Foreword

Internet and social media have become an integral part of life for many people. As the reliance on mobile communication devices increases more and more in the daily routines (e.g. mobile communicating via e-mail and through Social Networking Sites, retrieving the news, navigating with help of GPS, getting support in online forums), it seems natural that people will also rely on this communication form when it comes to crisis situation – may it be as a witness, bystander or victim.

From the standpoint of First Responders (FRs) and Public Protection and Disaster Relief (PPDR) organizations, it is therefore important, not only to be aware of this development, but also to take measure and develop procedures, guidelines and tools to incorporate (mobile) online communication as an additional information and communication channel.

The present book describes the results of the project iSAR+ which was funded under the European Union Framework Programme 7 – Security (contract No. 312850) and investigated the views of citizens as well as First Responders concerning the integration of new technologies in the course of crisis management.

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1 New media – Perspectives in crisis

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Worldwide crises recently prompted new attention to the role information communication technology (ICT) play in search and rescue (SAR) operations and response efforts. With a century old history of investigation, the sociological study of crises is aware that ICT expanded the reach of disaster sociology and is now focused on the emerging trend of the growing citizens' participation through online (social) media and mobile communications (computer-mediated interaction), providing, seeking and brokering information, connecting those within and outside the geographical space of the crisis, with implications for both informal and formal response. However, First Responders (FRs) and Public Protection and Disaster Relief (PPDR) organisations and their traditional command and control models, do not easily adapt to the new crises' trend of including a global, digitally enabled social arena

Over the last 15 years (2000-2015), the increasing adoption of mobile technology has driven global development in an unprecedented way, as reported in the International Telecommunication Union (ITU) report "The World in 2015: ICT Facts and Figures" (refer to http://www.itu.int):

"Over the past 15 years the ICT revolution has driven global development in an unprecedented way. Technological progress, infrastructure deployment, and falling prices have brought unexpected growth in ICT access and connectivity to billions of people around the world. In 2015 there are more than 7 billion mobile cellular subscriptions worldwide, up from less than 1 billion in 2000. Globally 3.2 billion people are using the Internet of which 2 billion are from developing countries. ICTs will play an even more significant role in the post 2015 development agenda and in achieving future sustainable development goals as the world moves faster and faster towards a digital society. Our mission is to connect everyone and to create a truly inclusive information society, for which we need comparable and high-quality data and statistics to measure progress".

Particularly in Europe, this report states that 82.1% of households have internet, 77.6% of individuals use internet, 78.2 inhabitants subscribed mobile-broadband while only 29.6 subscribed fixed-broadband.

Citizens' substantial preference for and adoption of mobile technology, with an overwhelming adoption of smartphones, paired with active information producer-consumer behaviour, via online social media platforms, should be taken seriously. This new reality presents itself as an opportunity, to be positively exploited to en-

hance citizens' involvement and contribution to emergency communications, crisis response and SAR actions, strongly benefiting all involved, FRs, PPDRs and, ultimately, citizens.

1.1 The Worldwide Reality of Crisis Response Efforts in the Information Age

Large-scale natural disasters and human-induced emergencies, or simply crises, disturb routines and raise significant public scrutiny and undivided media attention, a reality that is not dissociable of today's global emphasis in ICT. Today, mobile and online social media are dramatically changing geopolitics, economic contexts and business competitiveness, that is, transforming societies, a catharsis that is also present in the potential for an improved response to disasters and crisis response efforts.

Throughout History, several overwhelming natural disasters and human-induced actions have prompted crisis response efforts that have made their mark, providing valuable lessons on crisis management systems, plans and organisations. These lessons revealed that, in emergencies and crisis, amidst the collapse of all critical infrastructures, communications withstand extreme damage or destruction. Landline phone networks are unavailable or intermittently available, with the surviving stations of the 112 or 911 emergency service rapidly becoming overwhelmed by the incoming volume of calls, as occurred in, for example, the 9/11 terrorist attacks, the Madrid train bombings, Boston marathon terrorist attacks and the London tube explosions.

