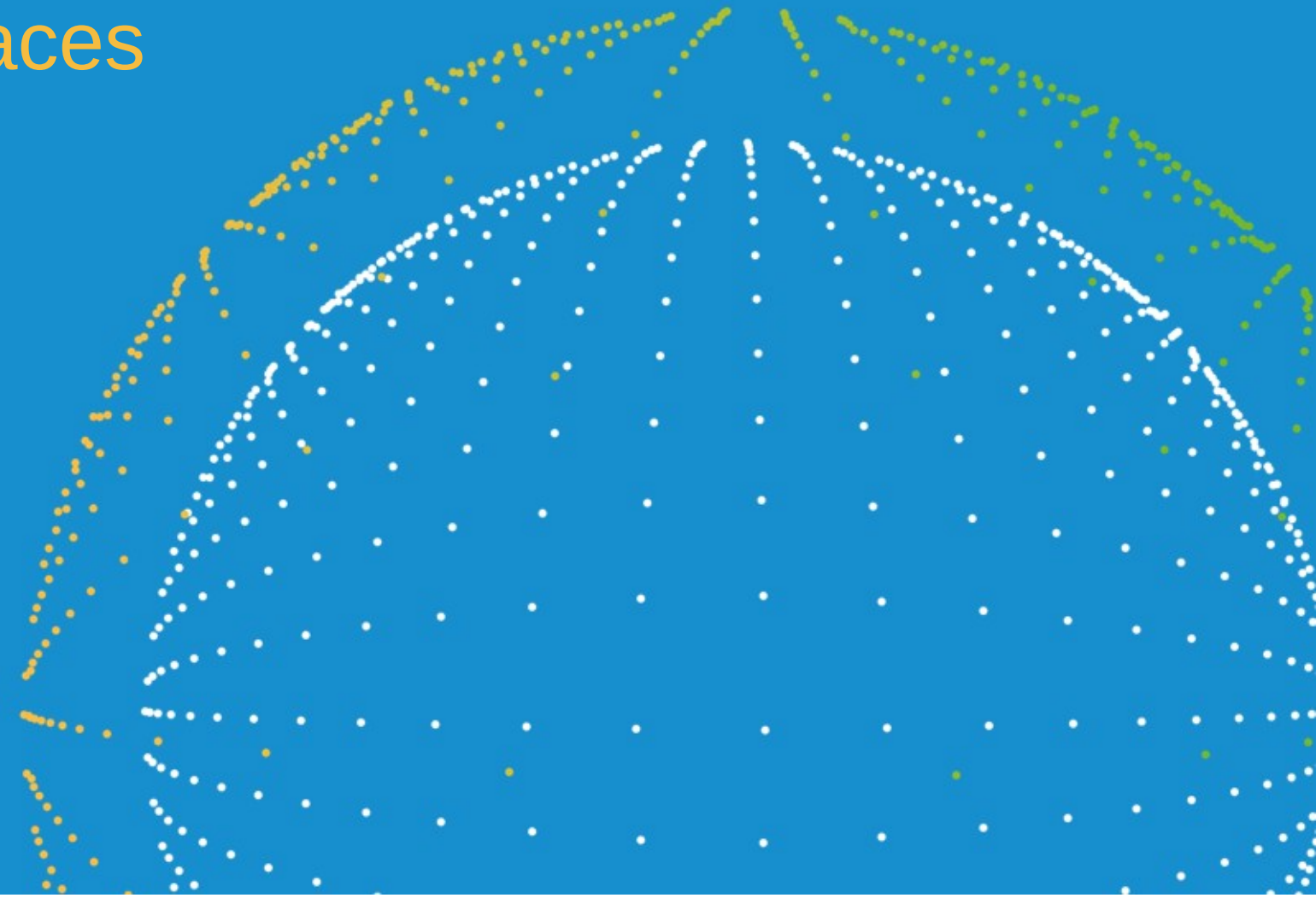


Data Spaces Symposium

Showcase: Interconnecting Valencia
platform to a data spaces

Iris360

Africa Arevalo
Antonio Jara
Libelium





An **infinite space** of possibilities that allows you to get the most out of your data thanks to the IoT potential provided by the market leader **Libelium** with more than **16 years of experience** in high tech.

Combines advanced Technology with the intelligence of the people behind the Technology.

Unites the necessary infrastructure layer with the right insights for your company, while meeting all the compliance requirements you need.

Allows you to make data-driven decisions in an automated and efficient way.

Modular
and flexible
Dataspace



Urban Health:
Air & Noise
monitoring



Urban Mobility
Parking,
Digital Signaling



Smart
Tourism
Solutions



Smart Buildings



Crowd
Monitoring



Water
Management
City Parks and
Green Areas



Digital
twins/Metaverse
Experience



End User
Services



RELIABLE

- Advanced Device Management.
- Remotely manage all your devices.
- Programming of sensor devices for remote configuration (FOTA).
- Devices maintenance (OMA LwM2M).
- Data Quality Enhancement (IEEE 2510).



SECURE

- ISO 27001 and the highest level of security (ENS High level - Certified).
- Role levels management
- Add users with different roles & permissions.
- Premium technical support service contracting
- Data storage for historical data (traceability).



INTEROPERABLE

- Data Spaces (MIM1 and MIM2).
- Context API (ETSI NGSI-LD)
- Smart Data Models (Semantics)
- Powered by FIWARE platform.
- Create projects by grouping devices, connectors, and dashboards.



EXTENSIBLE

- AI on Demand (AIoD)
- Send data to the main Clouds in the market and MQTT and HTTPS
- Data-oriented platform. Configurable search by data series, range, date, intervals and other parameters.
- Edge Computing support.

FEATURES



Semantic Vision

Data-centric architecture with semantic vision to build business models



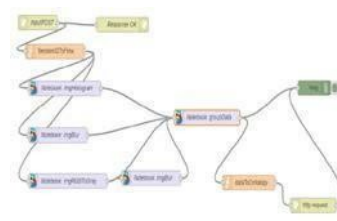
Data Integration for IoT and non IoT Protocols

