



New Emergency Management in a Resilience Era Facing Health, Climate and Energy Challenges

6th to 10th December 2021

Thursday 9th December 2021

Session 13 - PLATFORM
ARCHITECTURE FOR IMPETUS

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New Emergency Management in a Resilience Era Facing Health, Climate and Energy Challenges



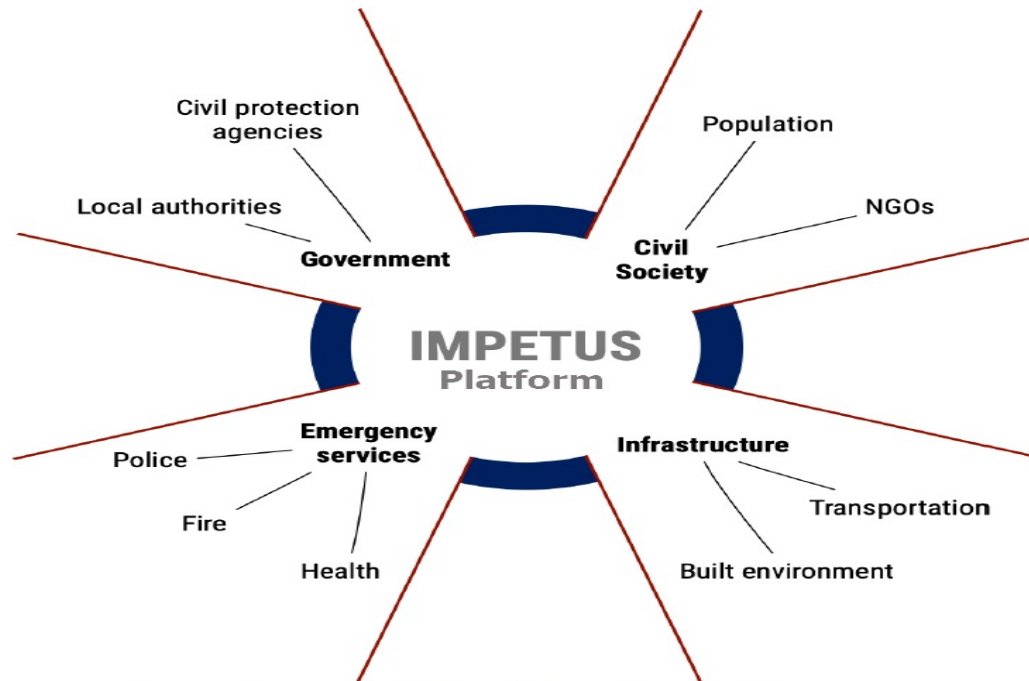
IMPETUS project receives funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 883286.

