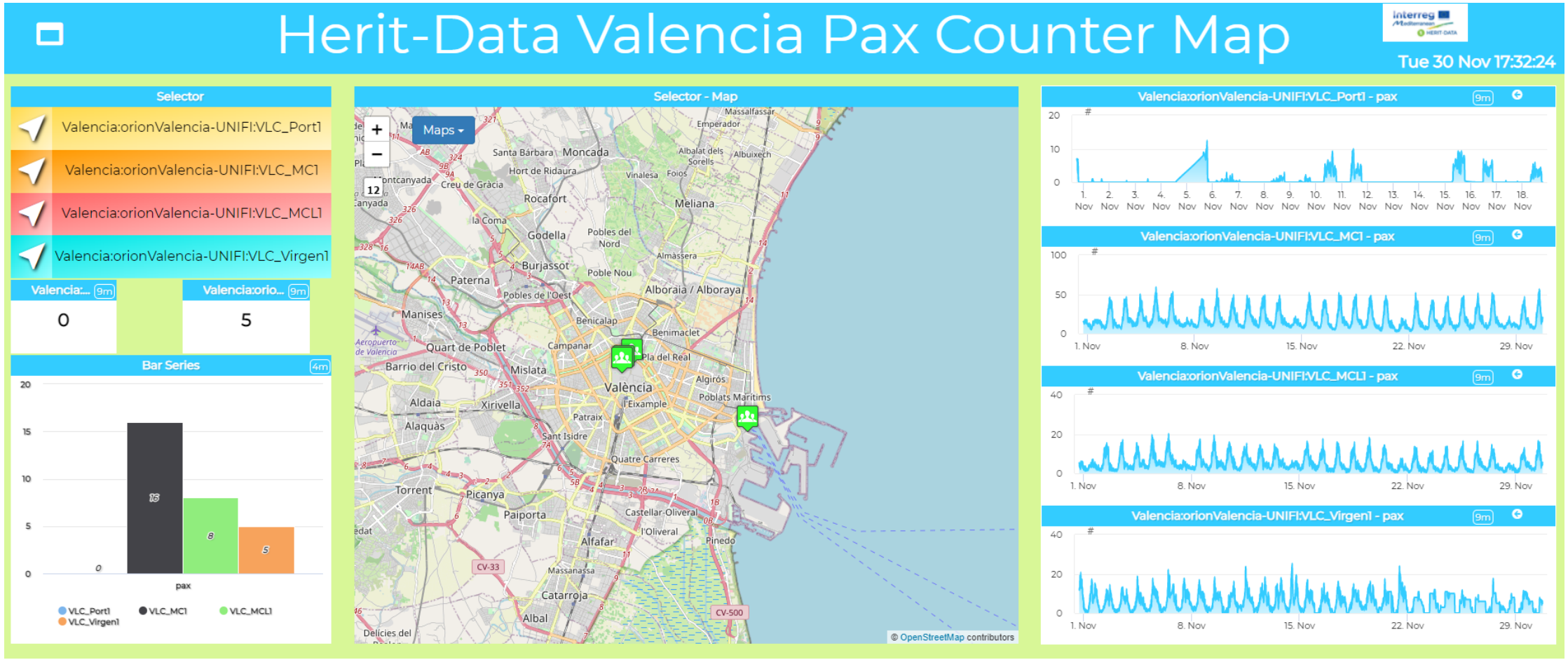
b) Creation of cruise PAX Counter Map

c) Creation of building heritage monitoring dashboard

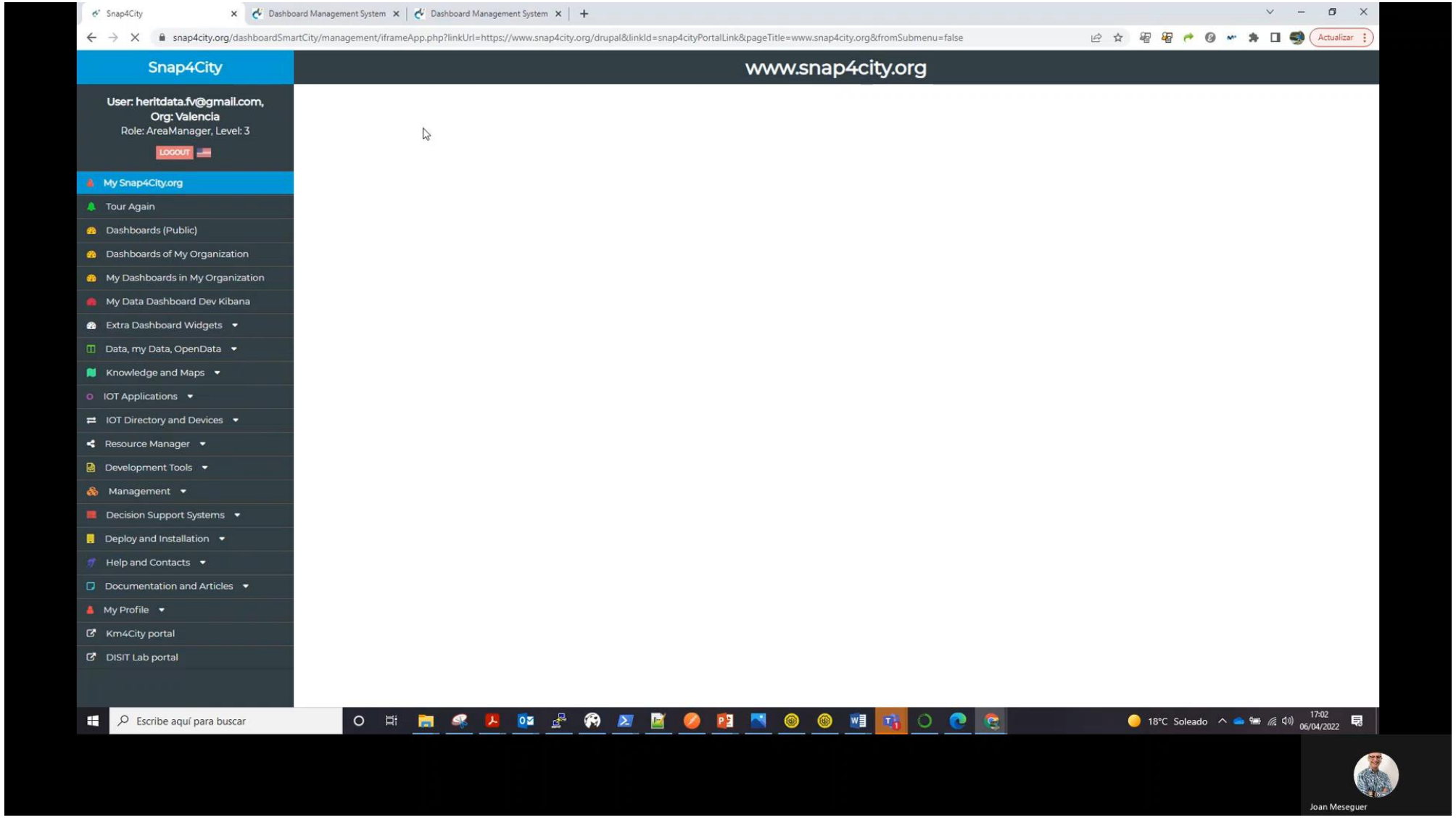