Intake of information from heterogeneous sources and protocols



Data Integration & Data Normalization

Events management through the orchestration of actions



Analytics & Intelligenc

Business decision-making based on Grafana dashboards



AI on Demand

Flexibility for visually analytical or real-time dashboards



FEATURES



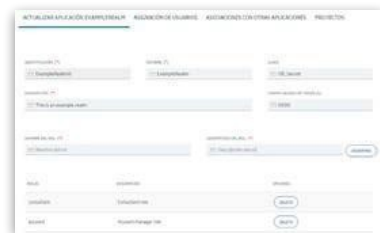
Data Spaces Connectors

Publishing data datasets for use and integration by third parties



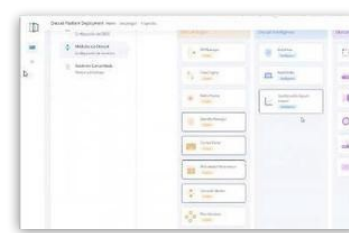
Integrated Security

Securitization of components and functions to prevent cyberattacks



Hybrid deployment

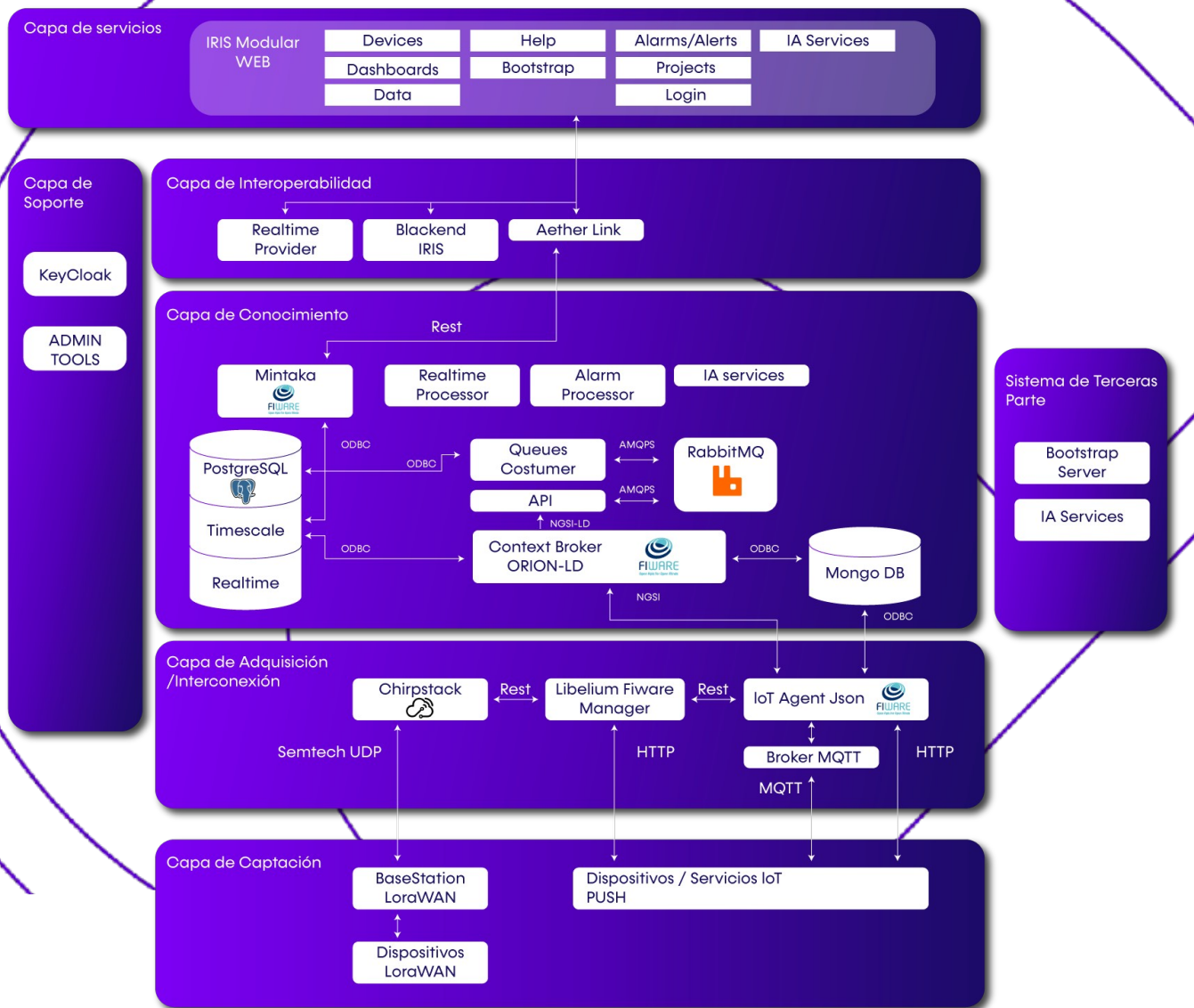
Automate deployments Hybrid System
Deployment Model: Cloud and On-premises



Devices management

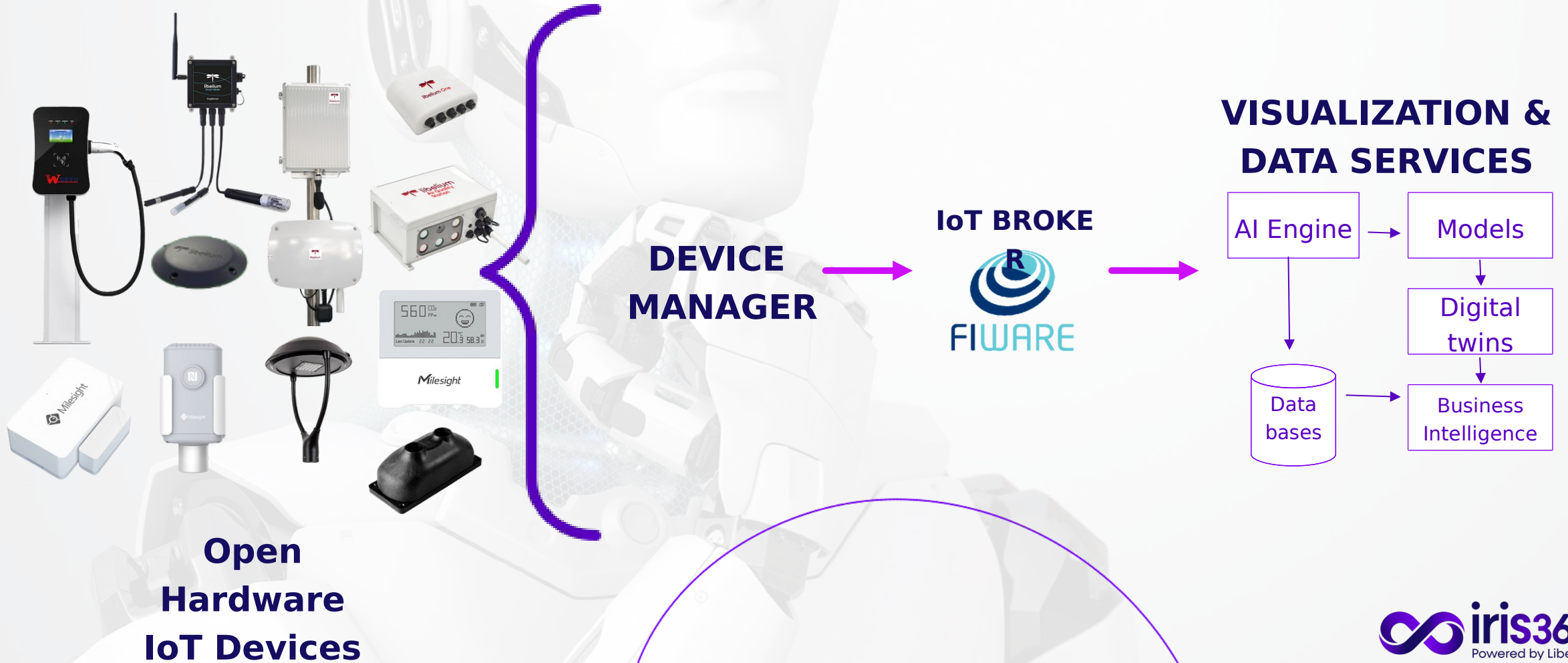
Tools to manage devices, connection, and workloads.





ARCHITECTURE

STRUCTURE



REPORT



S Data Accuracy



CERTIFIED REPORTING

Validation of accurate contextual data represented & and elaboration of issue status reports



Compliance



ALIGNMENT WITH EUROPEAN DIRECTIVES

Aimed at improving air quality and **national equivalents**, a series of data quality criteria are established, as well as air quality indicators and limits for the different pollutants.



Audited action



INFORMED DECISIONS IN URBAN DEVELOPMENT

Action plans based on contextual analysis and prediction models

3.1. Conectividad y disponibilidad. SLA del tiempo de funcionamiento

ACQN 01	TIEMPO ONLINE	73,41%	TIEMPO OFFLINE	27,59%
Número de desconexiones	273	Tiempo medio de desconexión		23,86min
Máximo tiempo conectado	15,44 h	01/07/2023 00:00:00 al 01/07/2023 01:22:22		
Mínimo tiempo desconectado	196,43 h	07/02/2023 13:42:55 al 01/07/2023 08:32:25		
ACQN 02	TIEMPO ONLINE	99,01%	TIEMPO OFFLINE	0,99%
Número de desconexiones	49	Tiempo medio de desconexión		8,00 min
Máximo tiempo conectado	71,46 h	24/07/2023 01:33:50 al 28/07/2023 01:13:42		
Mínimo tiempo desconectado	6,91 h	01/01/2023 00:00:00 al 01/07/2023 04:56:44		
ACPM 03	TIEMPO ONLINE	99,11%	TIEMPO OFFLINE	0,88%
Número de desconexiones	173	Tiempo medio de desconexión		2,30
Máximo tiempo conectado	23,86 h	24/07/2023 01:33:50 al 01/07/2023 01:13:42		
Mínimo tiempo desconectado	5,81 h	01/07/2023 00:00:00 al 01/07/2023 05:38:38		
ACQN 04	TIEMPO ONLINE	98,56%	TIEMPO OFFLINE	1,44%
Número de desconexiones	1052	Tiempo medio de desconexión		6,5 min
Máximo tiempo conectado	25,44 h	01/01/2023 07:22:34 al 01/07/2023 01:48:33		
Mínimo tiempo desconectado	1,64 h	01/01/2023 00:00:00 al 01/07/2023 01:29:22		

Nota: Online = más del 99% de las desconexiones son de 1s, introducidas en el Sistema por gestión del dispositivo para asegurar la conectividad del sistema, ya que obliga al equipo a reiniciar conexión de manera automática.

3. Evolución de los niveles de contaminantes

3.1. Niveles de superaciones de gases Real Decreto 1027/2010

En este apartado se mostrará una tabla indicativa, desde su inicio, la media y el valor máx. horario durante el periodo mencionado, así como las superaciones de los límites establecidos para el cumplimiento de los objetivos de calidad del aire para los distintos contaminantes, recogidos en ANEXO I del Real Decreto 1027/2010, de 28 de enero, relativo a la mejora de la calidad del aire.

