Emergency Services Europe Network

Publishable Summary

In two years of work, the EC-funded FP7 project ESENet (Emergency Services Europe Network) set up a network of some 60 experts from different fields of expertise across Europe, coming both from the Emergency Services and Public Authorities and from industries promoting products and services in the Emergency Management domains. The network identified several recommendations for tackling the identified interoperability needs emerging from the society and for embracing the recent technologies nowadays available for the public and not yet adopted by Emergency Services.

Fundamental concepts like accessibility, IP-based emergency systems, data interoperability, emergency radio communication, use of social media for emergency management and control room robustness, have been analysed and discussed, aiming at both improving the current systems towards a common European vision of emergency services and providing an outlook on what the next generation of Emergency Services should be able to offer to our society.

A complete coverage of the different phases of communication during an emergency (from Citizens to Authorities, between Authorities and from Authorities to Citizens) has led to the definition of a set of recommendations offered to the European Commission, the Member States and the Emergency Services for implementing a number of actions in the areas of legal provisions, standardisation efforts, further research, implementation and monitoring.

The large corpus of results has been conveniently organised around the different layers in which interoperability between agencies and stakeholders can be structured, thus allowing for an efficient use of the knowledge base. This structure also allows for an effective analysis of what the experts from Public Authorities, Emergency Services and Industries have identified as the next challenges for the establishment of a safer and more secure Europe.

To report such a large amount of information in a compact, useful and direct way, the project created the concept of "Stories" that allowed to cluster topics and recommendations under a single title; in such way the project managed to write meaningful, motivating, compelling subjects for an initiative that should raise interest in the reader and trigger for actions.
As a conclusion from the entire cycle of discussions and meeting with the experts, the 10 "Top Stories" were identified, discussed, approved and reported.

The project has also executed a number of actions for disseminating the project and for getting in touch with the largest number of stakeholders.

1.1 Adopted Methodology

The project consisted of 9 webinars and 4 workshops and the primary topic discussed have been communication interoperability at all levels (from the technical level to the organizational level) and in all types of safety and security missions (daily/ordinary and/or large scale missions as well as local or cross-border missions). Activities were arranged in 4 cycles, the first three of which focused on the discussions with experts about interoperability issues and the fourth aiming at the consolidation of the recommendations. For each cycle, 2 webinars and 1 workshop have been executed, with a final webinar organized for the sharing of the project findings with the network of experts.

The project has organised its process for identifying existing interoperability gaps in the Emergency communication chain along two main axes:

- Level in the interoperability stack on which the gap impacts and
- Part of the communication cycle between Citizens and Authorities.

For each primary topic of discussion in a discussion cycle, the project partners prepared a list of supporting documents (including definitions where appropriate), comprehensive introductory text and a preliminary allocation of the sub-topics on the interoperability layers. During the webinars, each topic was introduced and discussed to get early feedbacks and comments from the experts. These inputs were then used for completing the supporting documents to the face-to-face workshops, during which each sub-topic was discussed thoroughly until recommendations were identified, classified per kind of action and allocated to the intended actors.

1.1.1 Interoperability layers

The word “interoperability” can be found more and more often when discussing the complexity of making systems work. It is quite a difficult word and hides inside it a large number of concepts. Basically it means “make different systems able to operate together”. Indeed, in Emergency Management it can be seen as the primary need at all levels for taking decisions and managing operations.

To help the understanding of the organisational processes in Emergency situations, the SECRICOM project (http://secricom.eu/) introduced a useful structure based on “Interoperability Layers”, giving a synthetic form to all the needed components for realising a full and effective cooperation between Emergency Organisations. Such a scheme, shown below in Figure 1, is more representative of the challenges of interoperating in emergencies than the simpler model proposed by the European Interoperability Framework, that is limited to 4 layers (Legal, Organisational, Semantic and Technical).

