beAWARE
Enhancing decision support and management services in extreme weather climate events

Overall Project Presentation

The beAWARE team
General Information

• **Project Coordinator:** Centre for Research and Technology Hellas – Information Technologies Institute (CERTH-ITI), GR

• **Project Website:** [https://beaware-project.eu/](https://beaware-project.eu/)

• **Duration:** 1 January 2017 - 31 December 2019

• **Type of Action:** IA - Innovation action

• **Total Cost:** € 6 725 209

• **EU Contribution:** € 5 953 780

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 700475
The Challenge

- **Extreme weather and climate events**, interacting with exposed and vulnerable human and natural systems, can lead to disasters.

- Some types of extreme events (e.g. flash floods) have **increased**.

- **Enhance the response capacity** to extreme weather and climate events affecting the security of people and assets.

- **Current solutions** just **display** inputs to the authorities.

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beAWARE concept

- beAWARE proposes a holistic approach to the realization of crisis management frameworks supporting all the phases in an emergency sequence.

- beAWARE offers an integrated solution to provide early warnings, risk assessment, aggregated analysis of multimodal data and decision support to the authorities in order to plan and coordinate the most effective response with the available resources.

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Data products
- Weather Data
- Social Media
- Sensors
- Drones
- Mobile App

Integration
- Knowledge Base
- Database

Technologies
- PSAP
- Report Generation
- Mob. App
- Text Analysis
- Video Analysis
- Crisis Classification
- Audio Analysis
- Image Analysis
- Social Media Analysis

Stakeholders
- Citizens
- Authorities

PREVENTION
PREPAREDNESS
RESPONSE
beAWARE Pilots

- **Flood**: support decision makers in Vicenza during unplanned events (emergencies), in particular floods and flash floods.

- **Fire**: provide early warnings and support to the Valencia authorities before and during a fire. The fires can be influenced by the weather as periods of dry weather increases the risk of fires in the nature, and heavy winds can cause a wide spreading in a given direction.

- **Heatwave**: support the authorities during a strong heatwave (over 40°C) during summer in a region in northern Greece
Project Objectives

Obj.1 – Perform a research study on the requirements for emergency services given the current digital landscape

Obj.2 – Multilingual speech & written communication analysis

Obj.3 – Aggregate multimodal information

Obj.4 – Visual context analysis

Obj.5 – Semantic integration of multimodal information

Obj.6 – Multilingual report generation

Obj.7 – Main Public Safety Answering Point (PSAP)
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Requirements and Use Cases

- beAWARE end users (meetings, workshops)

- List of **User Requirements**
  - e.g. “Display information to authorities in a web-gis platform” - “Sending warnings of pre-emergency alerts to citizens by authorities”

- List of **Use Cases** for the beAWARE pilots
  - UC_101: Declaration of the attention status and continues monitoring of flood forecasting

- **Specific, Reusable, Transferable**

<table>
<thead>
<tr>
<th>Requirement name</th>
<th>Requirement description</th>
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<tbody>
<tr>
<td>Display information to authorities in a web-gis platform (citizen and first responders reports by calls, apps, social media)</td>
<td></td>
</tr>
<tr>
<td>Display reliable and trustful flood forecasts, potential dangerous situations and the forecasted level of risk to the authorities, based on the results of the EarlyWarning System AMICO (improved with the assimilation of Satellite data (snow cover, soil moisture, etc.) and Meteorological forecasts data with a finer spatial resolution provided by FMI)</td>
<td></td>
</tr>
<tr>
<td>Provide authorities/citizens with automatic warnings on river levels overtopping some predefined alert thresholds, based on monitoring data from various sources</td>
<td></td>
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Multilingual Text Analysis

- Analysis from English, Greek, Italian and Spanish texts
  - Text from tweets
  - Text from mobile application (first responders/people in danger)
  - Text from automatic speech recognition output
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Aggregate Multimodal Information

- **Weather data**
  - Forecast & Current data

- **Sensor data**
  - Sensor-thing server
  - Hydrological and hydraulic modelling

- **Social media**
  - Collection of Tweets for Fire, Flood, Heatwave for English, Spanish, Greek and Italian

- **Multimedia**
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Visual Analysis

- Image, Video and Audio Analysis
  - Crisis event detection in images and videos
  - Traffic analysis from static surveillance cameras
  - Automatic speech recognition component

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Semantic Integration

- **Reasoning** based on multimodal input
- **Incidents to PSAP**
- **Clustering of** incidents
- Calculation of incidents’ **severity** levels
- Update of the **safe locations** status
- Identify the **crisis type**

Floated Via Carlo Scarpa

The Via Carlo Scarpa was flooded due to heavy rains. The powerhouse was suffered water damages and was shut down for safety reasons.
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Report Generation

- Any analysis output is an input to the Report Generation component
- Provide description/reports to the authority for an incident or for a cluster of incidents
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Main Public Safety Answering Point (PSAP)

- PSAP main environment
- PSAP dashboard
Technical Implementation Workflow

Requirements for the 1st prototype → Testing Plan → Meeting Backlog

- AAWA
- HRT
- PLV
- FBBR

Off Schedule ad-hock sessions

Weekly plenary meetings

beAWARE
Impact

• **Security of people**: beAWARE improves the way in which people interact with the authority

• **Emergency working routines**: the early warning, the DSS and the reasoning mechanism

• **Society**: new communication channels (social media)

• **First responders**: a larger number of emergencies can be detected more quickly and efficiently

• **Policies**: beAWARE contributes to the EU disaster management policies by proposing new strategies and technologies.

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In Field Demonstrations

- From Nov 2018, 3 field demonstrations will be carried out (one for each beAWARE prototype) with the participation of end users, decision makers and first responders

FLOOD
Vicenza, Italy
Q2 2019

HEATWAVE
Thessaloniki, Greece
by end of 2018

FIRE
Valencia, Spain
Q4 2019

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# Participating Organizations

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Personel</th>
<th>Country</th>
<th>Type of organisation</th>
<th>Field of Expertise</th>
<th>Involvment in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Protection- Municipality of Vicenza</td>
<td>15</td>
<td>Italy</td>
<td>Municipal</td>
<td>Civil Protection</td>
<td>PSAP Operator, Observer and Rescuer</td>
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<tr>
<td>National Assosiation of Alpini- Civil Protection Vicenza</td>
<td>6</td>
<td>Italy</td>
<td>Association</td>
<td>Civil Protection</td>
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<tr>
<td>AAWA personel</td>
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<td>Italy</td>
<td>Government</td>
<td>Public Authority</td>
<td>Citizen, PSAP operator, Decision Maker and</td>
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<td>Public Authority</td>
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</tr>
<tr>
<td>Land Reclamation Authority Veneta</td>
<td>3</td>
<td>Italy</td>
<td>Local Authority</td>
<td>Public Authority</td>
<td>Decision Maker and Rescuer</td>
</tr>
<tr>
<td>Local Water Authority- Vicenza</td>
<td>1</td>
<td>Italy</td>
<td>Provincial Authority</td>
<td>Public Authority</td>
<td>Decision Maker</td>
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</tbody>
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Images from the Pilot

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Photo Pilot

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the beAWARE consortium

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