www.impetus-project.eu

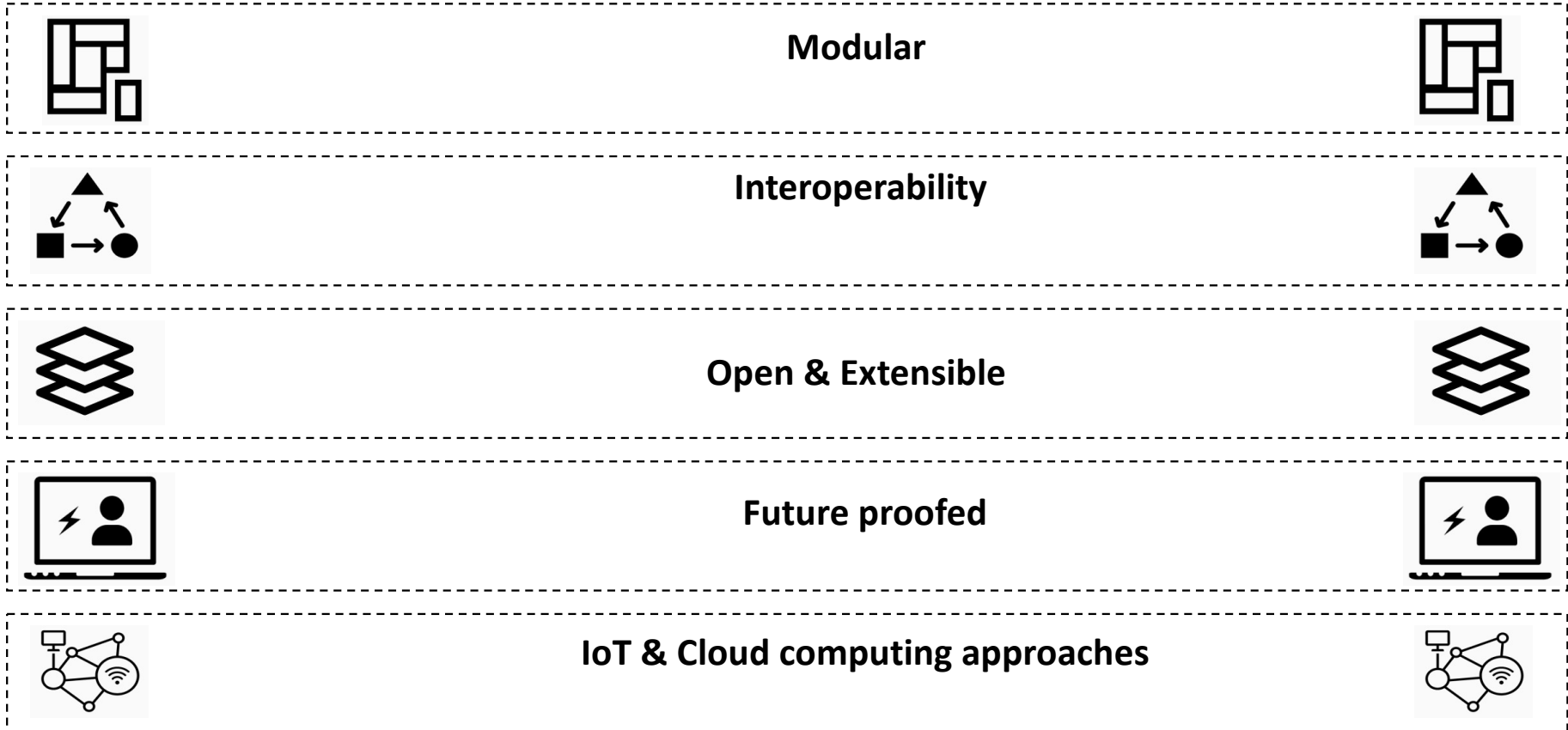
RESEARCH	INDUSTRY & SMEs	NGOs	CITIES
SINTEF Institut Mines-Télécom UNIMES UNIVERSITÀ DEGLI STUDI DI PADOVA eni consiglio interuniversitario nazionale per l'informatica	SIMAVI Software Imagination & Vision THALES CINEDIT INTELLIGENT VIDEO ANALYTICS SIXGILL INSIKT INTELLIGENCE XM CYBER UniSMART Fondazione Università di Padova	Entrepreneurship Development Centre for BIOTECHNOLOGY and MEDICINE ISP S-T-I-M-E	 Oslo

The Platform – Objectives

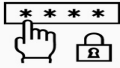
- Collecting and sharing information between security and emergency actors
 - Detect threats
 - Classify & monitor
 - Optimize response



The Platform – Characteristics



The Platform – Capabilities



Access Control



Alerting



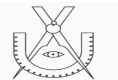
Internal Integration



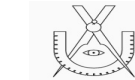
Security



External Integration



UI/UX



The Platform – Access Control



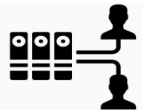
Access rights based on roles

- Within the platform users have associated roles, which allow access to certain features



Access control policies

- Who can access information, where and when



Simultaneous users connected

- The platform allows the connection of simultaneous users.



The Platform – Access Control



Single-Sign On



LDAP and Active Directory



Standard Protocols



Centralized Management of users



The Platform – Alerting



Alert centralisation

- The platform centralises the alerts produced by the integrated tools



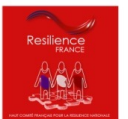
Alerts displayed

- The platform displays the alerts in dashboards



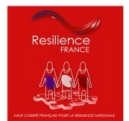
Alerts priority

- The alerts have different level of attention



The Platform – Alerting

- Notifications/ alerts in the form of a list will be displayed in a ‘main central’ dashboard.
- Alert messages will contain concise information: “Alert code” & “Alert summary” & “Alert date”.