In fact, ICT have proven their worth in providing both PPDRs and the public the scarcest resource in crisis situations: information. In a society that has grown accustomed to immediacy and instantaneity, ICT and their strong real-time emphasis are fundamental to gather and deliver information, not only in terms of alert and emergency notifications but also respecting the attainment of the most complete situational awareness picture. And yet the large majority of official PPDR channels do not include online social media, instead choosing to practice a unidirectional information dissemination model towards the public, that is often scarce in availability, details and empathy and usually resorts to the traditional TV and radio broadcasts – in the Californian Wildfires and the Norwegian massacre, those media have been heavily criticised for being prone to sensationalism and irresponsive to the local communities' real needs. Communicating with the public is always a challenge, a difficulty further highlighted in the 2005 London Tube attacks, for the United Kingdom's Data Protection Act prohibits sharing personal data without the consent of those concerned, thus limiting what information officials could give agencies and families on the identity and status of victims. Indeed, crises such as this question the balance between individual privacy and public security.

As a result of the repetitive lack of official information, and because it is rare the high-levels of preparedness of some societies, such as the Chilean people , citizens choose the rich contents provided through the mobile and online social media

technologies, requesting assistance, looking for information and trying to locate missing relatives and friends. This is why, over the long span of the Chinese SARS outbreak crisis, 120 million text messages were exchanged and, immediately after the 2010 Great Japan Earthquake, Twitter became the emergency service with 1200 tweets per minute or even why Mission 4636 received 1000 SMSs per day. Moreover, the growing global phenomenon of citizens' journalism through the online social media has been instrumental in providing eye-witness accounts and first reports from the affected areas, thus contributing to the enhancement of the general public's situational awareness in crisis situations and SAR actions – it was so in natural catastrophes like the 2004 Indian Ocean Tsunami, the 2005 Hurricane Katrina and the 2010 Haiti Earthquake, but also in the US, London and Madrid terrorist attacks. Also volunteering across the Globe and the use of ICT tools have prompted citizens' initiatives like the South East Asia Earthquake and Tsunami Blog , the Digitales por Chile or the Ushahidi platform to became useful sources of information on the crisis' evolving situation, the relief assistance and the tracking of missing persons.

Notwithstanding the amazing Facebook, Twitter, Flickr, YouTube, instant messaging, SMS, MMS and Emails technologies' benefits, it is also relevant to bear in mind its misuses and abuses. Not only they are extremely efficient instruments for defamation, slander, rumour and misguidance, but also social networking platforms have proven to serve as tools of change, in the 2011 Middle East upheavals to respectively organise protests and in the 2011 UK riots to coordinate looting activities. Today, there is an ongoing debate whether these tools should be further monitored or controlled, a matter that the Chinese government already resolved during the 2003 SARS Epidemic, when it used Operation Golden Shield to prevent public unrest.

The harsh reality of the crisis response efforts analysed often refers that PPDRs seldom have the ability to fully implement the national official emergency plan, carefully thought and defined to provide an effective and efficient response to crisis events. Upon a large-scale crisis, authorities would activate the emergency plan and overall crisis response effort coordination would be handled by the National Civil Protection Authority that could also request assistance from international civil protection mechanisms. An emergency plan mainly establishes which actors are involved and their respective responsibilities and the relevant communication and information flows to maintain between all entities involved, on behalf of shared awareness and of effective command, control and coordination. Specifically, there is concern for the general public and the media to be properly informed, so as to be able to follow the instructions provided by authorities and adopt the most auto-protective measures. There is no reference to Internet-based tools (e.g., institutional webpages or Email) or to social media (e.g., Facebook or Twitter) as additional means for informing and contacting citizens, reinforcing the model's underlying unidirectionality.

Considering EC's civil protection framework the national responsibility to deal directly with crisis is unchallenged but it is significantly facilitated by the sharing of Community resources, through the Community Mechanism for Civil Protection that

has provided civil protection assistance in various natural and man-made crisis. Based on the MIC and CECIS tools, the Community Mechanism for Civil Protection functions as a web-based coordinator communication hub application that receives each Member States' information on existing national civil protection capabilities, military and medical resources, that disseminates all assistance requests by crisis-stricken countries, that matches the available response resources with the required crisis needs and informs civil protection authorities and citizens about the progress of ongoing crises with validated emergency information. Upon the active engagement of this Mechanism, crisis-stricken countries benefit from one or more civil protection modules of the European civil protection rapid response capability, called for by the European Council in June 2005 and by the European Parliament in its Resolution in January 2005 on the tsunami disaster.

