# beAWARE

Latest Technical Developments

1. Implementation of First Prototype

The main goal of beAWARE platform is to provide support in all the phases of an emergency incident. In overall, is a learning platform which makes use of knowledge from previous incidents to support the authorities to respond better to security critical situations.

The Architecture of this platform is made up of the following layers: Ingestion layer, containing mechanisms and channels through which data is brought into the platform, Internal services layer, Business Layer and external facing layer, including the end-users' application and interfacing platform.

CERTH's development is focused on the business and the internal layer of the system. The first is containing the components that perform the actual platform capabilities while business layer is comprised by a set of middleware services responsible to extract semantic information, storing it, and inferring new based on accumulated data.
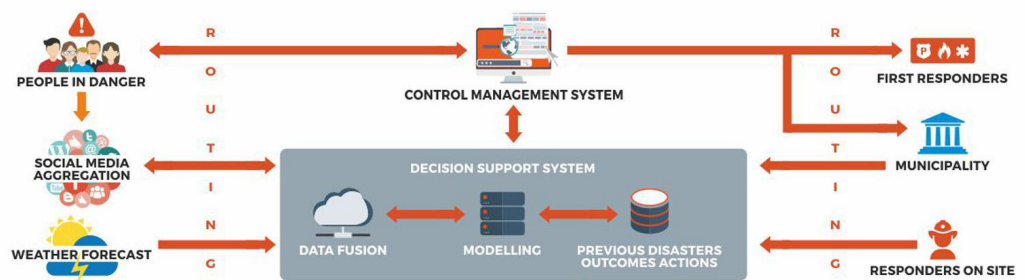
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Namely, the components developed by CERTH are the following:

• Concept and event detection from multimedia component, **which is responsible to localize and recognize crisis events in videos and images.**

• Automatic speech recognition component, which is employed to provide a channel for analysis of spoken language in audio and video files.

• Crisis classification, which consists of two components, one to provide crisis events forecasts and one for real-time monitoring of an ongoing event.

• **Social Media Monitoring** component, **which is responsible tocollect Twitter posts in multiple languages and classifiy the retrieved posts as relevant or irrelevant to the considered target even.**

• Semantic representation and reasoning module. **The aim of this module is to provide advanced decision support services to PSAP, by facilitating the derivation of high-level interpretations and knowledge from lower-level observations inserted into the Knowledge Base. Typical examples of derived knowledge will include: safe places in case of an emergency, evacuation routes, prioritization suggestions of rescue operations etc.**

In a typical flow, all ingested information is analyzed by system components and feed the reasoning module with the analysis results. The KB reasoner infers implicit knowledge concerning the crisis level and the current impacts and provides early warning and decision support generated by the Multilingual report generator that eventually is sent to the interface (PSAP).

2. Operational Prototype

After gathering the user requirements, the technical partners worked hard on implementing a first prototype. Before starting developing the applications, a software architecture was designed and decisions about the technical environment have been taken. It was worth the effort and the first operational prototype of the beAWARE platform is running.

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3. Mobile App

As part of the operational prototype, a first version of the mobile application is available for the enduser partners to test. The mobile app is the contact point for citizens as well as first responders to interact with beAWARE.

This includes sending reports about the ongoing situation including textual information, images, video and audio. It offers as well a communication channel from authorities to citizens by public alerts. Using the mechanisms the population can be informed and warned if a critical situation occurs.
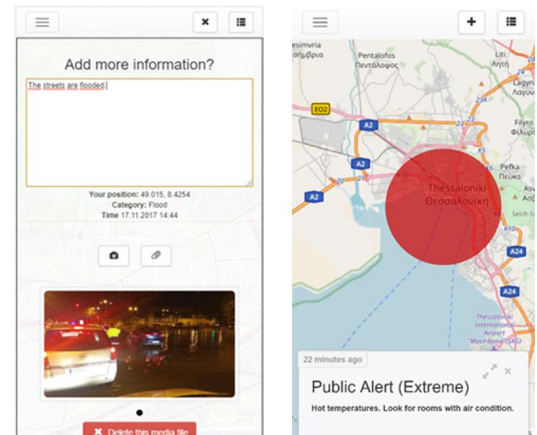
4. Tools

The knowledge base and ontology are deployed and filled with sample data. Now, we can query linked data and reason upon our stored knowledge. Our system can answer complex questions, which are defined in close collaboration with the project partners.