The Platform – Technical alerts vs. Operational alerts

For certain tools, the alerts will be divided into two categories:

- ✓ Technical alerts
- ✓ Operational alerts

As an example, alerts for Human Computer Interaction will be:



-technical: e.g. Sensor disconnected



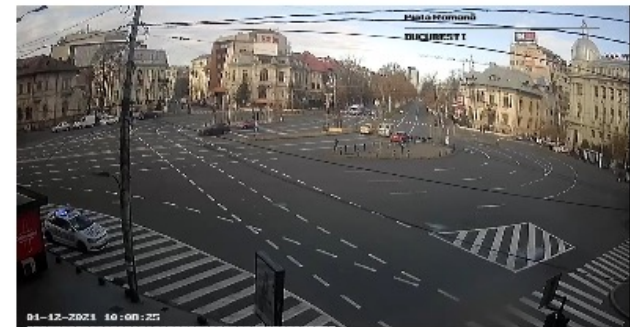
- operational: e.g. High level of stress



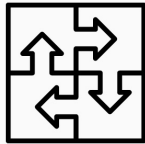
The Platform – Alerting

In the dashboard there are links that will be used to:

- tool access
- opening various applications
- opening documents (manuals, tutorials, etc.)

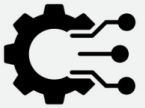


The Platform – Internal Integration



Tools integrated

- The platform is modular, individual tools can be added or removed without disturbing the functionality of the platform



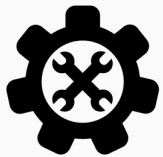
Data integration

- Tool output is centralised at platform level



Data enrichment

- Outputs of the tools are combined in order to derive new information or to raise the alert confidence level



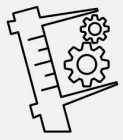
Standardised communication

- Data of the tools will respect platform defined format in order to ensure interoperability



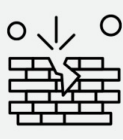
The Platform – Security

- **IMPETUS platform should be intended to always be in operation.**
- **IMPETUS platform must be protected from outside intruders.**



Best practices

- Up to date software
- User training and security awareness
- Data protection in transit and in storage



Vulnerability assessment



GDPR compliance



The Platform – External Integration



Sharing of information

- Sharing of information to users from organisations which are not part of the IMPETUS operating environment.



Alerts for different operators

- IMPETUS platform provide alerts for different operators across different organisations.



Interaction with existing devices and platforms

- The IMPETUS platform interacts with existing devices and platforms in the cities.

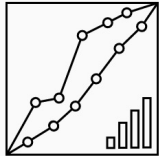


The Platform – UI/ UX



Multiple languages

- The IMPETUS platform will be available in multiple languages.



Aggregated data and diagrams

- The IMPETUS platform will provide aggregated data and diagrams to allow for strategic monitoring and planning.



Common terminology

- The IMPETUS platform will adapt a common terminology and symbology.