In conclusion, the European civil protection framework, as well as the reports and evaluations from past crisis events and national emergency plans have enlighten us that: (1) PPDRs emergency services rapidly become overloaded or inoperational, including the emergency call service, disabling citizens to reach PPDRs; (2) short-text messaging has proven to be a resilient and efficient way for citizens to communicate (via SMS cellular, Twitter or Facebook) heavily (e.g., 5530 TPS during the Japan Earthquake as referred before) and save lives in the process (e.g., Mission 4636); (3) PPDRs do not regard social media as a valid authoritative tool to use nor they exploit the enormous potential of locating, reaching and communicating with citizens via their mobile technology. In fact, PPDRs still follow structures, models and approaches defined well before the Information Age.

The straightforwardness of the classic European approach to crisis response efforts and the natural and human-provoked crises here presented do tackle the diversified aspects that convey today's crisis response efforts and citizens' involvement, particularly through the use of mobile technology and social media communications. Together with the statistics that prove the growing global trend of online and mobile adoption, these examples are true accounts of the current state-of-the-art in the use of new communication/social media in crisis situations. Still, it is worth noting the few exceptions that demonstrate the potential of that use, even when the example for these new ICT tools for crisis management is provided by the civil society.

1.2 A New Era for ICT Tools in Crisis Situations?

From the Haiti's earthquake to the Japan's tsunami, from the Katrina hurricane to the Californian wildfires, from the Virginia Tech shootings to the Norwegian island massacre, from the upheavals in the Middle East to the English riots, peer-to-peer communications, through mobile phones and social media, text and instant messaging applications, blogs, wikis and web fora, have become the designated ways for citizens to be involved and active in society, in crisis events.

Citizens' engagement, strongly enabled by social media and mobile technology, is supporting the dissemination of information, often critical and accurate, into the

public sphere: providing eye-witness accounts, sending alert messages, exchanging evacuation and rescue experiences, searching and publishing event-related information, volunteering goods and services, collecting donatives. More than mere information distribution tools, these technologies connect people and information, establish collaboration mechanisms, create informal networks and build no-boundary communities. With a strong emphasis on real-time, new mobile and online technologies have significantly improved the affected citizens' and the victims' capability to help each other and themselves, with their messages enabling improved situational awareness amongst PPDRs and FRs, guaranteed by the gathering of a wide variety of data and information – an activity coined as crisis informatics .

Indeed, several initiatives, mostly private, leverage the real tributes of citizenship and volunteering towards crisis response efforts, whether on web-based crisis management systems, mobile applications for emergencies, location awareness technology in crises, RSS feeds, social networking platforms or web citizenship on security. Web-based systems for crisis, such as Ushahidi and Sahana, contribute to the permanent monitoring of the evolution of crisis events, enabling crowd mapping functions, reports tracking on maps and calendar, alert services and the interaction with multiple sources of information (text messages, Email, tweets, webforms). Also in this field, Google's Crisis Response is a free portal service applied in past crises (e.g., Chile, Haiti and Japan) to enable donations, alerts and infrastructure status reports, as well as satellite imagery and the Google Person Finder, whereas OpenStreetMap provides free worldwide geographical data created by a community of volunteers. These web-based systems started off as project-oriented initiatives and since evolved to accommodate the requirements of several other crises. Other projects remain confined to the specifics of determined events, namely the KatrinaHelp Wiki dedicated to the Katrina hurricane or DigiCel's Mission 4636, launched as a free phone number to meet the urgent needs of the Haitian people (medical care, food, water, security and shelter) through SMS messaging. Even the US Department of Homeland Security (DHS) launched the Haiti Social Media Disaster Monitoring Initiative to assist the Haiti response and recovery effort, creating a situational awareness vehicle able to monitor the publicly available online forums, blogs, websites and message boards to collect critical information.

Web-based crisis systems are also present at official headquarters, within the United Nations (UN) and the European Union (EU), aiming solely to facilitate and support crisis response efforts, for civil protection is a well-recognised national responsibility. Hence, the DG Humanitarian Aid and Civil Protection operates the European Community Mechanism for Civil Protection, comprising the Monitoring and Information Centre (MIC) tool, which provides all participating Member States permanent access to a platform of national civil protection resources, and the Common Emergency and Information System (CECIS) tool, a web-based alert and notification application that facilitates emergency communication among participating states, providing details of required assistance and offered help and making available the status information on emergency developments, through an online

logbook. The Global Disaster Alert and Coordination System (GDACS) is a cooperation framework between the EC and the UN to strengthen worldwide network of crises information providers and users in order to provide reliable and accurate alerts and impact estimations upon major crises and improve the cooperation of international responders in the immediate aftermath of natural, technological and environmental crises.

