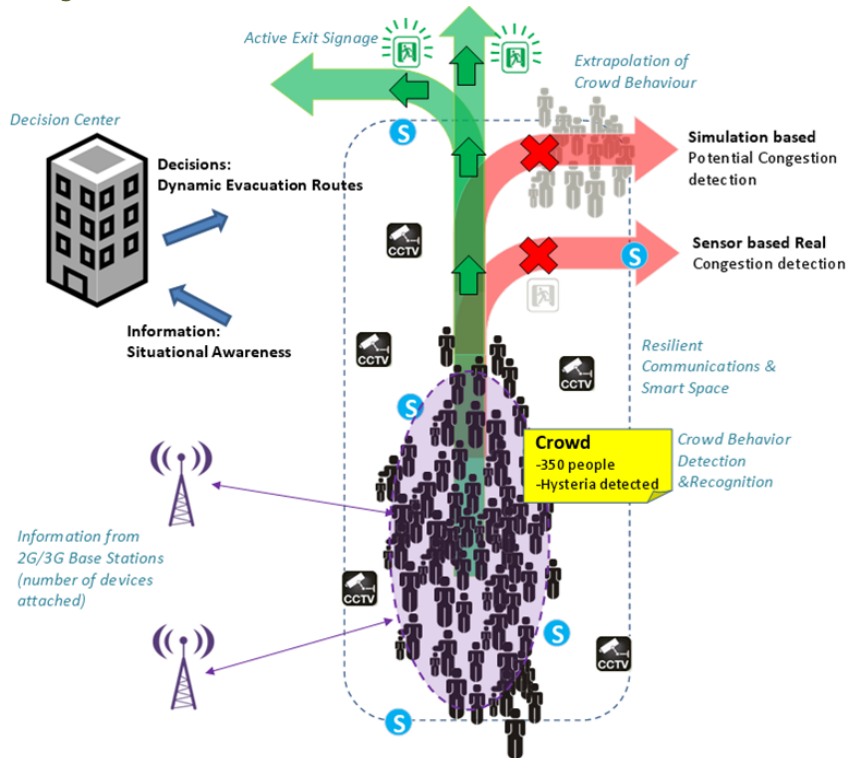


Project's Goal



eVACUATE aims to address the needs of the safety of citizens during complex evacuation processes following normal and abnormal events (crises) towards the creation of a holistic system that a) will enhance the effectiveness of complex evacuation operations at any type of venue or infrastructure, b) adapt evacuation plans to the current conditions, c) dynamically survey how an evacuation is evolved and d) support civil protection authorities. eVACUATE framework employs all key elements in the design and operation of the envisaged system; the eVACUATE **Crowd Models**, the **Simulator Tools**, the **Emergency Operations Control Centre** and finally the major constituent of all proposed work, which is the **Smart Spaces**.

The ultimate goal is to **identify, designate and sustain an Active Evacuation Route (AER)** comprised of the most recently generated evacuation route that adapts dynamically according to current and evolving circumstances.

Objectives

eVACUATE will yield a **holistic system**:

- ✱ To provide a valuable tool to guarantee **total Situation-Awareness** both to the crowds involved during a crisis but also to the crews operating in situ as well as in remote locations (security crews, first responders, crisis managers)
- ✱ To **adapt dynamically** evacuation plans to current conditions
- ✱ To provide a clear, easy to use (visual, multi-lingual) set of **safe evacuation instructions** for citizens/tourist/visitors, available over a multitude of alternative and complementary presentation channels under a resilient, reliable and robust way regardless of the functionality of the "global network"
- ✱ To set-up **visible demonstrations of innovative Crowd Evacuation Support Systems** in realistic situations
- ✱ To **support civil protection authorities** in the formation and validation of

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Project Information

Project full title:	A holistic, scenario-independent, situation-awareness and guidance system for sustaining the Active Evacuation Route for large crowds
Grant agreement no:	313161
Total budget:	13.135.530,71 €
EU Funding:	8.583.311,91 €
Start date:	1 st of April 2013
End date:	31 st of March 2017
Duration:	48 months
Total Man Power:	1340,83
Partners:	19
EU Countries:	8
Project Coordinator:	EXUS S.A
Web Site:	www.evacuate.eu



Contact Information

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Project co-funded by EU under FP7

Call identifier: FP7-SEC-2012

Work Programme SEC-2012.4.2-2
Obj.:

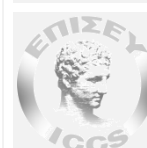
Consortium

EXUS

EXUS S.A.
(Coordinator),
Greece

UNIVERSITY OF
Southampton

IT Innovation, UK



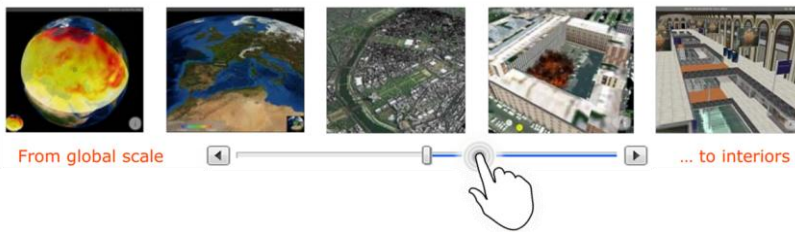
ICCS, Greece

proper safety procedures for crowd management (Reconstruction of Experiences)