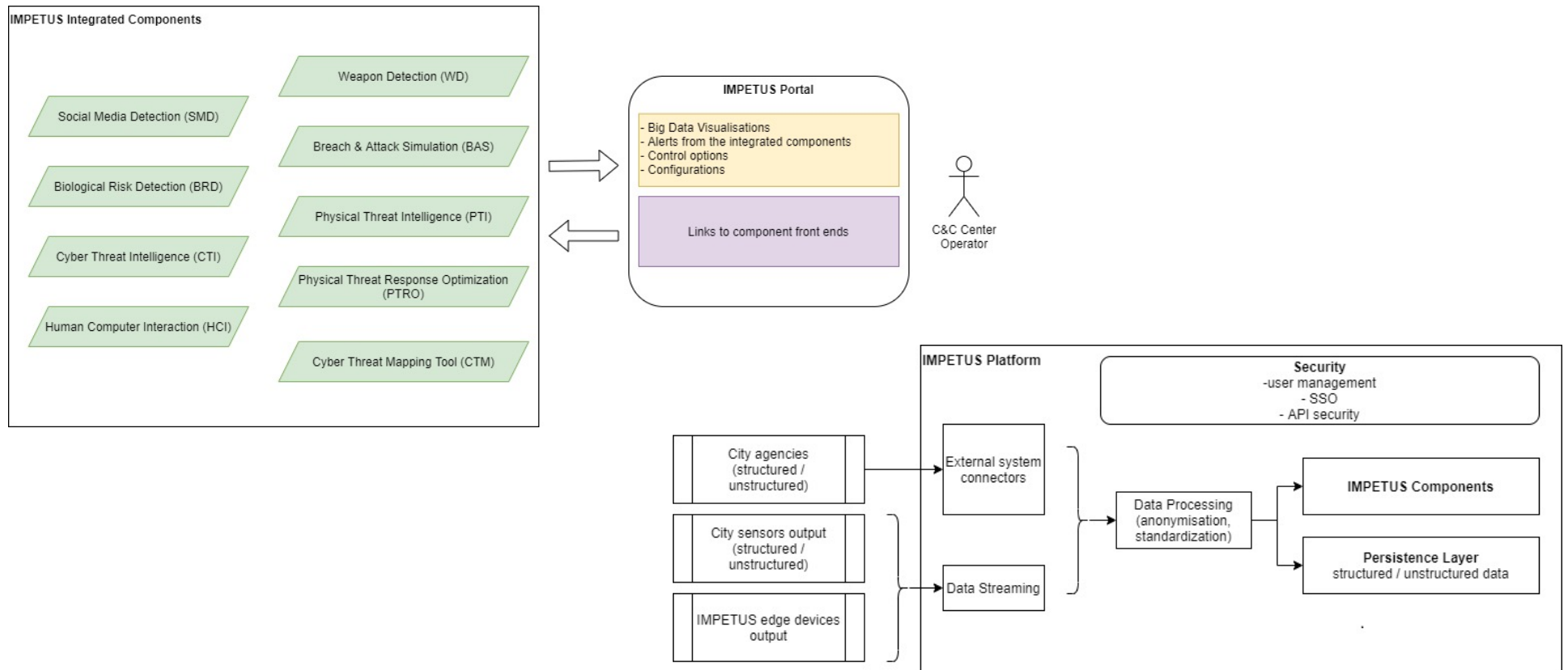


Different forms of interaction

- The platform supports different forms of interaction depending on the situation and user profile