Addressing ICT tools for crises, it is quite clear the relevance of mobile applications for affected citizens to contact closed ones and authorities, to send and receive text messages or to access platforms like Ushahidi or Google to know and provide critical up-to-date information. Today, mobile technology supports advanced functions for improved user experience, a benefit exploited by applications published by FEMA, the North Dakota State University (NDSU), Ushahidi and the Pacific Disaster Centre , providing citizens useful crisis-related information and upholding built-in bi-directional communication.

Citizens prove to be highly proficuous in launching and contributing to innovative security-related initiatives, such as the portals and websites created by volunteers in the aftermath of major crises to coordinate assistance and help rebuilding efforts, or the 2007 Virginia Tech shooting Wikipedia page composed by 1500 individuals, the wide collection of tweets posted by citizens to assist fire-fighters and citizens during the 2007 Californian wildfires. However, the presented ICT tools, platforms and services require communications to be accessible to those located within affected areas. And after large crises, it is often the case that communications infrastructures are damaged or destroyed. In Haiti and New Orleans the option was to rapidly deploy communications networks via cellular and/or IP-based connectivity (typically WiFi), assisted by satellite links when necessary. Within the iSAR+ Project, also this aspect is well addressed, for two iSAR+ partners, TEKEVER and THALES, have the required expertise to rapidly deploy Mobile Ad-hoc NETworks (MANET), seamlessly integrated with existing communications infrastructures (e.g., cellular base stations, WiFi hotspots or satellite links).

1.3 iSAR+ project

Based on the analysis of the above described reality a consortium of 17 European partners, involving industries, universities and PPDRs, started a reach project funded by European Commission in the scope of the 7th framework program.

The project aimed at research and development of a set of guidelines that, in emergencies or crises, enable citizens using new mobile and online technologies to actively participate in the response effort, through the bi-directional provision, dissemination, sharing and retrieval of information essential for critical PPDR intervention, in search and rescue, and medical assistance. Those guidelines shall among all enable smooth integration of iSAR+ solutions into the current CONOPS of PPDR (e.g. through technological, organisational, ethical and legal and human perspectives). To accomplish this iSAR+ aimed at demonstrating and validating its main concepts by means of technological platform presented to end-users in an

interactive exercise – namely a prototype that was delivered according to a spiral model of system design (i.e. successful iterations).

iSAR+ work was divided into interconnected work packages aiming common project objectives and progressing in three iterations (concept, basic and enhanced). The project work was broken down into five work packages (WP) responsible for the main activities, and two regarding project coordination and disseminations (respectively WP1 and WP7).

Work Package 2 activities had the main role in the project definition phase, analysing scenarios and case studies, defining User Requirements and the project concept, in other words preparing the work to be developed by the so called THEO work packages (Technical, Human, Ethical and Organisational). Once the other work packages start their activities, the work package 2, will act as an integrator of each iSAR+ dimensions' analysis and recommendations, and results, in order to develop iSAR+ guidelines and associated technological platform, to be validated by the means of user showcases (exercises).

Work packages 3-6, the THEO work packages, entail each of the four iSAR+ dimensions, the four pillars on which the project is structured and represent the recognition that these four factors are the key to understanding needs in terms of major crises, especially within the social and mobile media age:

•Organisational: Focused on the analysis of the use of mobile technology and social media by PPDRs (including governmental, NGOs and volunteer organisations), considering the organisations' processes, structures, responsibilities, resources and culture.

•Human: Based on the comprehensive review of evidence and recommendations on the citizens' acceptance and employment of state-of-the-art mobile and social media communication technologies in crises, focusing the human factors' analysis on the efficiency and effectiveness of selected channels and message contents, in full consideration of the human behaviour and cognitive performance in crisis situations.

•Technological: Dedicated to the analysis of ICT systems, social networking platforms and mobile technology employed in crisis situations in order to select the most appropriate tools and identify existing insufficiencies and lack of interoperability.

•Ethical and Legal Framework: Concerned with the ethical and legal framework issues related to the use of social media and mobile technology in crisis situations, namely data privacy, data ownership, technology providers' responsibility and the potential misuse and abuse of ICT tools, a concern that will also be considered during the implementation of all iSAR+ Project activities., focused on the Organisational (PPDRs), Human (Citizens), Technology (platforms for PPDR and Citizens) always taking into consideration all the relevant ethical concerns and the legal framework issues.