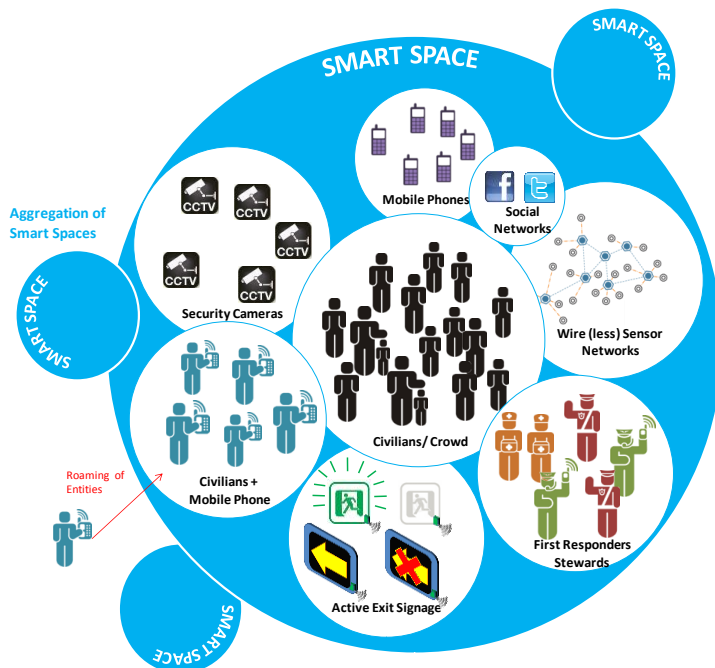
- ✧ To set a cornerstone for the **standardization of equipment, processes and methodologies** for evacuation purposes on a EU level addressing the cross-cultural issues emerging from diversity imposed by citizens.

Innovation - Technological components

- ✧ **Innovative Multi-scale behaviour recognition techniques:**
 - Micro-scale and Macro-scale behaviour recognition modelling
 - Hyper-spectral imaging and surveillance,
 - Innovative Deep learning and intelligence frameworks
- ✧ **3D common operational Pictures & Interactive Simulations**
 - 2D /3D content visualization
 - Inspection Tools supporting cutting planes, CSG operators, etc.
 - Scenario editor (visual creation of scenarios)
 - Seamless interactive multi-scale visualization of heterogeneous massive datasets



- ✧ **Innovative Advanced Strategic Spatial Evacuation simulation tools** combining leading crowd movement and evacuation algorithms, predictive software, feedback on future crowd congestion and optimum route choices based on the current system set-up and gathered real-time data.
- ✧ **Smart Spaces, sensing and communication**
 - **Sensing elements:** Cameras (either Wi-Fi or wired ones), Wireless Sensor Networks (e.g. multi-magnitude sensors: Temp, Smoke, vibration, sound-microphones), Autonomous wireless sensors that are easy to deploy and maintain self-healing, self-configurable, etc. Cell phones as 'people' sensors.
 - **Actuating Elements:** The elements and means to guide the crowd out of the risk situation. Will be active, already in place or requiring installation in order to answer a crisis situation (again self-configurable set of actuating elements). Examples of this kind of elements: Exit Signs, Led display, push notifications, etc.
 - **RFIDs and printing:** realization of a novel roll-to-roll printed RFID s on paper with extremely low cost, to enable apps. where conventional RFID concepts do not allow the use for cost reasons



HKV, Netherlands



Telesto Technologies, Greece



Tekniker-Ik4, Spain



Athens International Airport, Greece



Vitrociset s.p.a, Italy



Crowd Dynamics International, UK



INDRA, Spain



KU-Leuven, Belgium



DIGINEXT, France



Politecnico Di Torino –Dipartimento di Matematico, Italy



STX-France S.A, France



Technische Universität Dresden, Germany



Technische Universität Chemnitz, Germany



Real Sociedad De Futbol S.A.D, Spain

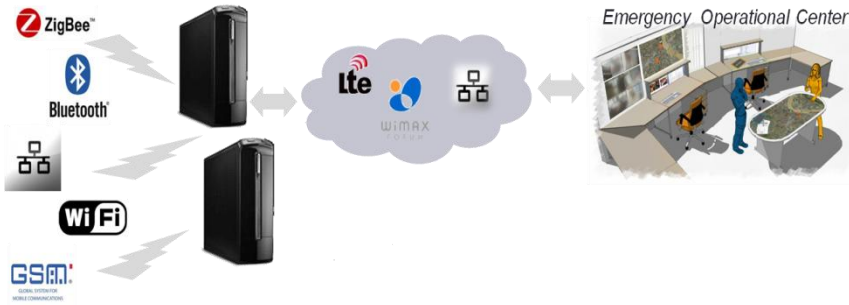


Metro Bilbao S.A, Spain



Telecom Italia, Italy

- ✳ **Advanced Integrated Situation Awareness System (SAS)** including:
 - Comprehensive incident information in an organized fashion during all phases of the incident
 - Management, communication, assignment and monitoring tasks for a wide variety of incidents performed by users
 - Multi-level security on how and if sensitive information will be shared
 - Interactive map with labelling capability
 - Seamless information flow to all channels (operators, responders, crowd)
 - Intelligent Information Management solutions
- ✳ **Resilient and robust Communication Technologies**
 - Wireless and wired communication Networks
 - Ad-hoc Networks
 - Cellular / Wireless Crisis Networks
 - PAN Networks (Bluetooth, ZigBee, RF, 802.11, etc.)
 - Overlay Virtual Network (OVN)