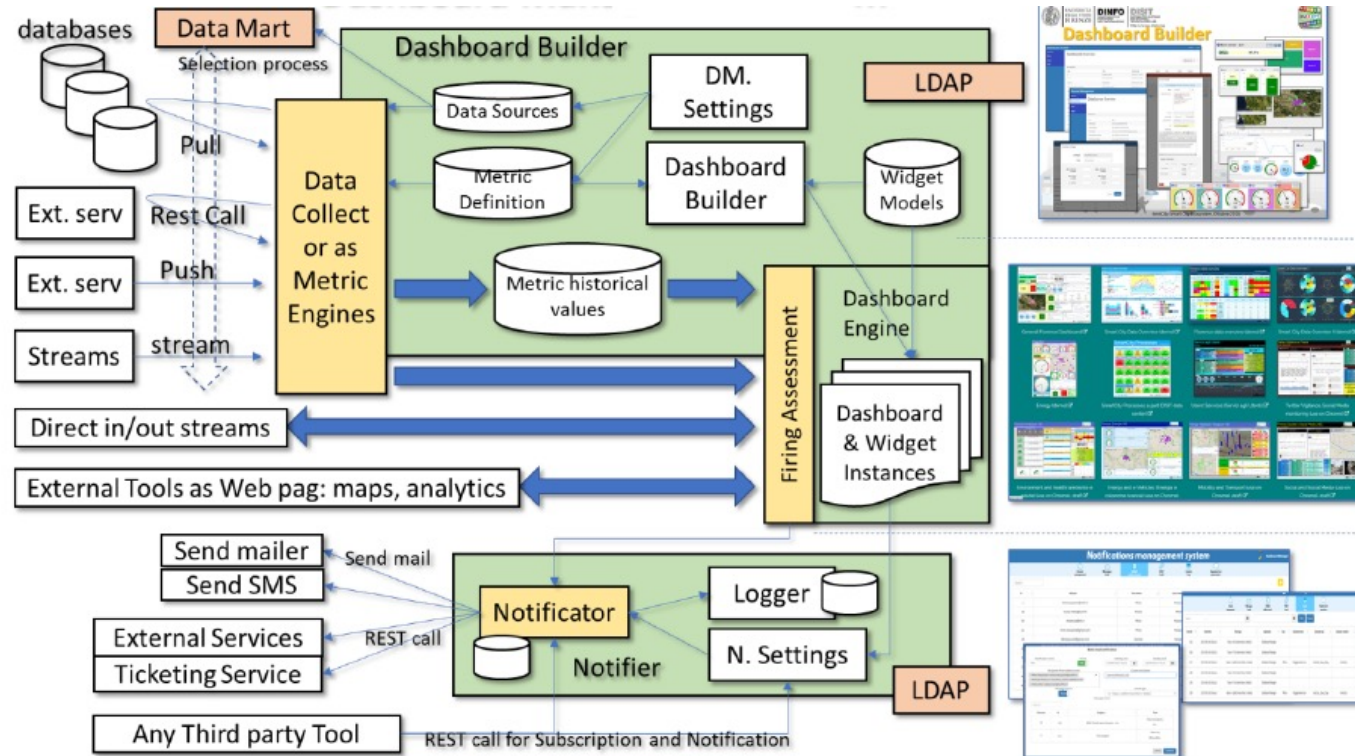
The Platform – Architecture



The Platform – Snap4City Dashboard Management System

Snap4City: Smart aNalytic APp builder for sentient Cities and IOT www.snap4city.org

The general architecture

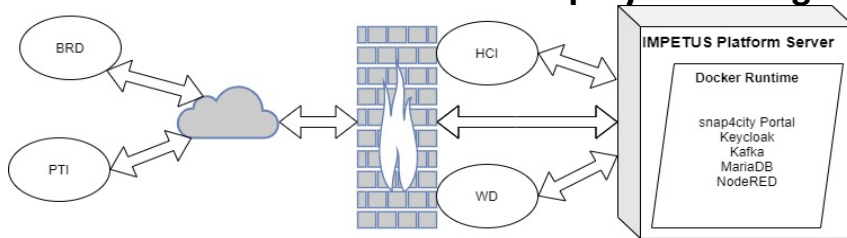


The Platform – Platform v1 release

➤ Platform infrastructure: Hosting

The IMPETUS platform is hosted on a project server available at impetus.simavi.ro. For the first release of the platform, the tools are hosted by the owner partner and are integrated via messages published to the project Kafka instance

➤ Platform infrastructure: The deployment diagram



➤ Integration with city solution

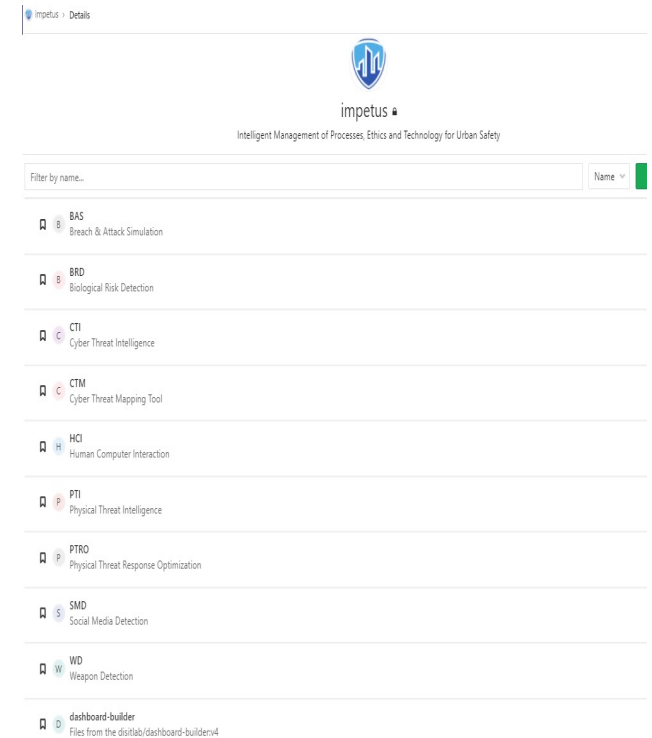
For the first iteration of the platform there is no integration with city solutions at the platform level. Planned integrations for the next iteration: Access CCTV cameras from the dashboards & Collect sensor data in a buffer databases that will be the source