1.4 iSAR+ project main challenges and opportunities

Built upon online social and mobile technologies, the new citizen-centric approach evolved from the basic citizens' journalism to raising awareness on the benefits of a bi-directional communication between citizens and officials, with eyewitness accounts, first-hand observations, photos and video directing responders to where they are most needed and guiding citizens away from harm's way, so that better decisions are made and the existing situational awareness gap is closed.

However, despite the global trend on the growing use of mobile technology and social media platforms, visible in worldwide crises' lessons learned, and the empowerment enabled by the new ICT tools dedicated to crisis management and response, FRs and PPDRs remain with an impaired ability to gather, process and distribute information, reinforced by the likely inoperability, overload or destruction of local communication infrastructures. Upon such circumstances, PPDR organisations struggle to develop situational awareness in order to establish priorities, develop a realistic response plan and properly assign resources. Thus, their decisions are often based on partial, limited and incomplete information and, even, intuition. This state of low awareness and high uncertainty ought to be avoided and prevented, so as not to compromise expected performance, concerning the efficiency and effectiveness of crisis response efforts. It is therefore clear that a challenge emerges:

Main challenge: To enable PPDRs and citizens to (rapidly) generate high levels of situational awareness upon the occurrence of a large emergency or crisis event.

Considering current European economic-financial constraints, it is unfeasible to advance solutions that would require significant resource demand or overload, whether personnel and/or equipment to cope with uncertain crisis events, independently of the latter's negative impact. But there are two key factors that, properly exploited, would bring strong benefits to crisis response efforts, without significant added cost: (1) the high level of adoption and use of mobile technology by citizens and (2) the citizen's pro-active behaviour of (online) producing and consuming information in crisis situations. The iSAR+ Consortium understands these factors as an unavoidable main opportunity:

Main opportunity: To exploit the citizens' (i) high-level of adoption and use of mobile technology and (ii) their pro-active behaviour of online information production and consumption.

In crises, citizens are the in situ first sensors. Empowered by the new communication media (mobile phones with cameras, text messaging and internet-based applications connecting to social media platforms), citizens are capable to receive and transmit large quantities of data, capture high-resolution imagery and video, retrieve geo-location information (e.g., GPS and orientation) and run sophisticated applications. Experiencing the urgent crave for information, citizens frequently exchange information with PPDRs and are often confronted with the inoperability of the widely known voice-based emergency number (112 for Europe), caused by its

infrastructure damage, its incapacity to handle large demand or the official unwillingness to provide information continuously. Consequently, citizens found prevailing online social media to be useful tools in crises, allowing information sharing, assistance requests and contacts to loved ones. PPDRs have for years relied in broadcast media and local signs to keep citizens informed; more recently, internet-based services (RSS and Email in near real-time) have been adopted but most PPDRs still remain disconnected from online and social media platforms.

1.5 Hurdles to the Use of New Communication/Social Media in Crisis Situations

Indeed, FRs and PPDR organisations, and their traditional command and control models, do not easily adapt to the new crises' trend of including a global, digitally enabled social arena. PPDRs have centralised governance, with clearly defined roles and well-established processes. A lack of trust between officials and the public is a significant obstacle to overcome when it is required to create bonds and establish the necessary confidence to act on the basis of another's words, actions and decisions.

Barrier: PPDRs distrust online social media as a credible information source and a viable communication tool with citizens in crises.

Apart from Bach and Kaufman's mistrust, there are also control, ownership, privacy and security issues, but also information overload, accuracy, verification and (source and content) validation problems, concerns with the responsibility or accountability of ICT providers and the possibility of citizens' overzealous behaviour.

On another token, it is legitimate the fear of commercial exploitation of private data, the use of misinformation as a weapon and, even, of political and ethnical pursuit, once people's location information becomes part of the public sphere. Overall, it is comprehensible that the absence of a thorough ethical and legal framework to address the issues raised by the use of social media in crisis response efforts also contributes to the PPDRs' general scepticism towards the integration of new social media as an additional public communication tool.

Barrier: Popular online social media platforms cannot be used as a formal PPDR tool for they do not uphold EU ethical principles and legal framework.