The adopted "Interoperability Stack" shows how the crucial challenge of ensuring Interoperability and communication between Emergency Organisations requires the implementation of several levels of Interoperability, ranging from the basic physical interoperability of devices to the agreement of political objectives of the organisations. For the purposes of the project, it gave also more flexibility for the identification of gaps and recommendations than the "Interoperability Continuum" defined by the SAFECOM program of the U.S. Department of Homeland Security, that defined a roadmap to an optimal level of interoperability defined in 5 layers (Governance, Standard Operating Procedures, Technology, Training & Exercises and Usage).

The organization of the layers is bottom-up (i.e. from the Technical Layers up to the Organisational ones) and the central layer ("knowledge/awareness") is where both technical and organisational strands tend to: it represents the ultimate goal of the whole concept of interoperability in Emergency Management.

All discussions within the ESENet meetings about relevant topics have been started by allocating them to the appropriate layer(s).

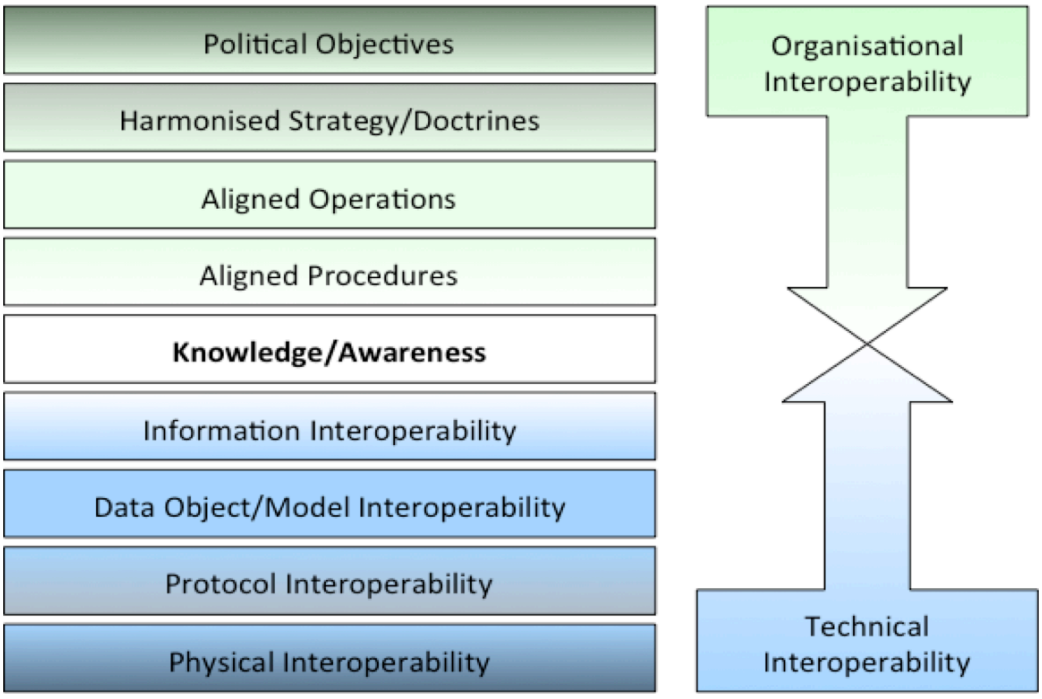

Figure 1 – Layers of interoperability (source: SECRICOM project)

1.1.2 Communication cycles

ESENet has targeted Emergency Communication between two main categories of actors: Citizens and Authorities. Their needs for communicating have been investigated during three phases:

- **Citizen to Authority (C2A):** this includes all kind of communication initiated by citizens in need for help by any kind of organisation or Agency responsible for providing Emergency Services and Rescue; we have adopted for them the term "Authority"
- **Authority to Authority (A2A)**: this type of communication happens between Authorities in need for exchanging information and resources about an incident; it may stay within one Authority or involve different Authorities from one or more countries
- **Authority to Citizens (A2C)**: this covers all the needs for Authorities when communicating back to Citizens and informing them about an evolving situation.