En la tabla se podrá visualizar la media de las mediciones realizadas durante el periodo mencionado así como el máximo horario de dichas mediciones, los contaminantes recogidos en este apartado son:

- Fracción PM10 de material particulado
- Fracción PM2,5 de material particulado
- Ozono
- Dióxido de nitrógeno
- Monóxido de carbono

Parámetro	VIA	VLP	ACPM 01		Observaciones	
			Max.	Media		
PM10	45	50	N/A	89,65	Se ha superado el nivel de máxima horaria (valor superior al 50), 14 de los 365 días mensuales superó el 50, por lo que se considerará como incumplida la superación de la Unión.	
PM2,5	25	N/A	N/A	42,33	24,67	Se ha superado el nivel de máxima horaria (valor superior al 25), 6 de los 365 días mensuales superó el 25, por lo que se considerará como incumplida la superación de la Unión.

Parámetro	VIA	VLP	ACPM 01		Observaciones	
			Max.	Media		
NO2	40	N/A	200	26,29	34,60	Se ha superado el nivel de máxima horaria (valor superior al 40), 21 de los 365 días mensuales superó el 40, por lo que se considerará como incumplida la superación de la Unión.
O3	N/A	80	N/A	45,28	39,00	No existen superaciones.
NO	N/A	200	N/A	30,07	1,00	No existen superaciones de 50.
CO	N/A	1000	N/A	1000	200	Se ha detectado superación de parámetro CO, ha tenido lugar el día 16/04/2023.

2.2. Niveles de superaciones de Ruido según Real Decreto 1587/2007

ACQN1
Real Decreto 1587/2007, de 19 de octubre, por el que se desarrolla la Ley 37/2003, de 17 de noviembre, del Ruido, en lo referente a zonificación acústica, objetivos de calidad y emisiones acústicas. La prohibición de datos registrada entre los días 7 y 15 de enero ha afectado a los datos recogidos por el sistema.

Se ha superado de promedio mensual el nivel máximo de ruido (65 dB) de 7:00 a 18:59:
- Media mensual: 61,64 db
- Máximo mensual: 76,30 db
- Nº de superaciones horarias del nivel de alerta: 2



Se ha superado de promedio mensual el nivel máximo de ruido (65 dB) de 19:00 a 22:59:
- Media mensual: 61,58 db
- Máximo mensual: 76,30 db
- Nº de superaciones horarias del nivel de alerta: 2



El día 16 de enero se rebasó ampliamente la limitación siendo este junto al 17 de enero los días más ruidosos en esta ubicación en los periodos "día" y "noche".

Device behavior and operation

- Operating time
- Maximum and minimum operating periods
- Amount of data collected



Directive 2008/50/EC
of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe



Directive 2002/49/EC
of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise

INSIGHTS

Accuracy



Data



Suitability

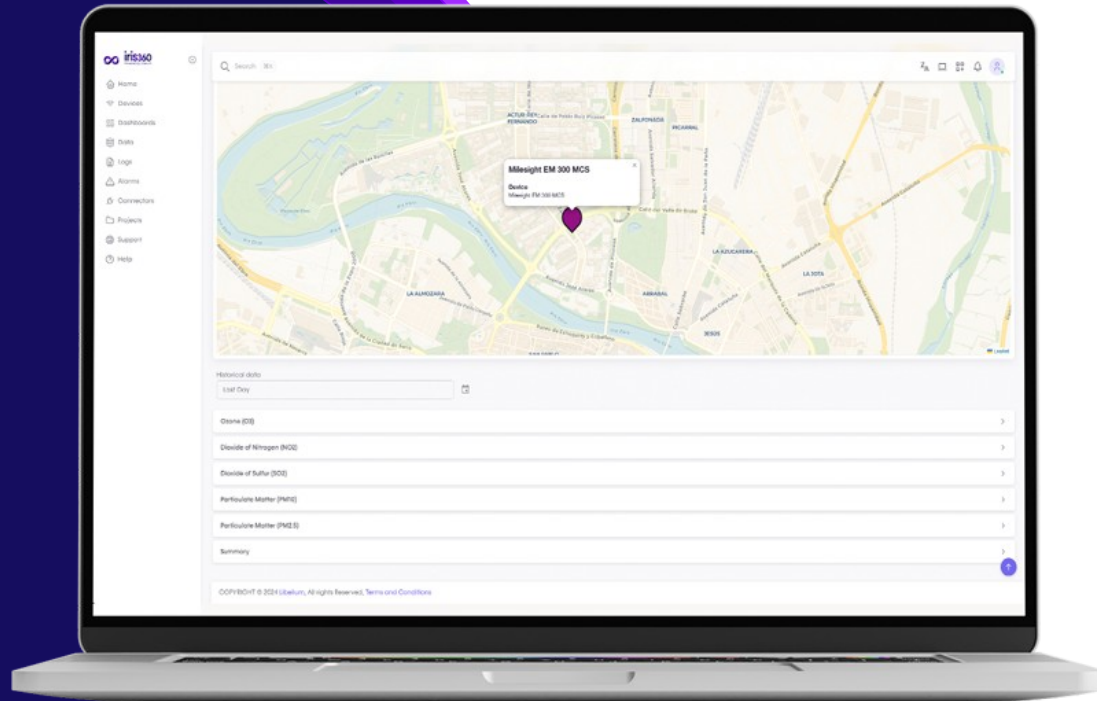


Vertical-Driven

IA

INSIGHTS



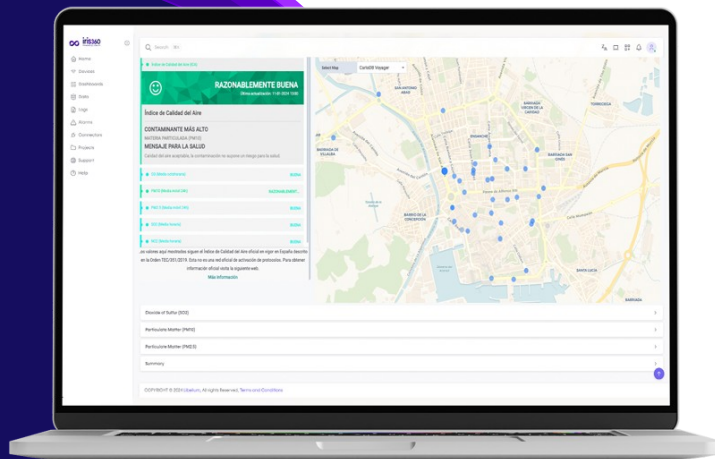


Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia

Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia



Location

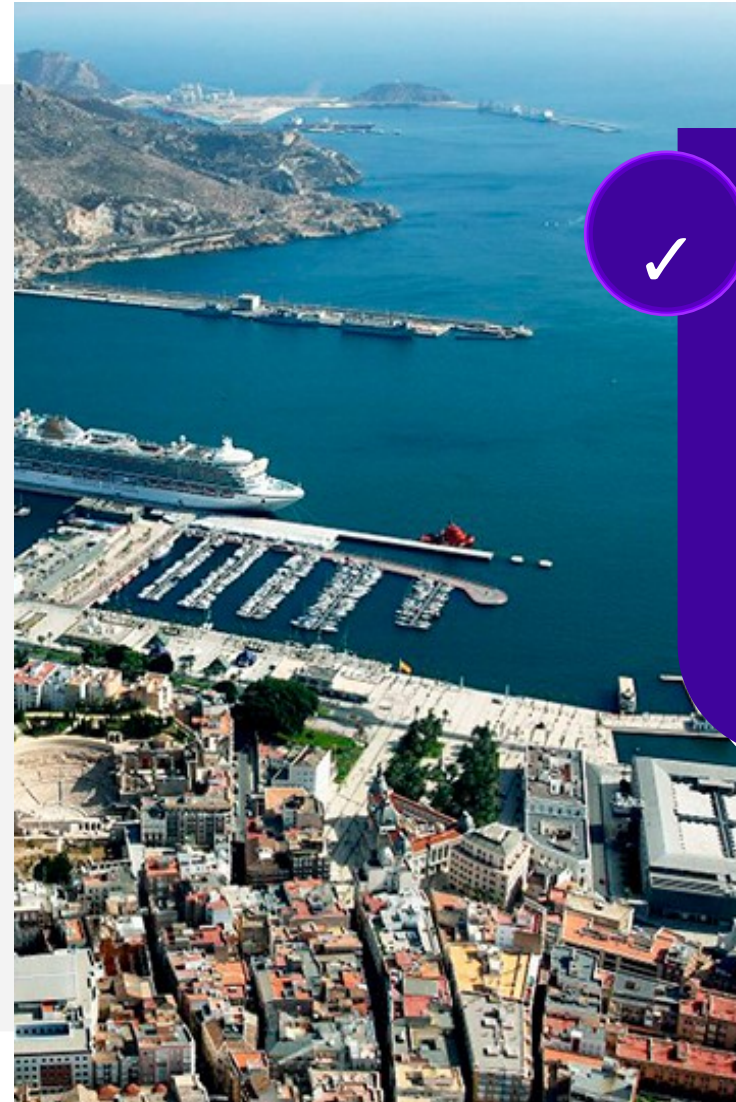
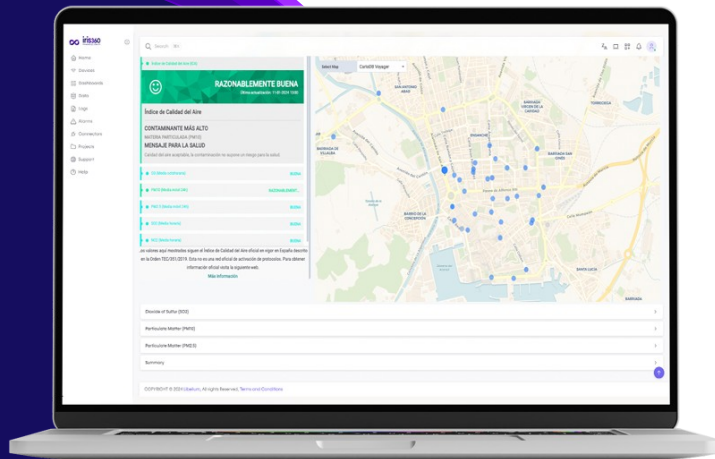
- Cartagena City (SPAIN)
- Bus Train Station (CETENMA - CARTAGENA - SPAIN)