d) Creation of Valencia Pilot Indicator Dashboard

e) Creation of Valencia Pilot Map

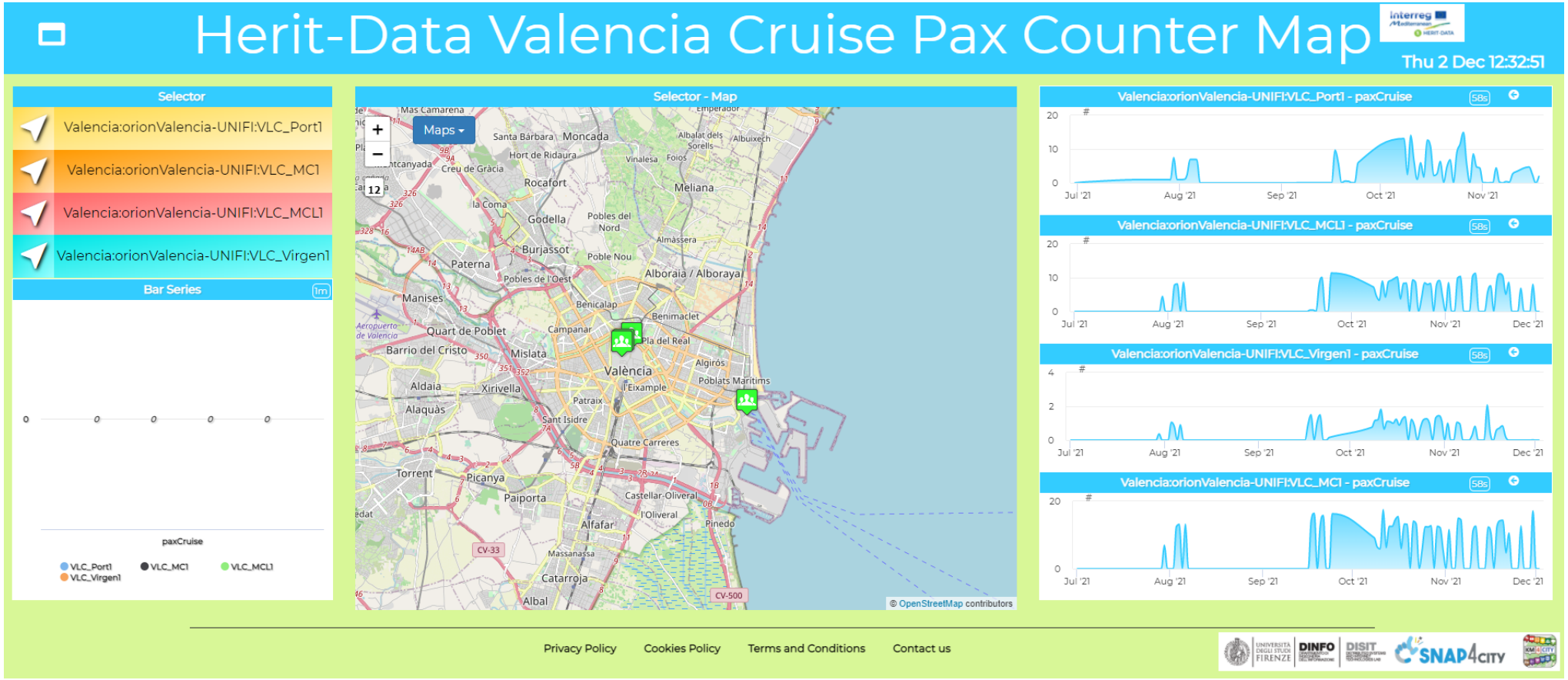
Valencia Pilot : Dashboard (tourists)