The Project did not investigate communication from Citizens to Citizens (C2C) because this cycle does not involve Authorities and Emergency Services. It is understood by the project that this may have left out part of the recent trends in the use of Social Media (i.e. crowd sourcing), which are, however, covered by other projects funded by the European Commission (e.g. EMERGENT (http://www.fp7-emergent.eu/), COSMIC (http://www.cosmic-project.eu/), iSAR+ (http://isar.i112.eu/) and ATHENA (http://www.westyorkshire.police.uk/athena).

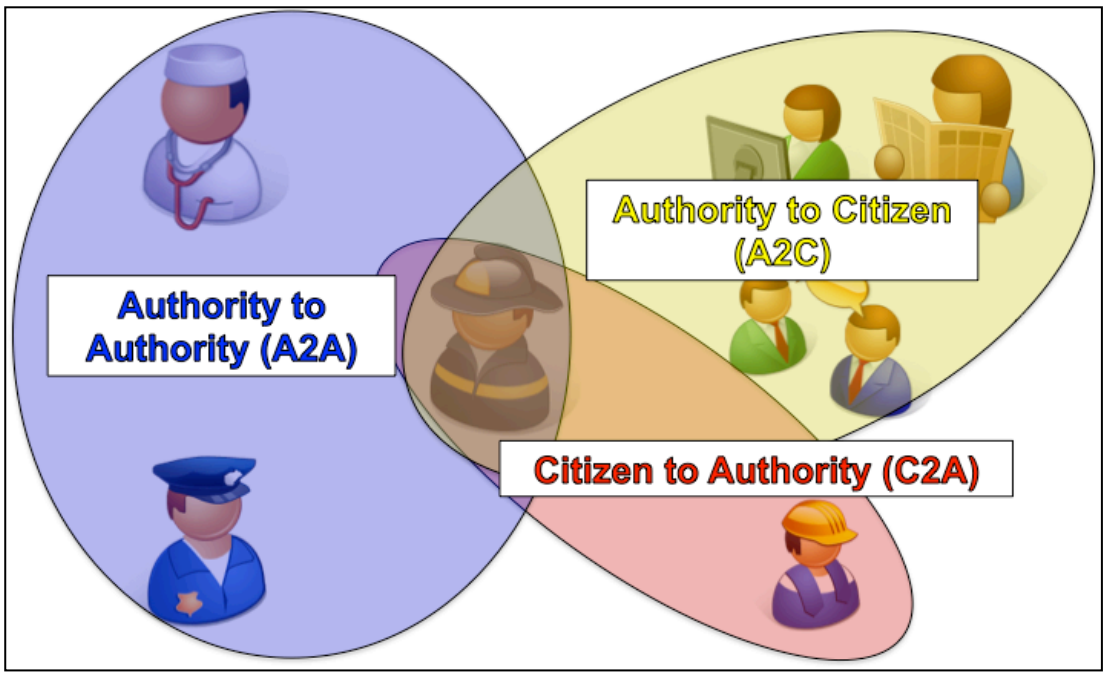

Figure 2 – Phases of communication

1.2 Classification of the project results

Discussions with the experts were aimed at identifying not only the major topics of interest for them (i.e. the gaps in the interoperability chain that need to be addressed), but mainly to discuss and agree on which kind of action would be more appropriate to tackle the challenge and which actor should be requested to take the initiatives. During the first webinars, the feedbacks received by the experts allowed the project partners to identify the most effective classifications of actions and actors for covering the received recommendations. Such classification, detailed in the following, has not been proposed previously in other projects and proved very efficient throughout the project.