The Challenge

- Air quality and noise monitoring, PM, and meteorological stations.
- Better irrigation control in parks and gardens
- Monitoring and control of people flow in local fairs
- Create a smart city platform: CEF Broker FIWARE

Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia



The result

- Creation of an integrated Smart City solution in different domains.
- Opening of new business opportunities for the City Council thanks to the generation of reliable KPIs.
- Digitalization of processes and improvement of decision-making based on real data.

Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia

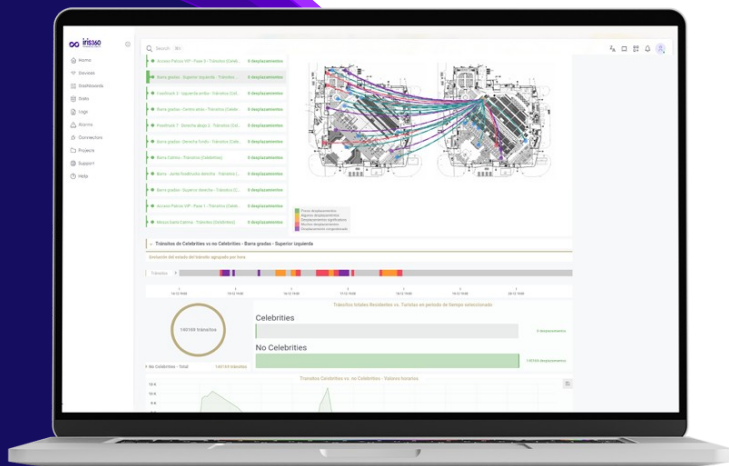


Location

- Medellín City (Colombia)

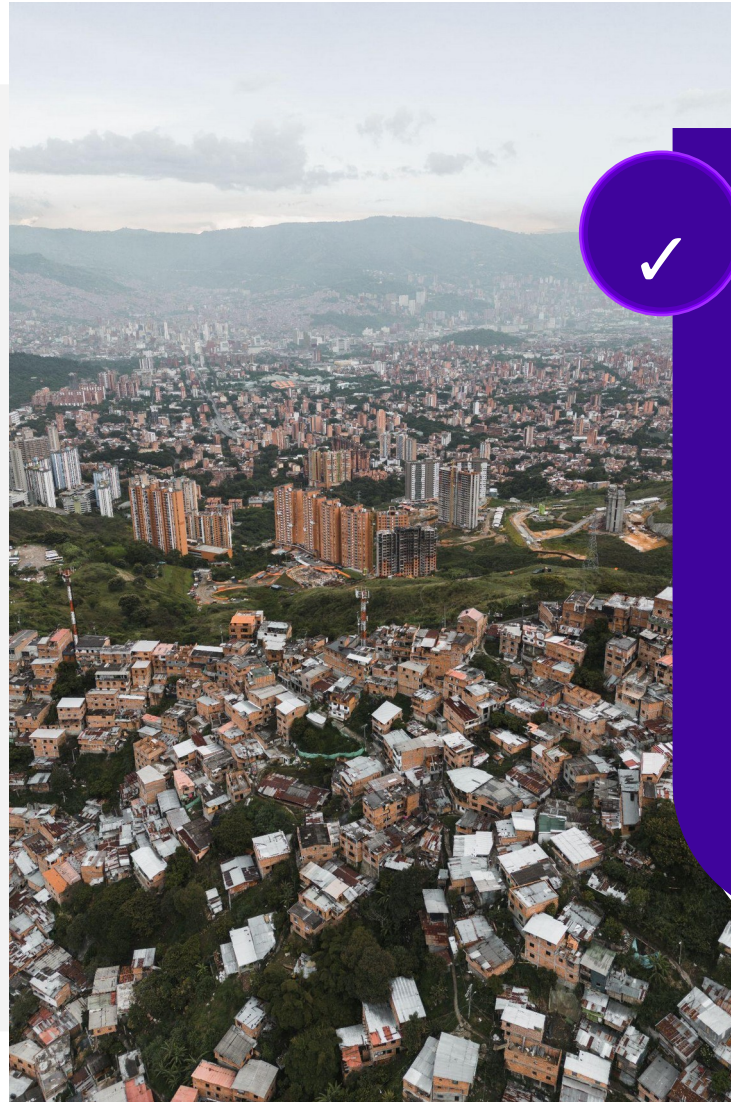
The Challenge

- Enable the integration of information from different devices and external sources for subsequent analysis and visualization.
- Ensuring interoperability between components (IoT).
- Smart city platform that is easily adaptable and replicable to other areas: environment, mobility, health, and security, among others.



Proven Technology

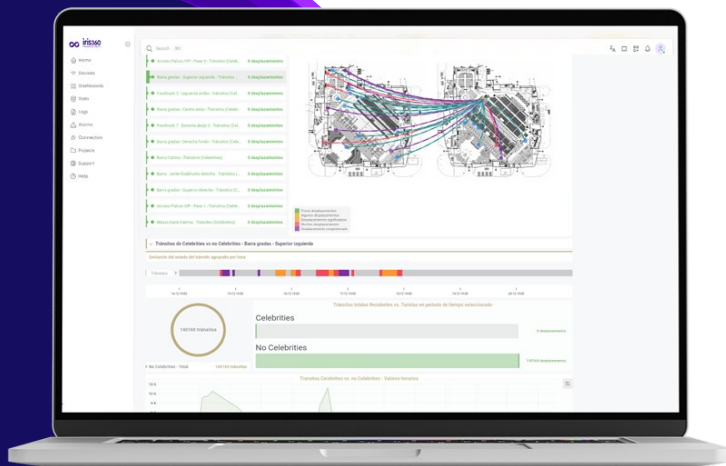
- Cartagena
- Medellín
- Algeciras
- Valencia



The result

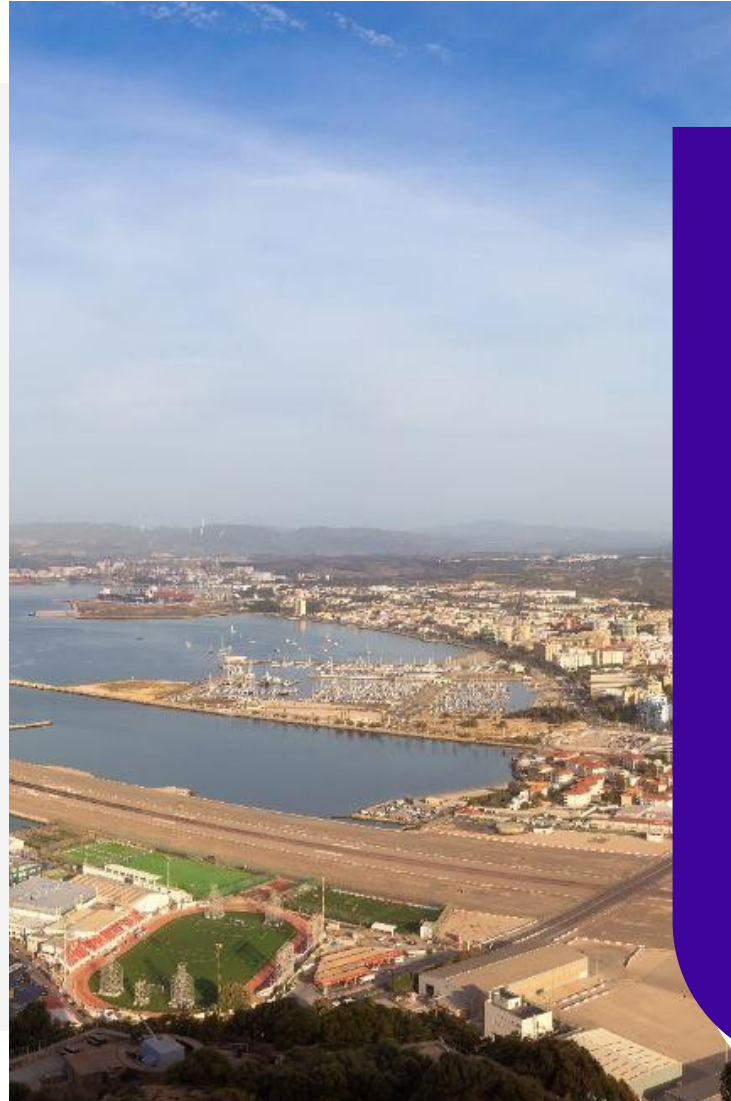
Development of a Smart City platform for the city of Medellín under an infrastructure that ensures data interoperability as well as data integrity, availability, and confidentiality.