Likewise, the long-time established PPDR organisational culture and tradition will probably act as an additional obstacle to change, especially considering that the integration of social media in PPDR processes will certainly provoke a significant impact on existing structures, roles, functions, procedures, information workflows and technology, as well as add a new risk into a critical activity that serves, protects and saves lives. The absence of superior endorsement, sometimes prompted by unfamiliarity, and the lack of expertise, resources and budget are major hurdles to consider in the analysis, especially at a time when public safety budgets shrink and fewer resources have to address greater needs. Although the impact

of not adhering to the new mobile and social communication media is unlikely to be considered, the impact of the integration of social media in crisis response efforts is certainly reduced if the proposed change is a process carefully structured, managed and tested, before implementation.

Barrier: Introducing change to PPDRs entails new risks and it is a process to be carefully structured, managed and tested, before implementation.

Old habits are difficult to change and they are not exclusive to PPDR organisations. Also citizens have recurrent loyalty behaviour towards specific social media networking and, in face of a new PPDR social media platform, there could be some difficulty to rapidly aggregate a significant number of followers. Undoubtedly, to have a PPDR social media platform segregated from the online circles widely adopted by the public, such as Facebook or Twitter, would be a high-risk enterprise.

Barrier: Citizens use the online platforms they are accustomed to. Forcing a change of habits and the adoption of an unfamiliar platform will likely result in failure.

It was the iSAR+ Consortium's ultimate goal to successfully explore today's identified opportunity to surpass the presented challenge, acknowledging the seriousness of current barriers to the exploration of new mobile and social communication media as a means for citizens to contribute efficiently and effectively to public security in crisis situations.

The main results of the ISAR+ project are summarized in the following chapters of this book.

2 Live Exercises

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Abstract

BACKGROUND: Live exercises were the chosen approach for validation of the outcomes of the iSAR+ project. During the project's course three exercises were organized in the end-users' (citizens and PPDRs) environment with participation of the iSAR+ end-user community.

OBJECTIVE: The live exercises [user showcases] conducted within the task 2.6 of the project were utilized in collecting feedback, recommendations and lessons learned resulting from the end-users experience with the iSAR+ prototype in order to ensure that iSAR+ would meet the needs of the end-user community and to validate the iSAR+ prototypes, concept and platform.

RESULTS: Through the live exercises citizens and PPDRs were able to utilize iSAR+ tools in realistic environments. Their experiences were discussed and opinions, comments and suggestions exchanged after the exercises in order to further develop the project concept, platform and recommendations. Live exercises enabled active participation of the end-users into the research and development process. Live exercises offered useful opportunities for dissemination of the project. They also contributed to the work performed within the other work packages of the project.

2.1 Live Exercises as advanced validation

Live exercises, carried out in the end-users' (citizens and PPDRs) environment, were the chosen approach for advanced validation of the iSAR+ prototypes, concept and platform. Performed in synchronization with the project's official iterations, three exercises were organized, each with an active participation in the iSAR+ end-users community. The live exercises were utilized in collecting rich feedback, recommendations and lessons learned resulting from the end-users' (PPDRs and citizens) experience with the iSAR+ Prototype.

The main objectives of the live exercises were:

- to validate the requirements for the iSAR+ platform and its functionalities;
- to demonstrate the iSAR+ platform and capabilities, focusing on the use of new media in crisis management;
- to extract comments and collect feedback from the end-users' community participating in the exercise and to use this information to derive recommendations and further development of the iSAR+ tools;
- to collect suggestions for the preparation of the next live exercises.

The live exercises organized along the project were also a part of the dissemination of the iSAR+ project.

Three exercises were organized for the presentation of iSAR+ capabilities and benefits to end-users by recreating a fictional scenario and presenting iSAR+ functions. The first live exercise was performed with the iSAR+ Concept Prototype in Portugal involving Portuguese end-users (PPDRs). The second live exercise was conducted with the iSAR+ Basic Prototype in France involving French end-users (PPDRs and citizens). The third one was organized with the iSAR+ Enhanced Prototype in Finland involving Finnish end-users (PPDRs and citizens).

As the second and third exercises required individuals' use of the iSAR+ prototypes and the gathering of personal data, National Data Protection Authority's (DPA) approval for the respective live exercise was requested. This was pursued in order to mitigate all potential risks related to data protection and privacy. Before each exercise the participants signed an Informed Consent expressing that they freely agreed to take part in the live exercise after being informed about its purpose, risks and related issues. They were also informed that they have the right to withdraw from the exercise at any time.