1.2.1 Possible actions

Four major possible actions, mainly related to the maturity of the intended solution, were proposed to the experts during the workshops:

- **Legal (LEG)**: the topic is still in need for a legal framework to be established. Without such framework, fragmented or uncoordinated implementations may be deployed at different levels. Moreover, without clear provisions, in some cases funds may not be allocated for the implementation of existing solutions;
- **Research (RTD)**: Even with a set of regulations in place, the technical solutions available on the market are not up to the point and additional Research and Development (R&D) is called for. For the purpose of ESENet, such R&D actions cover the full range of research (basic or applied) where private funds from industries may not be enough or may lead to un-needed proprietary solutions;
- **Standards (STD)**: Technology is available and ready to be used for concrete solutions, but a common standard (or set of standards) is missing or incomplete. This may lead to uncoordinated solutions and even to incompatible systems deployed across Europe, creating additional barriers to full interoperability. Activities by standardisation bodies or the setting up of mandates and ad hoc groups is called for;
- **Implementation and Monitoring (I&M)**: The scene is fully set up. The legal framework is defined, technology is available, and standard and technical guidelines are defined. Solutions must be now implemented and a monitoring activity by control bodies is required to actually achieve the intended goal.

Of course, experts had the freedom to suggest any combination of the above four actions.

1.2.2 Possible actors

Three possible levels of actors were suggested to the experts, aiming at covering the entire range of responsibilities along the Emergency Management domain:

- **European Commission (EC)**: This actor level encompasses all bodies and committees at European level, including the Parliament, the Commission and its Directorates, the Agencies and Standardisation bodies. Experts were invited to pinpoint what body would be the most appropriate to act
- **Member States (MS)**: again, this level includes any decision level in Member States, including multi-lateral agreements or transnational initiatives outside of the "European" initiatives
- **Emergency Services (ES)**: at this level, actions are manageable by emergency services, which should be required to set different priorities or act together with their Authorities for acting.

Again, experts had the possibility to suggest any combination of the above actors.

1.3 Topics covered in the project

The project and the network of experts have discussed a large number of topics, very briefly summarised in the following. The selection of the topics was firstly inspired by the activities of the Operation Committee of EENA and validated by the ESENet experts.
More details are available in the project deliverables, available at the project website (http://www.esenet.org/).

1.3.1 Citizens to Authorities

- Access to Public Safety Answering Point (PSAP)
- Voice and data communication
- PSAP equipment

This part of the communication cycle touches specifically on the way citizens can reach Authorities, therefore includes the use of several devices and networks, as well as accessibility by citizens with disabilities. Moreover, it covered the equipment, facilities and tools available at the PSAP side for manage the calls from citizens in an appropriate and efficient way.

1.3.2 Authorities to Authorities

- Interoperability with and between responders
- Next Generation 112
- Interoperability between Control Rooms
- Interoperability beyond Capacity of PSAPs
- Contingency management

This cycle of communication was very much focused on radio communication and data interoperability, with an important discussion opened on the management of situations depending on the level of crisis is faced.

1.3.3 Authorities to Citizens

- Communication Channels
- Next Generation Channels
- Agency coordination for citizens warning

This portion of communication includes the many different ways that an Authority may adopt for communicating with Citizens, ranging from sirens to radio, from websites to dedicated Apps for smartphones and Social Media. All of them imply ethical issues and liabilities that cannot be dismissed or underestimated.

1.4 Analysis of the results

The results form each cycle of discussion have been classified and analysed according to the explained methodology, allowing a preliminary assessment of the areas identified by the experts as more in need for actions. That large number of identified recommendations (180 unique recommendations in in 42 topics under 10 categories) forms a large corpus of knowledge that for each cycle of discussion can be represented in a three-dimensional space, with the three axes being (i) the interoperability layers, (ii) the identified actions and (iii) the suggested actors.

Details on the received recommendations can be browsed using a dedicated web-tool offered by the project and available at http://www.esenet.org/results/results-from-the-workshops/.