- Provide real-time and historical data.
- Provide dashboards for real-time data visualization and historical reporting.
- Include big data tools that allow the analysis of information to support decision-making.



Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia



Location

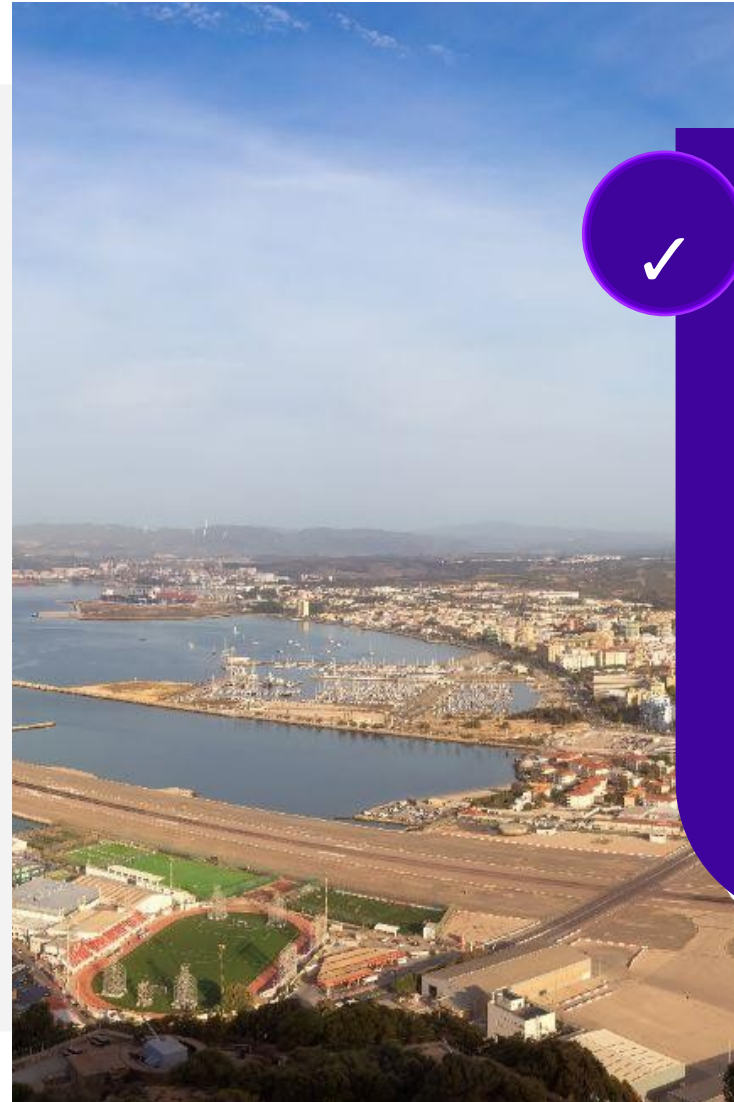
- Algeciras Port (SPAIN)

The Challenge

- Deployment of own sensors and sensors already installed by the Port Authority and other administrations.
- Development of a platform based on Artificial Intelligence that generates an impact model of the different actions carried out in the Port of Algeciras and its environment, using deep learning techniques such as long and short-term memory networks (LSTM) based on recurrent neural networks (RNN).

Proven Technology

- Cartagena
- Medellín
- Algeciras
- Valencia

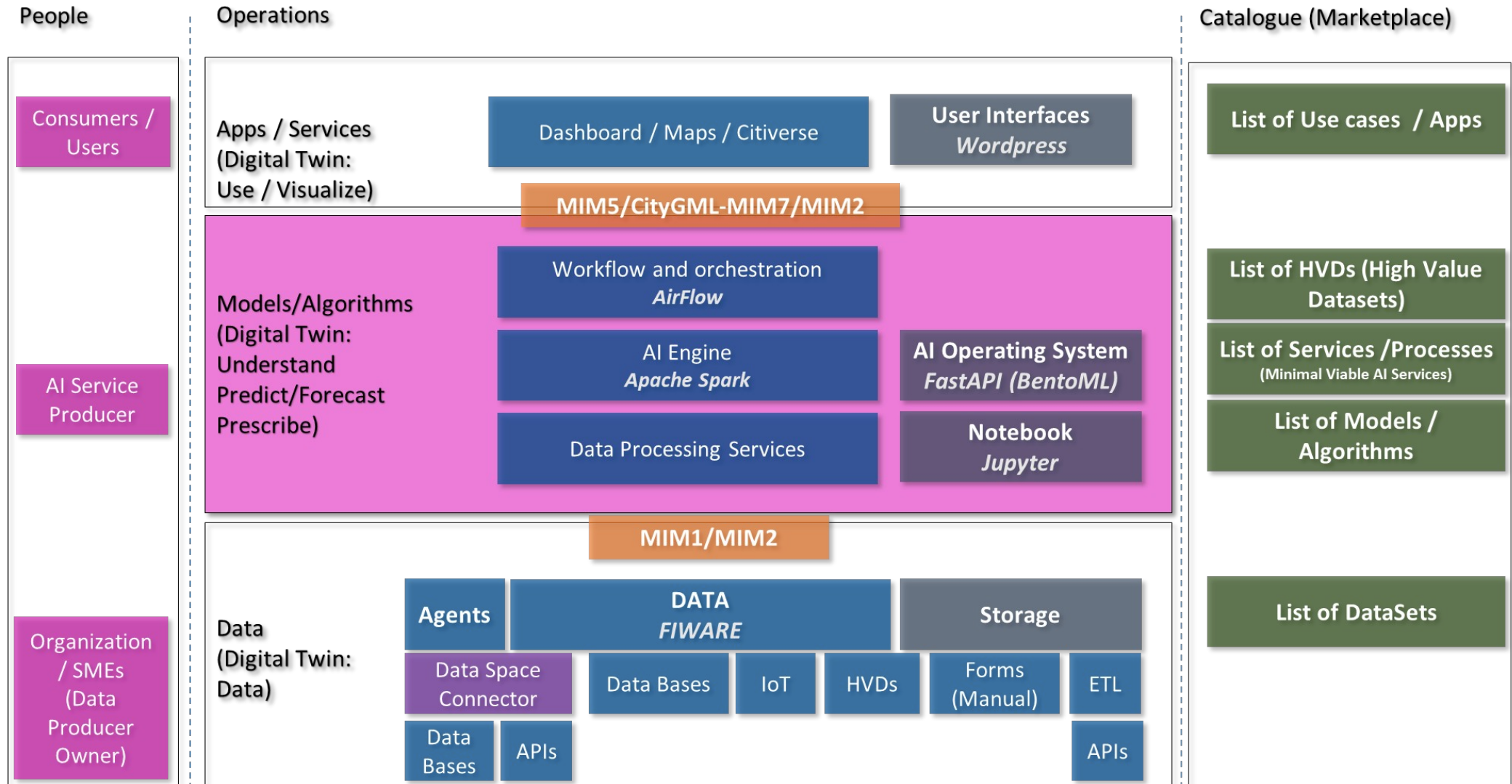


The result

Development of an advanced environmental and sustainability management platform that has allowed:

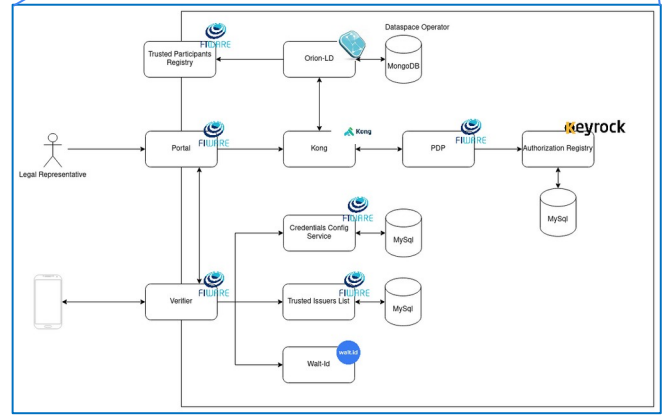
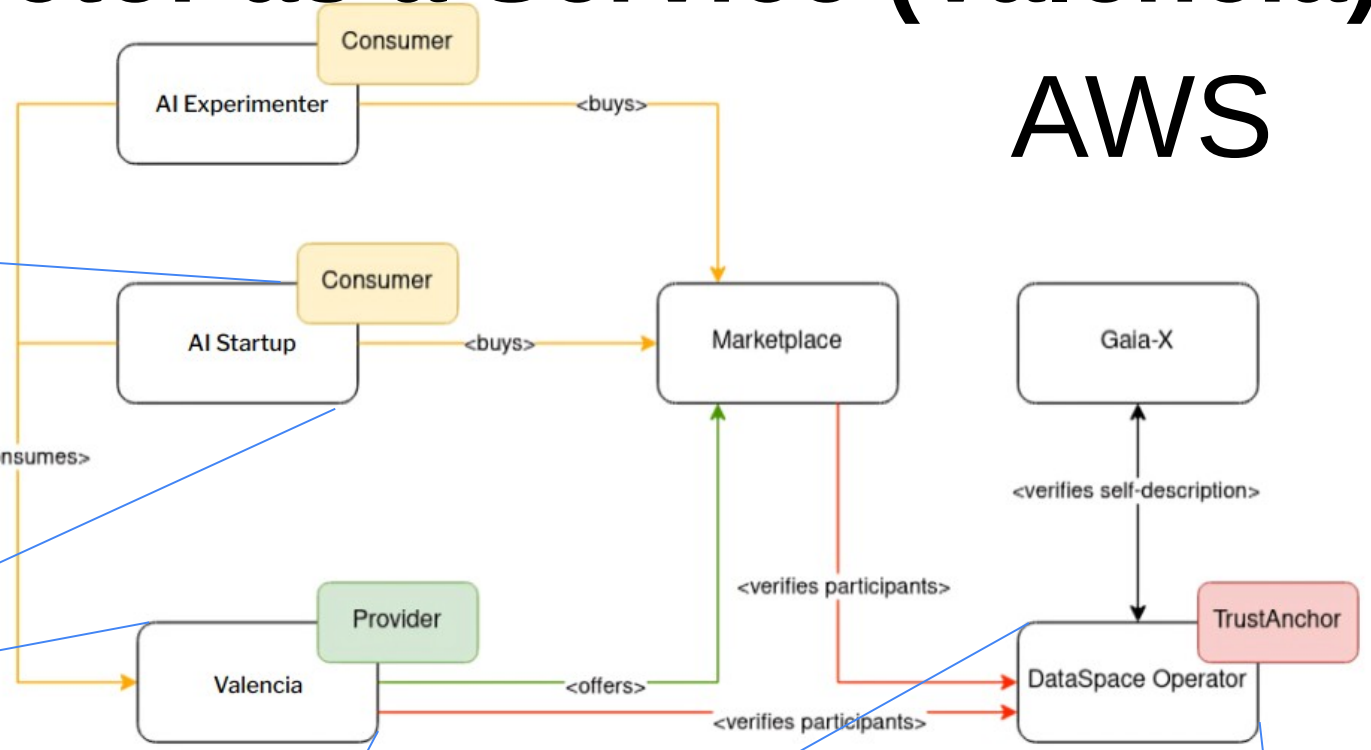
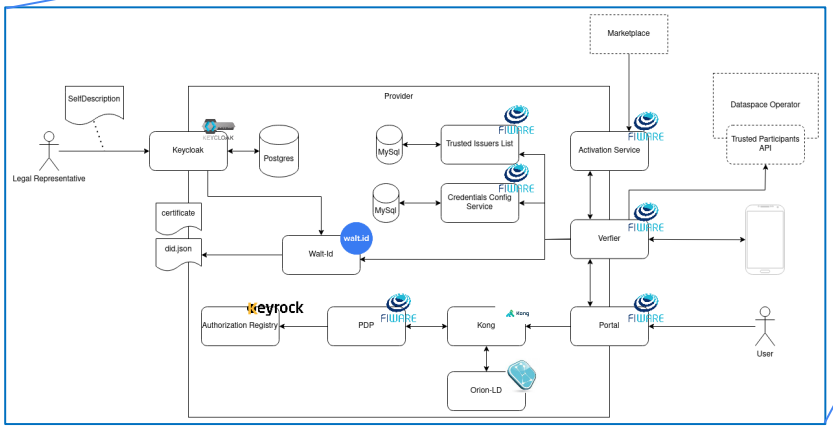
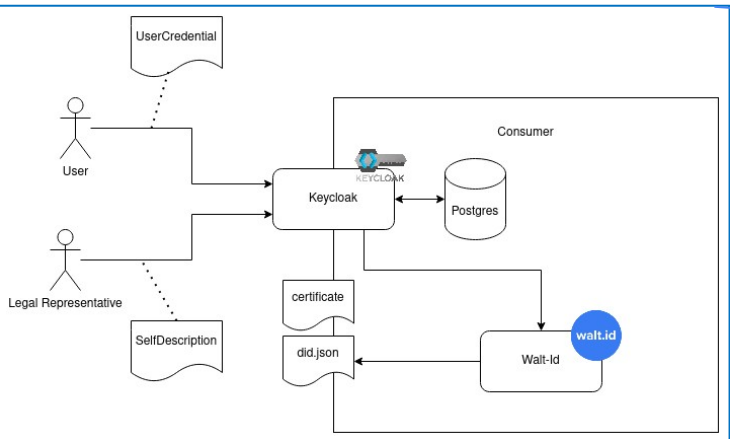
- Identify the different anomalies/events that have increased or reduced the impact of factors on the environment.
- Forecast medium-term impact and support strategies to promote sustainability; providing evidence, indicators, and models to support action plans.

Reference Architecture (Valencia Instance)



Data Space Connector as a Service (Valencia)

AWS



Data Space Connector as a Service (Valencia)

Gala-X
GXFS

gx:LegalParticipant

Id
did:web:pdc-demo.ds.smartcity-marketplace.com:did

Legal Name
Valencia

Headquarter Address
{ "gx:countrySubdivisionCode": "ES-VAL" }

Legal Address
{ "gx:countrySubdivisionCode": "ES-VAL" }

Registration Number
{ "gx:vatID": "MYVATID" }

Terms and conditions
70c1d713215f95191a11d38fe2341faed27d19e083917bc8732ca4fea497

Privacy Wallet

urn:uuid:a626ba4c-023a-4c5d-bdcb-a402f80a1a3a

You have a Verifiable Credential. To display it, click on the "Details" button. To delete it, click on the "Delete" button.

Details Delete

https://compliance.dsba.fiware.dev/credentials/offers/c840da4b-c309-41a6-9e6c-958b24314b21

You have a Verifiable Credential. To display it, click on the "Details" button. To delete it, click on the "Delete" button.