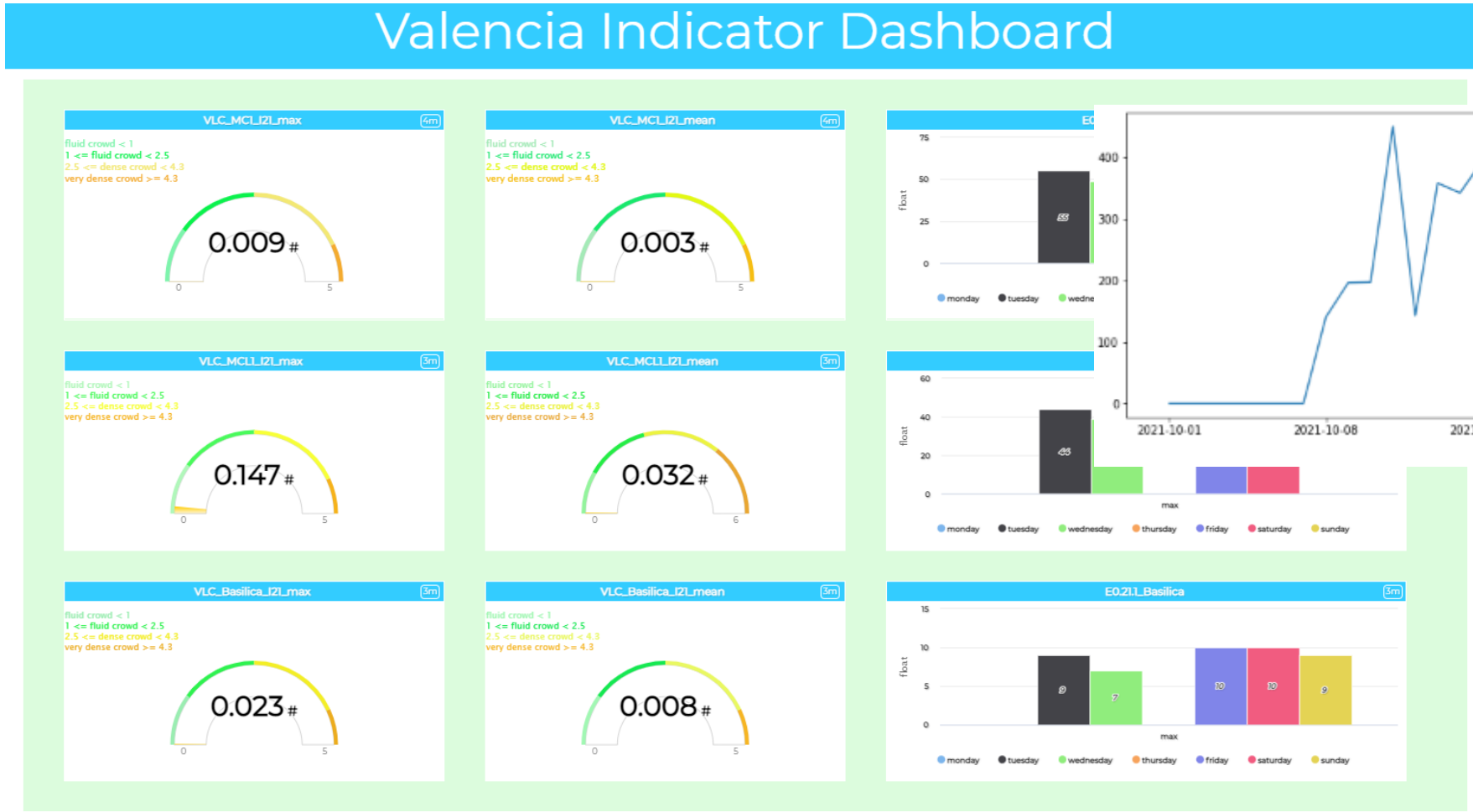
Valencia Pilot : Snap4City Demo

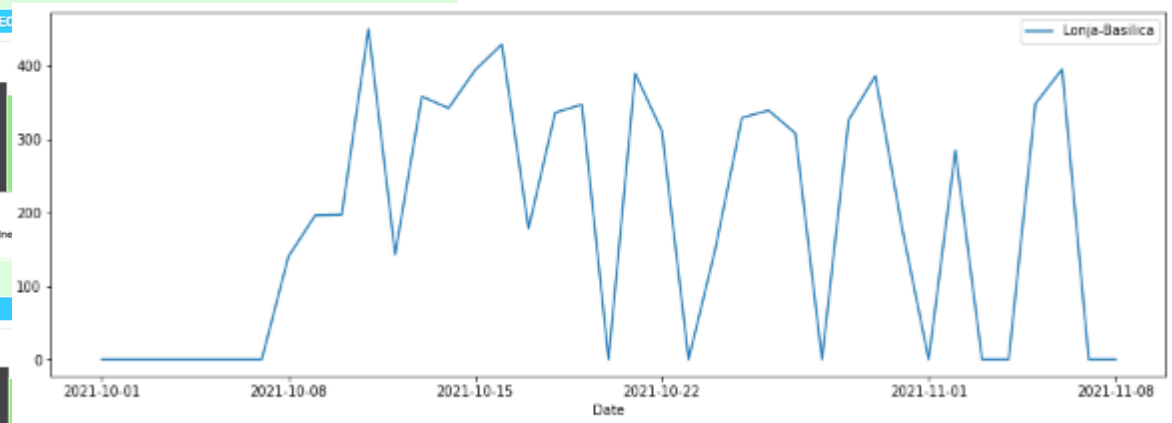


Valencia Pilot: Dashboard (cruisers)



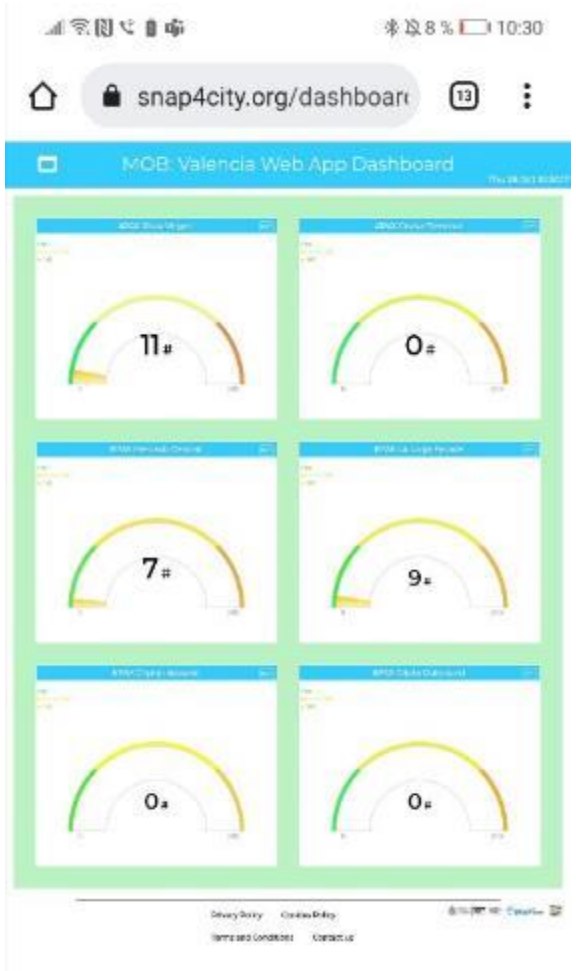
Valencia Pilot: Dashboard (Indicators)





Number of people in transit between La Lonja and La Basilica in September and October

Valencia Pilot: Web App



Web App view

Snap4City dashboard management

Project co-financed by the European Regional Development Fund

Contacts:

Joan Meseguer Llopis

jmeseguer@fundacion.valenciaport.com

https://herit-data.interreg-med.eu/

@heritdata

www.linkedin.com/in/herit-data/

THANK YOU FOR YOUR ATTENTION!