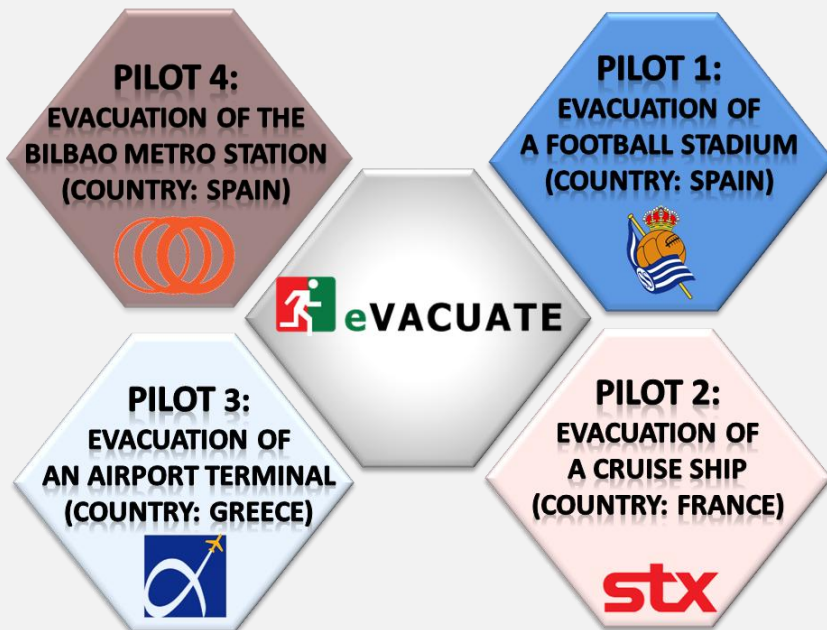


End Users involvement

From the collection of user requirements to the performance evaluation of eVACUATE products during pilot demos, potential end-users such as first responders, crisis managers, infrastructure managers, or public agencies are continuously and actively involved in the project. Thus, each step and interim outputs of the project are followed-up and validated by external users.



Validation and Field Demonstration



Our system will be tested at **lab scale** (running simulations) and at **field scale** during 4 pilot demonstrations (real evacuation exercises) involving :

- evacuation of a **Soccer Stadium - Real Sociedad de Futbol S.A.D** (Anoeta Stadium, San Sebastian, Spain)
- **Mustering and evacuation of passenger cruise ship- STX-FR** (Cruise Ship, France)
- **Airport evacuation-Athens International Airport** (Airport Terminal, Athens, Greece)
- **Metro Tube evacuation – Metro Bilbao S.A** (Metro Station, Bilbao City, Spain)

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Expected Impact

A system and evacuation strategy which guides people from the dangerous situations

eVACUATE integrated SAS captures situation awareness dynamically in time as the crisis unfolds. **The targeted time threshold for situation awareness updates is not exceeding 1 minute, through fast crowd engagement (behaviour) predictions and dynamic simulations**

Increase effectiveness of forces responding to crisis

eVACUATE integrated and advanced technologies will be applied to merge together different types of information sources thus providing an improved near real time situational awareness to the first force responders deployed on the field. **This approach will lead to a reduction of the response time of more than a 15% with respect to usual systems**

Reducing time in restoring security as a crisis unfolds

eVACUATE integrated SAS for decision support **leads to the reduction of evacuation times by average margins greater than 20% across scenarios**

Reduction of human error in restoring security as a crisis unfolds

The structured data fusion framework will enable the dynamic propagation of uncertainties across all fusion levels and its associated predictors (behaviour, crowd motions etc.). **The resulting uncertainty envelope is therefore quantified for decision-support at all time steps and enable decision-makers achieve better decisions with less human-induced errors.**

Reduction of collateral damage in restoring security as a crisis unfolds

The crowd engagement predictions, together with more realistic crowd dynamics simulation will lead to strategic spatial evacuation to safer zones. **The establishment of eVACUATE smart spaces for guiding crowd to safer zone in real-time will reduce collateral damage and faster restoration of security at the events venue and its affected proximities.**

Added Value at the EUROPEAN Level

- ✧ **Coordinated crisis** handling on the European Level
- ✧ **Best practices and guidelines** for setting-up strategic evacuation of crowd in emergency situations (**"The eVACUATE Book"**)
- ✧ **Contribution to Standards**