➤ Different forms of integration

The platform acts as a middleware responsible for the integration of tools involved in the IMPETUS project

➤ Continuous integration

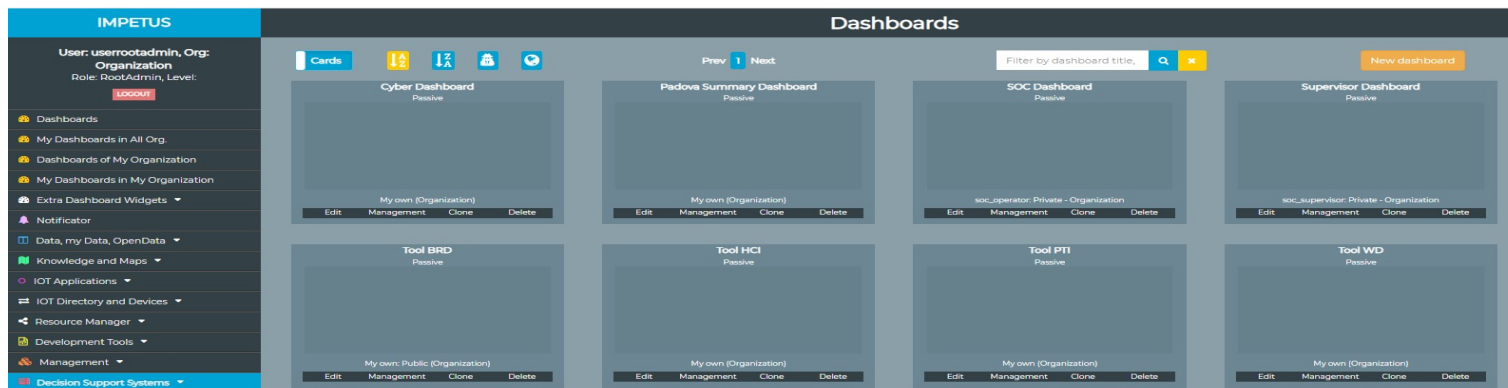
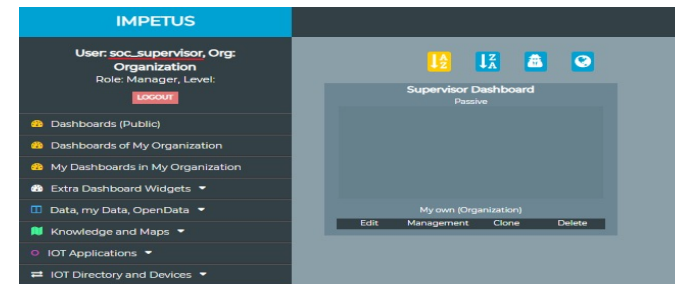
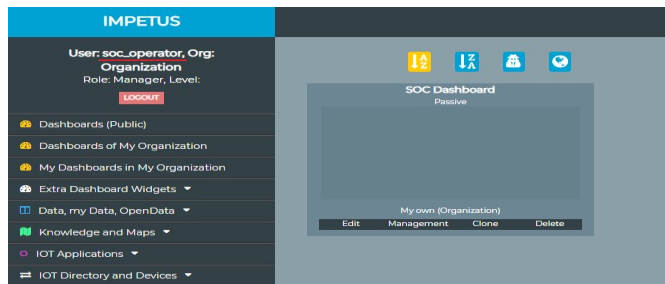
The IMPETUS project uses a GitLab instance



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The Platform – Dashboards

- Every tool integrated will have an entry page in dashboard
- Different dashboards adapted for different categories of users

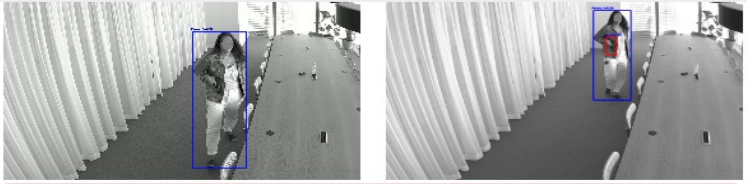


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The Platform – Dashboard example

SOC Dashboard

Weapon Detection PADOVA



IS THIS AN EMERGENCY?