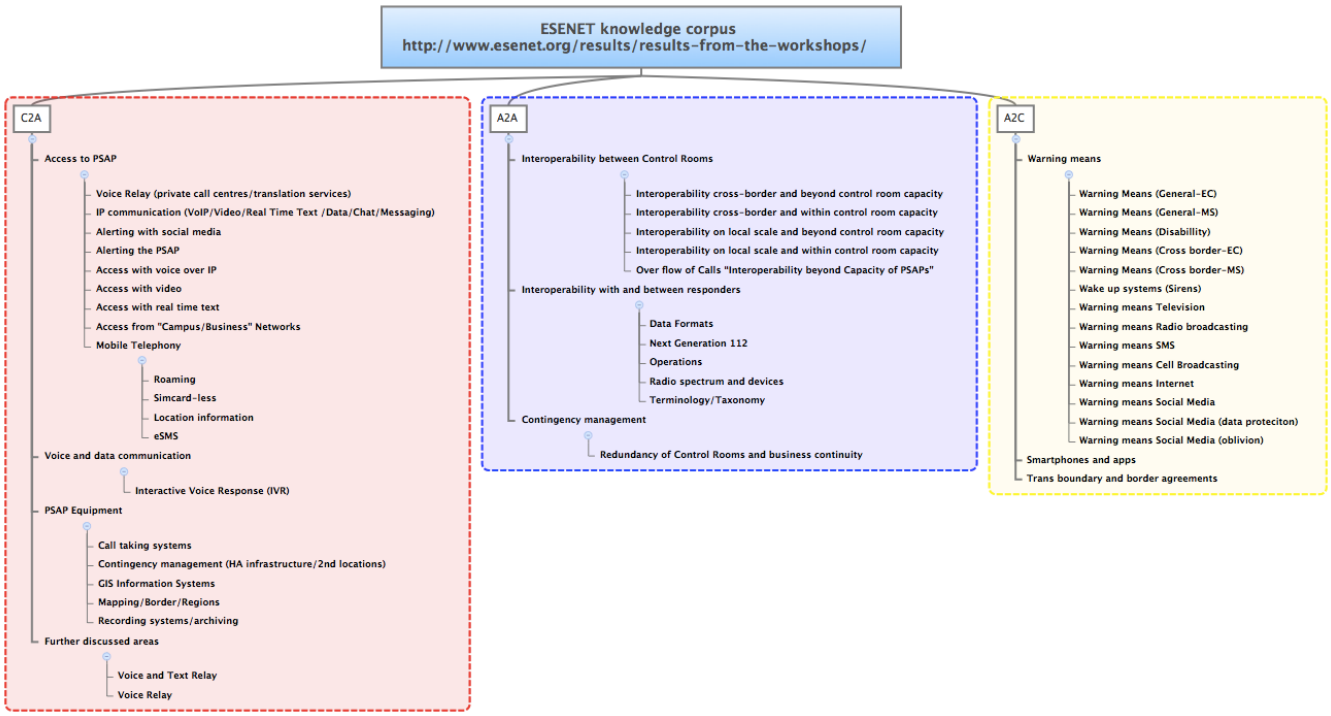

Figure 3 – A MindMap of the 180 unique recommendations received

As a conclusion from the entire cycle of discussions and meeting with the experts, the following "Top Stories" were identified and approved:

- Top Story 1 - Basic caller access and information
- Top Story 2 - Management of trans-national emergency calls
- Top Story 3 - Interaction in case of an emergency
- Top Story 4 - Mission Critical Communication
- Top Story 5 – Moving forward to NG112
- Top Story 6 – Harmonisation of public warning systems
- Top Story 7 - Data exchange between Emergency Services
- Top Story 8 - Cross-border cooperation during emergencies
- Top Story 9 - Business continuity and contingency management
- Top Story 10 - Improved call management

All "Top Stories" were included in the final report from the project, available for public download form the ESENet project website.

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