

SOTERIA

ONLINE AND MOBILE COMMUNICATIONS FOR EMERGENCIES

SOTERIA 1st Period Publishable Summary



Publishable Summary

Project context and objectives

SOTERIA aims at developing recommendations and a toolbox to leverage the positive impact that social media can play in emergencies, enabling public safety organisations (PSOs) and citizens to communicate before, during and after an emergency event. Empowered by new mobile phones with cameras, text messaging and internet-based applications connecting to social media, citizens expect PSOs to use the same technologies. The project looks at the ability of PSOs to effectively respond to emergency in the pre, during and post-event phases as well as the capacity of citizens to take an active role in the emergency response process through four dimensions (THEO approach):

- **Technological:** this dimension entails the integration of current ICT tools for emergencies and crises into the SOTERIA Toolbox so as to explore the real potential of mobile technologies and social media in emergencies and crises.
- **Human:** this dimension comprises the citizens' perspective on the impact, acceptance and adequate employment of state-of-the-art mobile and social media communication technologies in emergencies, concerning human factor analyses, message delivery channels and message content.
- **Ethical and Legal:** this dimension concerns both the commitment of the SOTERIA Consortium to stand by the relevant ethical principles and legal framework when developing and ethics-by-design project approach, and the ethical and legal considerations and waivers that discussions on privacy rights and public security boundaries might bring, regarding the use of new ICT tools in emergency response efforts.
- **Organisational:** this dimension focus on the public safety organisations and their culture, roles, processes, competences, training and technologies to explore how social media impacts their daily activity and how to adapt these organisations to include social media in their emergency procedures and management systems, building their trust in social media platforms and thus facilitating the process of introducing the SOTERIA Prototype into the organisations' operational processes.

The SOTERIA Prototype to be developed during the project, will comprise:

- SOTERIA Recommendations, to provide guidelines and courses of action for PSOs and citizens;
- SOTERIA Toolbox, integrating emergency-related ICT tools and functionality (e.g., social media tools and mobile applications) that offer additional communication channels between PSOs and citizens and enhance high-quality situational awareness for PSOs and citizens in emergencies.

SOTERIA shall innovate by allowing the (i) understanding of the impact that social media entails in emergency management systems; (ii) use of all communication channels in emergency situations, including social media, (iii) exploitation of the ubiquity of mobile platforms to locate and effectively communicate with citizens in distress; and (iv) leverage the levels of shared awareness and performance of PSOs, benefiting from social media information.

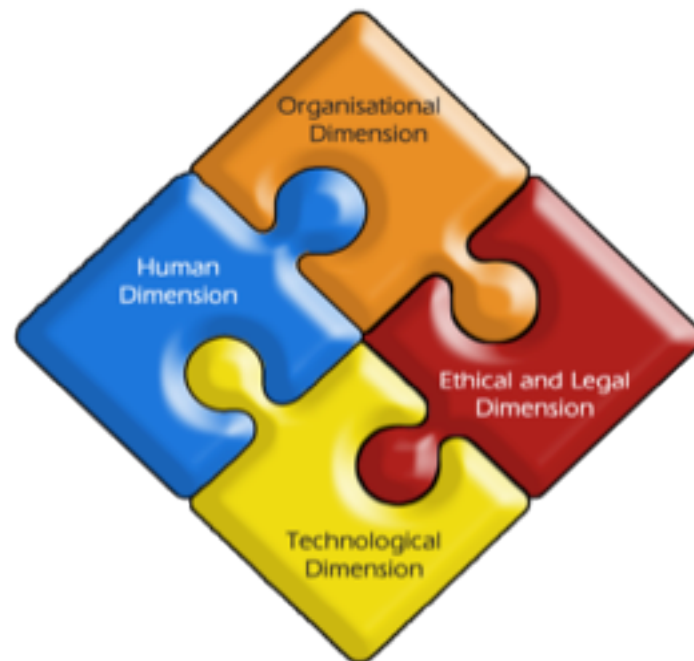


Figure 1 – The SOTERIA Project's Analysis Dimensions

Description of the work performed

The approach adopted by SOTERIA is based on the concept of Campaigns of Experimentation (CoE). Covering seven European and Turkish 112 emergency services models, the CoE aim to observe *in loco* how existing emergency management systems operate and which are the improvements brought by the SOTERIA Toolbox.

SOTERIA applies a three-phase methodology:

1. Retrospective Analysis Phase: in this phase, background knowledge for SOTERIA is consolidated, end-user needs and requirements are established and Key Performance Indicators (KPIs) are defined for the purpose of evaluating SOTERIA's impact.
2. Campaigns of Experimentation Phase: in this phase, SOTERIA is incorporated and tested in emergency services across several countries; these campaigns are performed *in loco*, extracting data and measurements from current 112 emergency services, operating without and with SOTERIA.
3. Recommendations and Dissemination Phase: in this phase, SOTERIA produces recommendations on the impact and integration of social media in emergency management systems and disseminate the results of the prototype testing.