Possible questions of interest for the authorities then might be:

• Are there incidents with humans involved?(See Figure 1)
• How many objects and humans are involved in an incident? (See Figure 2)


```xml
<?xml version="1.0"?>
<sparql xmlns="http://www.w3.org/2005/sparql-results#">
    <head>
    </head>
    <boolean>true</boolean>
</sparql>
```

```
BASE    <http://beaware-project.eu/beAWARE/#>

ASK {
SELECT ?incident (COUNT(?human) AS ?humancount)
WHERE
{
?incident a <#Incident> .
OPTIONAL { ?human <#participantIsInvolvedIn> ?incident. }
}
GROUP BY ?incident
HAVING (?humancount >0)
```

Figure 1: SPARQL Query to find if humans are harmed during a crisis

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Figure 2: Humans and objects involved in the incident

The example in Figure 1 answers, if there are any incidents where humans are harmed. Upon this, the authorities could execute the query from Figure 1, which counts the number of involved humans and objects for all known incidents.

NEWS

The extreme weather events in Greece in 2017
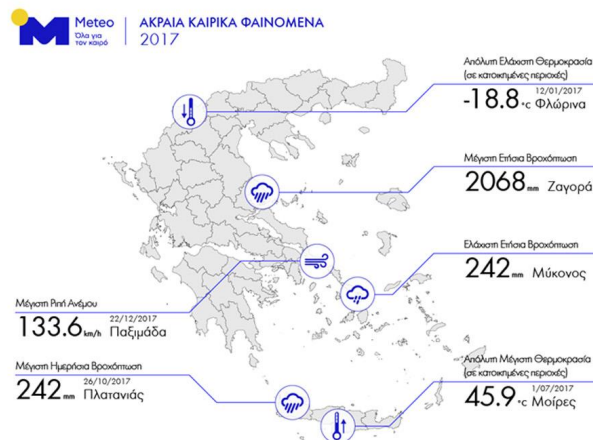
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The meteorological service of the National Observatory of Athens announced the record of the temperature, rainfall and wind speed recorded during 2017 in Greece.

According to the NOA's automatic weather station network, the temperature of 45.9 degrees Celsius recorded at Mires Heraklion on July 17, 2017, was the absolute maximum temperature of last year, but also the highest maximum temperature recorded in nearly 13 years its operation.

Also, the absolute minimum temperature in residential areas was -18.8 degrees Celsius in Florina on January 12, 2017, while the maximum wind gust was recorded in Paxi and was 133.6 km/h.

The maximum daily rainfall was in Platanias, Crete, on 26/10/2017, reaching 242mm. On an annual basis, the maximum rainfall occurred last year in Zagora Pelion, which received a total of 2,068 millimeters of rain. The minimum annual rainfall was recorded in Mykonos (242 mm throughout 2017).

The most notable finding was the temperature of 40.2 degrees Celsius recorded in Argos on 13/5/2017, which is the highest temperature ever recorded for the month of May.

Source: Meteo.gr
http://beaware-project.eu/the-extreme-weather-events-of-2017-in-greece/

Water levels hit critical level in Paris, France
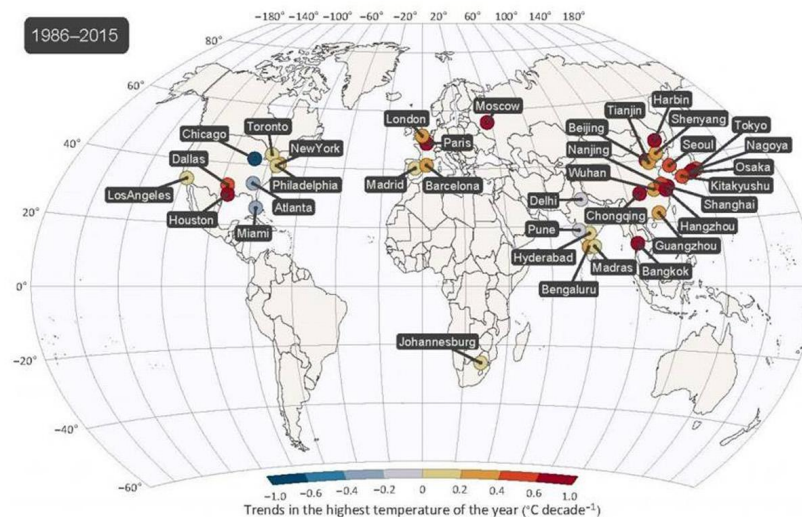
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The water levels of the Seine and Marne, two of major rivers in France crossing the capital Paris, have been steadily risen since last week, causing an evacuation of around 1.500 people as many streets and basements were flooded in the greater Paris metropolitan area. Fears have been expressed that the exceptional increased rainfall of the last weeks will further augment the water levels according to the flood warning agency Vigicrues. Even more alarming is the announcement coming from France's meteorological service, declaring the current December-January period as the third wettest on record since data collection began in 1900 (https://goo.gl/zwYwQK). Drone footage is showing the swollen Seine as it has peaked at more than four metres above its normal level (https://goo.gl/pSSK4Y).