YES UNDO **NO**

Go to WD App

SHOW LOCATION ON MAP

SHOW LIVE CAM

Live Cam



BRD Padova

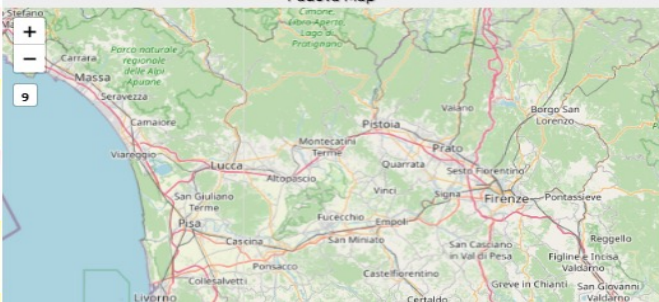
Location:
Timestamp: 04/12/2021 12:13:22

Bacteria level in air: 1
Water level: -45788
Bleach level: -19770
Dendriding level: 10
Standard level: 10
Drain level: 134194

PTI Padova

PTI ANALYSES RESULTS 04/11/2021 00:00:00
CRITICAL 04/11/2021 00:00:00
MINOR 04/11/2021 00:00:00
CRITICAL 04/11/2021 00:00:00
MINOR 04/11/2021 00:00:00
MINOR 04/11/2021 00:00:00

Padova Map





The Platform – Dashboard Widgets

Dashboard

➤ Widgets can be add into Dashboard

The screenshot shows a dashboard configuration window titled "Add new widget to dashboard". The window is divided into several sections:

- Metric and widget choice:** This section contains several form fields:
 - Widget category:** A dropdown menu with "Data viewer" selected.
 - Metrics category:** A dropdown menu with "Personal metrics" selected.
 - Metric:** A dropdown menu.
 - Metric description:** A text input field.
 - Widget type:** A dropdown menu.
 - Widget link:** A text input field with "none" entered.
- Generic widget properties:** This section contains various configuration options:
 - Title:** A text input field.
 - Background color:** A color picker with "rgba(2" entered.
 - Content font size:** A text input field.
 - Content font color:** A color picker with "rgba(C" entered.
 - Header color:** A color picker with "rgba(2" entered.
 - Header text color:** A color picker with "rgba(C" entered.
 - Period:** A dropdown menu with "No" selected.
 - Refresh rate (s):** A text input field.
 - Height:** A dropdown menu.
 - Width:** A dropdown menu.
 - U/M:** A text input field.
 - U/M position:** A dropdown menu with "Next to v" selected.
 - Show header:** A dropdown menu with "Yes" selected.
 - Font type (autosuggestion):** A text input field with "Auto" entered.
- Specific widget properties:** A large empty text input field.

At the bottom right of the configuration window, there are two buttons: "Cancel" and "Confirm".



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The Platform – Weapon Detection multiple cameras

➤ Multiple cameras can be associated for WD alerts:

The screenshot displays a user interface for a weapon detection system. On the left, a video feed from 'Cinedit' shows a person walking in a hallway, with a blue bounding box around them. Below the video is a pink box asking 'IS THIS AN EMERGENCY?' with 'YES' (red), 'UNDO' (grey), and 'NO' (green) buttons. To the right of the video are four buttons: 'Go to WD App', 'SHOW LOCATION ON MAP', 'SHOW LIVE CAM1', and 'SHOW LIVE CAM2'. On the right side of the interface, there are two live camera feeds. 'Live Cam 1' shows a street intersection in Bucharest with text overlays 'Piața Romană', 'BUCUREȘTI', and 'Luni-Vineri 10-18'. 'Live Cam 2' shows a public square in Suceava with text overlays '01/12/2021 10:22:10', 'Suceava Centrul', and 'Hala Cambomania'.