Details Delete

urn:uuid:6307825a-9dfb-41cc-ab05-8abd0204135f

Trusted Participants

Id did:web:packetdelivery.dsba.fiware.dev:did

Id did:web:onboarding.dsba.fiware.dev:did

Id did:web:happypets.dsba.fiware.dev:did

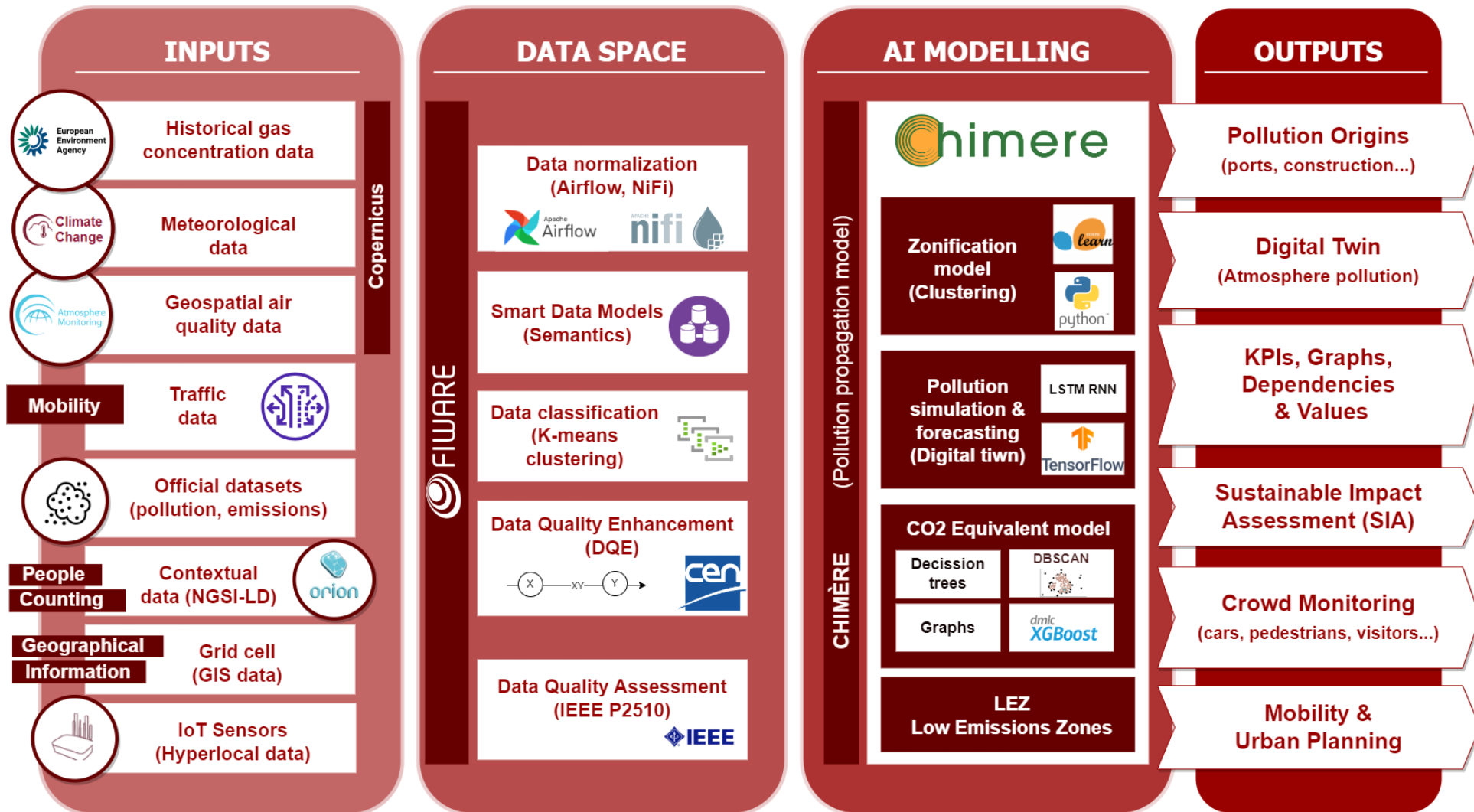
Id did:web:pdc-demo.ds.smartcity-marketplace.com:did

Id did:web:oasc.fr

Id did:web:ouranos-ws.com

Libelium solutions for Climate Impact assessment

Artificial Intelligence



Street Canyon

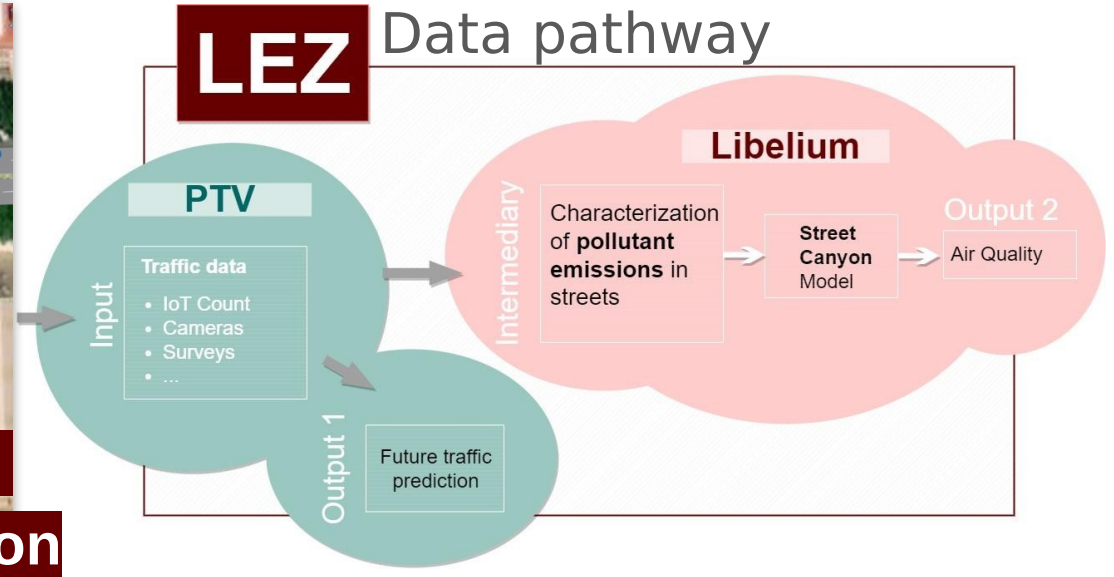
Mobility models

Data stages

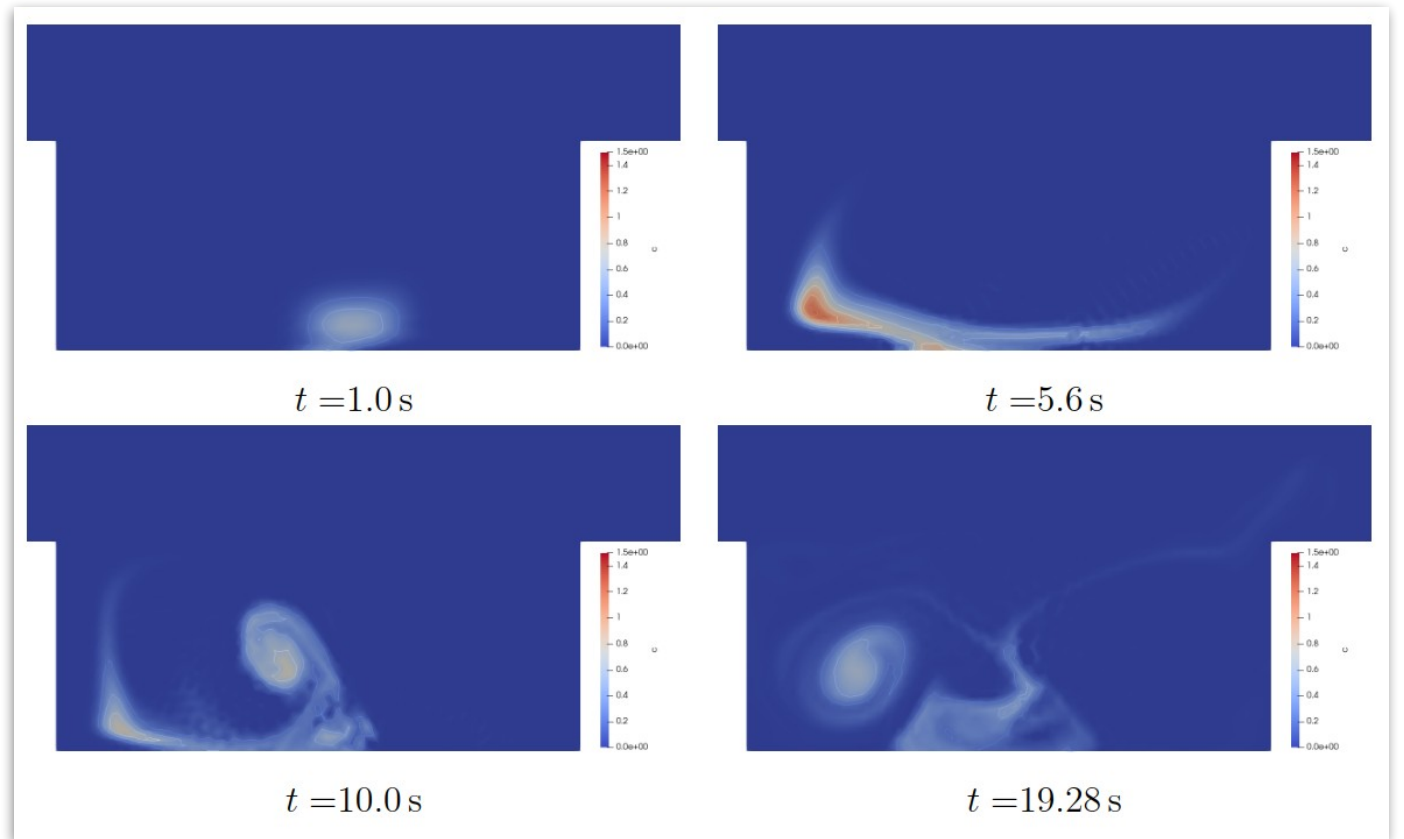
From traffic measurements to Air Quality modelling