Source: France24, BBC News, REUTERS
http://beaware-project.eu/water-levels-hit-critical-level-in-paris-france/

3. Cities face higher risks from the temperature rises

There is a general consensus among environmental scientists that the average Earth's temperature is slowly rising, but, according to a study coming from the University of California, the temperatures are rising even higher in the world's big cities during the hot days of the year.

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The survey reveals that, while the average annual temperature of our planet is rising with a slow but steady pace for many years, there is a worrying, much steeper, rise in extreme temperatures during the hottest days of the year. The situation is more noticeable – and more deadly – in the largest cities in the world, especially those with more than five million inhabitants.

Scientists analyzed the hottest days of the year from 8,848 weather stations around the world at a depth of 50 years, seeing an average increase of 0.19 degrees Celsius every decade, rising to 0.25 degrees a decade later, between 1986 -2015. (https://goo.gl/GnnB61).

"This dramatic urbanization, which has occurred more rapidly in the least-developed parts of the world, will aggravate the impacts of extreme weather events and increase the risk of heat-related fatalities in the future." the report noted.

Sources: UCI, REUTERS, In.gr

Europe's cities will face more extreme weather "beyond breaking point" a study suggests
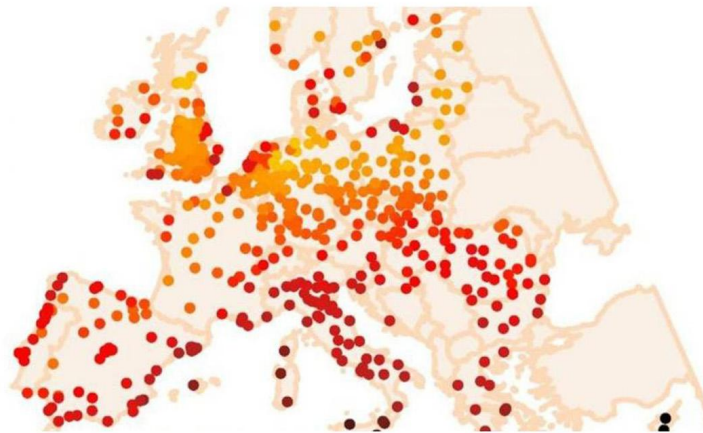
Researchers at the Newcastle University Polytechnic School published a study at the scientific journal Environmental Research Letters which highlights the urgent need to adapt urban areas to cope with extreme weather, and more precisely three areas that the beAWARE project is intended to tackle: floods, droughts and heatwaves. The study used all available climate models (based on three scenarios) to predict how the weather would evolve to 571 European cities by 2050-2100, focusing on the three above-mentioned phenomena.

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Even with the most optimistic of the three scenarios, the study predicts higher temperatures and worse heatwaves in 571 cities. Moreover, it estimates increased droughts mainly in southern Europe, an augmentation of floods in north-western Europe and a wider deterioration of the risks from extreme weather conditions in the majority of European cities.

Scientists predict that some parts of the European South can experience droughts up to 14 times worse than today. The five cities with the largest projected increases in drought are: Athens, Lisbon, Madrid, Nicosia and Sofia; with the largest increases in heatwaves are expected to be: Athens, Nicosia, Prague, Rome and Sofia, and those with the largest flooding increases will be: Dublin, Helsinki, Riga, Vilnius and Zagreb.

The lead author, Selma Guerreiro, said: "Although southern European regions are adapted to cope with droughts, this level of change could be beyond breaking point. Furthermore, most cities have considerable changes in more than one hazard, which highlights the substantial challenge cities face in managing climate risks." A co-author, Prof Richard Dawson, said: "The research highlights the urgent need to design and adapt our cities to cope with these future conditions."

beAWARE platform and its tools can play a vital role to cope with the challenges that the majority of the European cities will face in the next years coming from climate change and the deterioration of the extreme weather phenomena.

Sources: The Guardian, Skynews, IOPscience
http://beaware-project.eu/europes-cities-will-face-more-extreme-weather-beyond-breaking-point
-a-study-suggests/

Participation in Conferences/Workshops

2nd International Conference Citizen Observatories for natural hazards and Water Management 27-30 November 2018, Venice

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The Eastern Alps Hydrographic District, partner of BeAWARE, is organizing the **2nd International Conference** on **Citizen Observatories for natural hazards and Water Management (COWM)** that will take place in **Venice, Italy, from 27 to 30 November 2018.**

The COWM International Conference is a biennial event that has been organized since 2016. The first edition brought together specialists in water, water resources, soil and environmental protection (international academic communities, professionals, public administrations, businesses and engineering companies), and stimulated and promoted both research and real world applications: the presence of experts from worldwide (over 75 scientific presentations by leading experts coming from more than 15 nations - from Australia to the United States, from Scandinavia to South Africa), confirmed the importance on an international level of the data engineering processes that exploit the potential of citizens' collective intelligence, via mining of social media and monitoring of information provided directly by citizens.