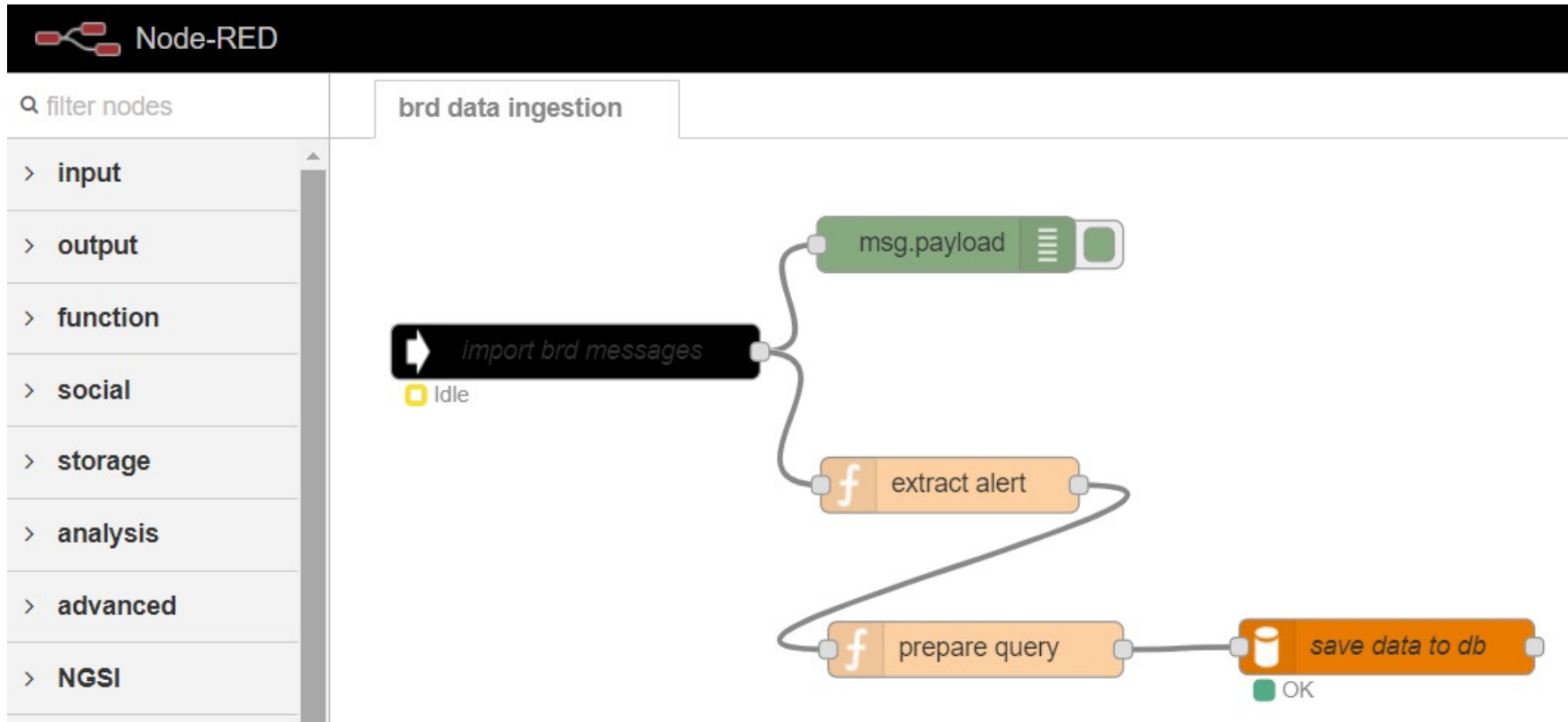
The Platform – Human Computer Interaction: Consoles

➤ The individual status for each console can be tracked



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The Platform – Data ingestion example



The Platform – Acceptance Pilot feedback

- ✓ Live cam implemented **in the platform** (not on tools). A standard must be found so that in the future it does not necessarily depend on the live cam software used in each city.
- ✓ For the WD tool **send screenshots**/photos from the platform. These photos can be locally saved or can be sent to third parties, a list of addresses.
- ✓ For alerts, there must be a **checklist** to check/ follow. They must follow a working procedure.
- ✓ When accessing an alert (alert summary) it should display **more details** based on which a decision will be made.
- ✓ **Reports** implementation: generate and download all kinds of reports/ situations. For example, at the end of the day, for HCI, statistics on the degree of stress should be displayed on each console/ user.
- ✓ The platform must always be in the **center of attention** for the user. Therefore, when accessing certain tools from the platform, the tools should not be displayed in a new tab/ page but should be included in the platform (the platform should still be active so that the user does not lose contact with it).





Are there any questions?