So far, the project concluded the retrospective analysis phase and initiated the CoE phase.

A number of European countries' 112 emergency models were analysed in depth. Hundreds of user requirements were drawn from citizens surveys, reference scenarios, end-user organizations and interviews with PSOs.

KPIs were derived from the reference scenarios (making the point clearly that the project is not evaluating the performance of the PSOs per se, but the *added value* that SOTERIA

brings to their operations) and their implications for the THEO framework were established. The consortium organized a first workshop in Portugal with multiple end-users to discuss the requirements and to present the SOTERIA Mockup (a preliminary version of the SOTERIA Prototype).

Under the organizational pillar it was found that heterogeneity within and across jurisdictions underpins many of the findings of the initial analysis of PSOs. There are many examples of the use of online and mobile communications by PSOs in Europe, mainly for dissemination purposes that replicate the traditional media broadcasts. There is little consistency in the use of online and mobile communication technologies by PSOs.

Under the Human pillar, a classification taxonomy for emergencies was developed. This classification was validated using input from the public. A multinational survey as well as an additional survey with a German sub-sample have been conducted, also with a view towards compiling information on the perception of social media and usage behaviour of the citizen.

With respect to the ethical and legal aspects, the consortium mapped current concerns and mitigation strategies employed through case studies. Current applicable legislation was analysed to create a legal and ethical framework for the project. The Charter of Fundamental Rights of the European Union (CFREU), the EC Directive on privacy and electronic communications (58/2002/EC) and the data protection Directive 95/46/EC were studied. The project also requested and received a Data Protection Approval for the 2015 Barents Rescue Exercise in Finland.

In the technology axis, the SOTERIA Toolbox Framework was established. This defines a Generic API based on web services which provide a standard procedure to include tools in the toolbox. Social Network connectors can be implemented and can be activated so that one could interact directly with Social Network platforms. The integration of some tools may require a customized integration and specific development.

Initial instances of SOTERIA platform web interface and mobile application, the Text Analysis Tool Tweet locator (TAT2), POMOC application and data fusion components were tested and evaluated.

Finally, a first version of the CoE Plan was refined during the Barents Rescue 2015 Exercise. Using the observations of and feedback from the exercise as inputs, SOTERIA CoE were clearly divided into four separate campaigns which include a number of experimentations conducted in several countries:

1. SOTERIA in emergencies, Command and control centre level
2. SOTERIA in emergencies, Operational (field) level
3. Observation Campaign
4. Integration Campaign