LEZ Data pathway

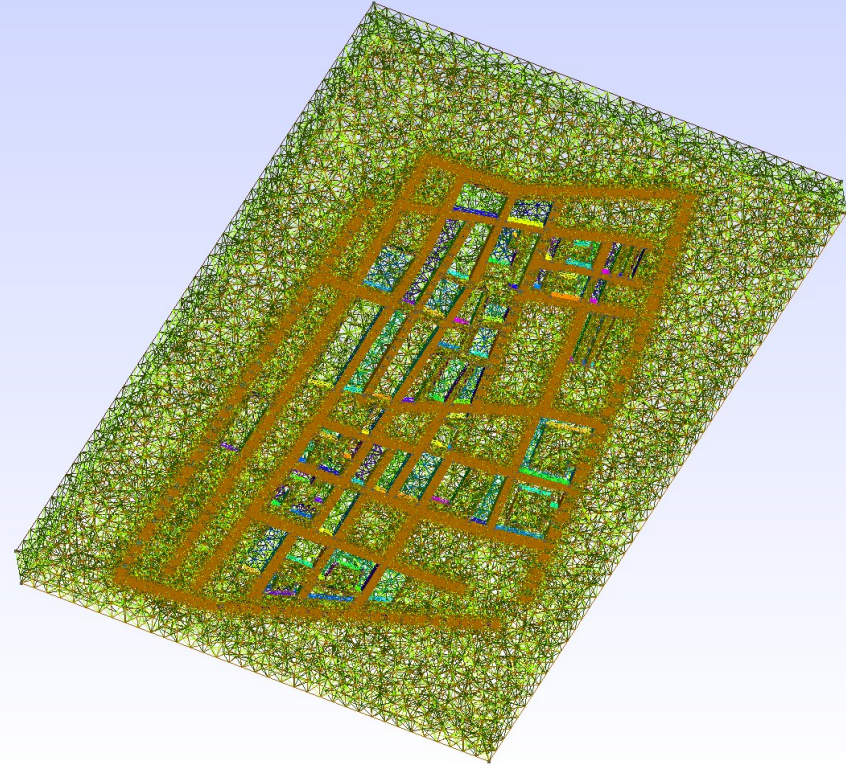
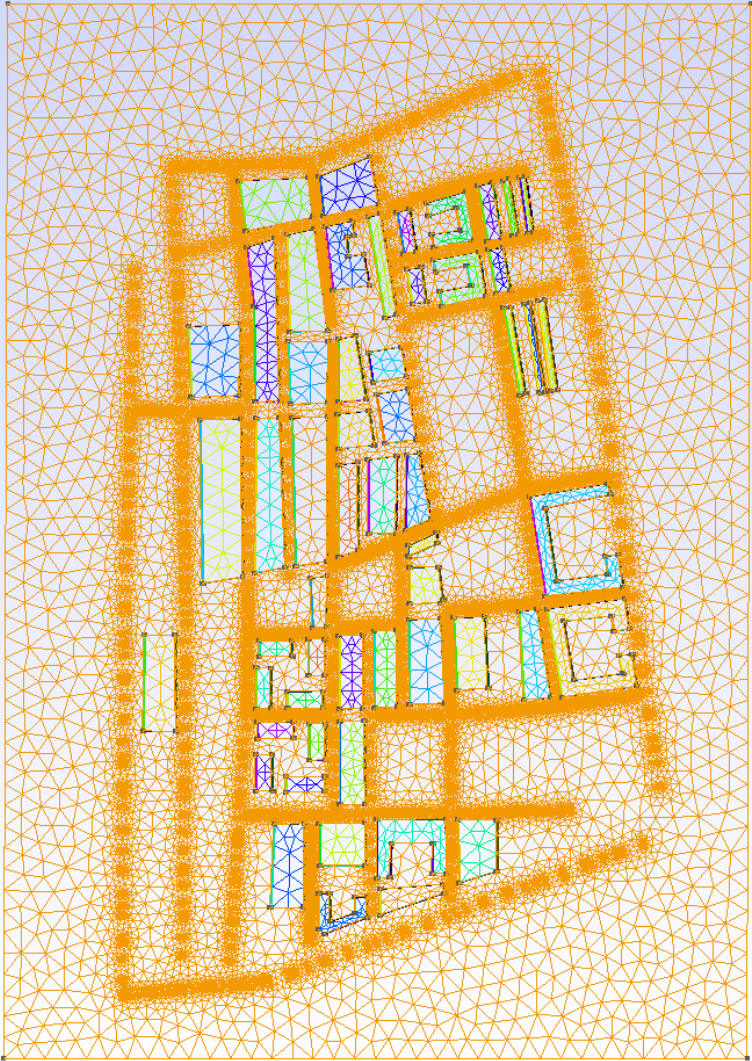


Street Canyon



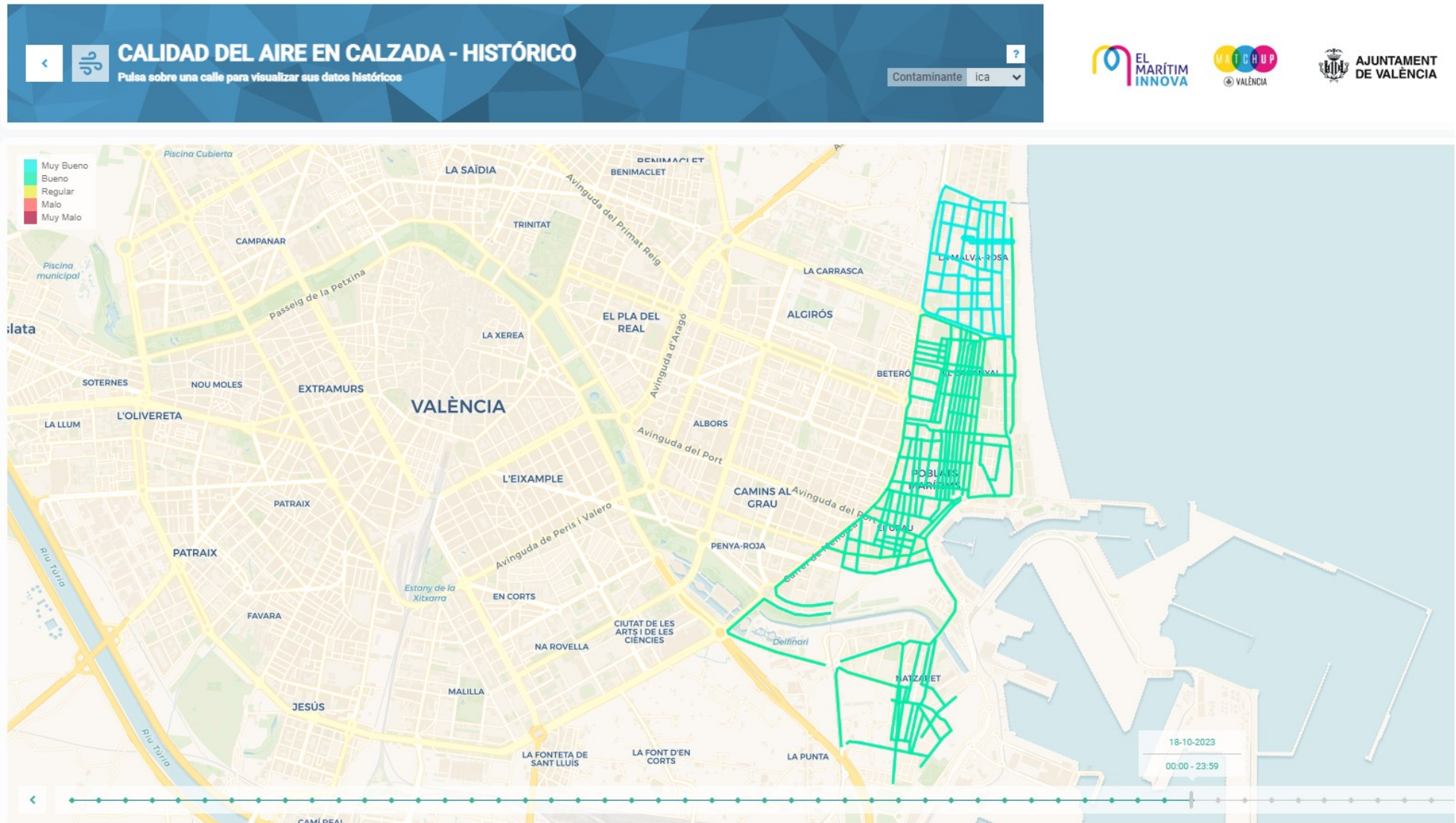
Transversal view of the streets: small scale behaviour of pollutants associated with the influence of building layout.

Street Canyon



Tridimensional simulation domain for Finite Element Method

Mobility pollution mapping



Mobility pollution mapping



Behind the change. Beyond the challenge.

Libelium

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