The Conference **COWM2018** will be the stage for all the ongoing citizen science and crowdsourcing initiatives. COWM2018 will bring together social scientists, surveyors, engineers, scientists, and other professionals from many countries involved in research and development activities in a wide range of technical and management topics related to citizen observatories and their impacts on society. It will be an opportunity to discover how to maximize the benefit of data emerging from citizen observatories in the fields of Environmental Monitoring, Natural Risks management, Land use monitoring and management. Detailed information on the Conference programme and the call for abstracts can be found on the website: www.cowm.eu.

BeAWARE project will participate in the Conference submitting a contribution to the session **Crisis management and natural disaster resilience**, specifically about "Decision support in extreme weather climate events".

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ISCRAM Workshop

beAWARE project, in collaboration with I-React and AnywhereH2020, is organizing a workshop during the annual international conference ISCRAM2018 in Rochester, NY on May 20-23, The subject of the workshop is on information systems for crisis response and management of climate disasters including fires, floods, earthquakes and heatwaves.

For any additional information on the conference, or the submission process, click the following links:

- https://iscram2018.rit.edu/submissions
- https://www.conftool.pro/iscram2018/

ISCRAM 2018
Rochester Institute of Technology
Rochester, NY, USA

ISCRAM

acm In-Cooperation

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i REACT

ANYWHERE

1st International Workshop on Intelligent Crisis Management Technologies for climate events – ICMT - May 20th, 2018 http://mklab.iti.gr/icmt2018/

In conjunction with the 15th International Conference on INFORMATION SYSTEMS FOR CRISIS RESPONSE AND MANAGEMENT "Visualizing Crisis" https://iscram2018.rit.edu

ICMT welcomes novel research work that deals with new technologies to support rapid and efficient response to and management of the climate disasters including (but not limited to) fires, floods and heatwaves. The objective of the workshop is twofold. First, the workshop aims at presenting the most recent methods for forecasting, early warning, collection, processing, and transmission of the emergency data, analysis of multimedia data and coordination between the first responders and the authorities. Second, it aims at bringing together practitioners and researchers, both from crisis management and technical domains, to share ideas and experiences in designing and implementing novel intelligent techniques and tools to support crisis management.

All the workshop papers will be included in the main conference proceedings.

WORKSHOP TOPICS
- Information systems for crisis planning and crisis response
- Nowcasting and forecasting models
- Multirisk models
- Multimedia analysis for crisis management
- Data fusion, representation, and visualization
- Decision support systems
- Early warning systems
- Social Media for Crisis management
- Crowdsourcing systems & Gamification strategies for Disaster Risk Reduction
- Human-centered design for Disaster Risk Reduction (DRR)
- Accurate outdoor and indoor positioning technologies for emergency services
- Virtual and Augmented Reality applications for Emergency Response
- UAV applications and technologies for emergency services
- Big Data Analytics and architectures for emergency management

PAPER SUBMISSION
Papers should be 3000-6000 words, references included following the main conference template. See the conference website for additional information regarding the submission process: https://iscram2018.rit.edu/submissions
Submission URL: https://www.conftool.pro/iscram2018/

IMPORTANT DATES (tentative)
- Submission of full papers — January 28, 2018
- Notification of acceptance — February 5, 2018
- Camera ready versions submission — March 4, 2018
- Author advance registration — April 15, 2018

Third Plenary Meeting in Haifa, 29 November – 1 December 2017

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The third plenary meeting of the beAWARE project in Haifa, with the participation of the entire consortium, offered many interesting presentations and a great opportunity for all partners to catch up with their respecting colleagues. We would like to thank our host IBM for their excellent hospitality, and all the participants for the dedicated time in the presentations, discussions and meetings.

http://beaware-project.eu/461-2/

Partners of the Consortium

The partners that formulate the consortium of the project are:

Centre for Research and Technology Hellas (CERTH) - Coordinator

Motorola Solutions Israel Ltd (MSIL)

Universitat Pompeu Fabra (UPF)

Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB)

Valencia Local Police (PLV)

Hellenic Rescue Team (HRT)

Finnish Meteorological Institute (FMI)

Alto Adriatico Water Authority (AAWA)

IBM Israel - Science And Technology Ltd (IBM)

Frederiksborg Fire & Rescue Service (FBBR)