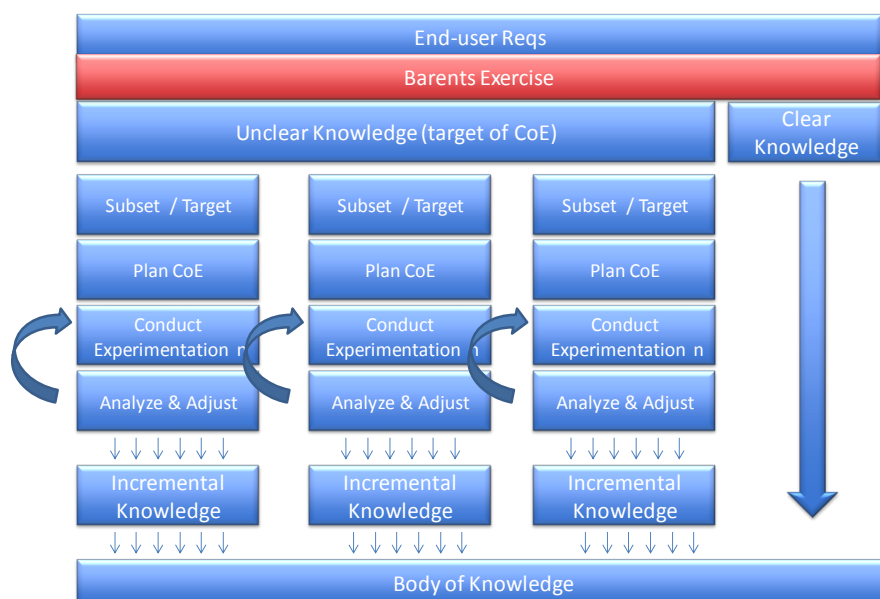


Figure 2 – CoE towards the building of Body of Knowledge

SOTERIA Architecture

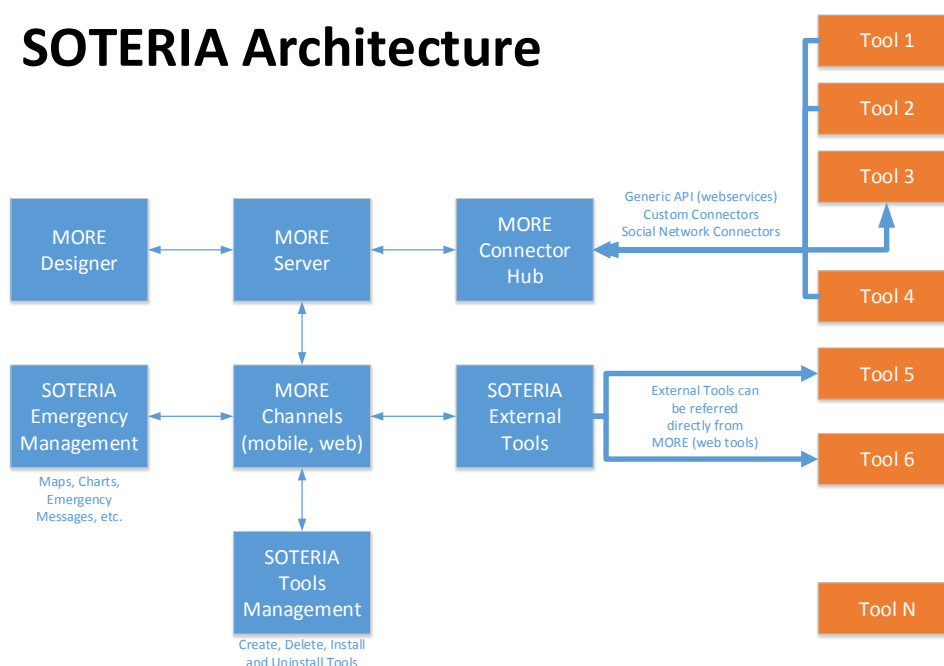


Figure 3 – Proposed SOTERIA toolbox architecture.

Expected final results and their potential impacts

The main results from SOTERIA are expected to be threefold:

- A set of recommendations for the use of social media technologies and tools in emergencies;
- A professional SOTERIA toolbox for emergency response;

- A set of tools based on social media for use by citizens.

The professional and citizen toolboxes will be designed taking into account the organisational culture of emergency services and the European Union's legislation and concerns on privacy, as well as the related human and technological dimensions. These will enable PSOs to understand the benefits of social media in emergencies and to gradually adopt these technologies in their daily activities, assisting in the safeguard of citizens in emergency and crisis situations.

With SOTERIA, citizens may reach PSOs using multiple and richer communication channels and benefit from different emergency-related tooling, carefully selected to assist them and PSOs considering their needs, requirements, habits and shortcomings, in face of specific emergency situations. The information conveyed in SOTERIA will be multi-purpose, thus relevant for police, law enforcement agencies (e.g., crowdsourced information, supported by imagery and real-time video in a given area), first responders (e.g., crowdsourced information about citizens in an affected area) and medical personnel (e.g., image of an injured person). Also, the SOTERIA Toolbox includes a suite of tools that allow linking detection, reporting and rescue stages of an emergency operation:

- ON DETECTION - SOTERIA offers an entry point where citizens (oriented for the use of new media) may report emergencies with additional supporting data (in image or video formats);
- ON REPORTING - SOTERIA allows citizens and PSOs to post emergency-related information in numerous forms;
- ON RESCUE - SOTERIA includes a set of tools (e.g., crowdsourcing), delivering the possibility to exploit mobile technology to locate citizens in affected areas thus reducing the time to search and locate and, consequently, PSOs' response time;
- ON PREVENTION - SOTERIA is a permanent information source for citizens on emerging nearby dangers and hazards; as a training tool, SOTERIA's strong presence online (also in social media networks), educational and training manuals, Recommendations, Social Media Roadmap and Toolbox freely available to all SOTERIA friends and followers, empowers a well informed society in what regards emergencies, crises and safety and security purposes.

SOTERIA also contributes to two areas that are particularly close to citizens' welfare, safety and quality of life: emergencies and information technology. SOTERIA will provide for the natural and ethically acceptable forms to adopt, use and benefit from social media and the rich communication it promotes, before, during and after emergencies. In these stressful, often life-threatening situations, citizens and PSOs have now the opportunity to be and feel empowered, with a Toolbox and Recommendations that guide them through the use of social media to acquire and share the right information and help PSOs and fellow citizens.

With a differentiating systemic and systematic research approach (the THEO and CoE approaches), SOTERIA will hold a major scientific impact on how current research efforts are undertaken in the professional emergency sector.

Finally, the SOTERIA Toolbox is not meant to be a stand-alone platform. It is designed to be integrated with existing 112 services' technological frameworks and it will also accommodate interfaces with external systems, namely those in use by other SOTERIA emergency authorities' users.