The outcomes of each exercise were discussed in a workshop performed in the day after to promote dialogue between iSAR+ observers and the involved end-users. The results of these workshops were used to refine user requirements and the iSAR+ project roadmap, and to effectively contribute to the work performed within each THEO dimension of the project.

The live exercises conducted are reported in project deliverables D2.6.1 “iSAR+ Concept Prototype User Showcase (Plan and Results)”; D2.6.3 “iSAR+ Basic Prototype User Showcase (Plan and Results)” and D2.6.5 “iSAR+ Enhanced Prototype User Showcase (Plan and Results)”. The related workshops are reported in D7.3.1 “iSAR+ Workshops (Organisation and Results)”. These documents can be found at http://isar.i112.eu/deliverables/index.html.

2.2 Live Exercise in Portugal

The first live exercise took place in Cascais, Portugal on October 9th, 2013, in the facilities of Cascais Civil Protection, located in the city of Alcabideche, Portugal.

This live exercise consisted of a command post exercise to demonstrate and use the concepts defined during the first iteration of iSAR+ project. The exercise was thus expected to elicit end-users’ needs and retrieve further feedback in order to consolidate existing ones and/or identify new requirements. The live exercise was then focused on the collection of inputs, comments or recommendations, on the usage of iSAR+ platform aiming the validation of the concept developed in the scope of the first iteration of this project – the Concept Iteration.

Elements to monitor during the exercise were e.g. PPDR procedures for taking advantage of the information provided by the citizens through the social media channels and to validate the information received from citizens and social media (eliminate rumours, duplication, etc.).

Scenario

The participants followed a story-line devised by the members of the iSAR+ consortium. The story-line portrayed a fictitious scenario of a disaster that took place at the fictitious “iSAR+ Hotel” in the city of Alcabideche:

The America’s Cup yacht race will leave the harbours of Cascais for another edition of the planet’s oldest international sports competition. The city is crowded with sailing fans from all over the world. In the meantime in downtown Cascais, maintenance work is being undertaken in the city’s gas distribution system. Several citizens report to the emergency services a very strong gas scent and the civil protection agents decide to further investigate the problem. A few minutes after the inspector arrives at the site, a huge explosion occurs in one of the most popular hotels in Cascais located just 100m from the location where the gas scent reports have been initially registered. The hotel is now on fire and a series of subsequent explosions occur; one of these explosions affects a near-by restaurant. The emergency team starts rescuing and evacuating victims from the area. Chaos is established and the area is unsecured, having people plundering business and commercial buildings. People have disappeared when trying to get out of the area. Local embassies request information on possible citizens from its country involved in the accident.

Scenario actors

- The Civilian Protection Municipal Services (CPMS) – a team of experts that coordinate all the event response activities. The team experts are also capable of assessing the event at the site.
- The Rescue Operations Command (ROC) – Command and Control outpost established at the theatre of operations where operations of the first responders are locally coordinated and first aid assistance is provided to citizens.
- The First Responders (FR) – the emergency first responders provide assistance to the citizens in the case of an emergency, including the police.

A fourth type of actor, the citizens and media, didn't have a direct role in the scenario although their presence was simulated by the generation of data performed by project members.

During the live exercise there were incoming messages received by radio and through the iSAR+ platform. End-users were able to upload messages onto the platform and to target those messages to a specific audience (e.g. PPDR, citizens). The purpose of such messages was to provide updated information concerning the fictitious disaster, or to communicate with the different end-users representing the PPDR agencies and to give instructions to the citizens. Social media posts were not actually published online.

Figure 2-1 The Ops Room of the CPX exercise, with PPDRs and iSAR+ partners (as observers)

All the actors were located in three physical places (exercise areas) of Cascais' Civilian Protection facilities:

- Communication Room (central), where all the information was received and validated before dissemination to the decision makers;
- Operations Room with all the main decision makers, either from the Civilian Protection services, from the Police Department or from any other emergency entity;
- Operational Vehicle simulating the Rescue Operations Command and with all the entities typically located at the Theatre of Operations, like the First Responders.

Figure 2-2 A briefing to iSAR+ partner (observers of the PT Showcase)

The most important actions were performed by the PPDR members, under the observation of other iSAR+ consortium partners. As the exercise was performed in Portuguese language, observers were supported with non-professional translation services.

Results

At the end of the exercise PPDRs were convinced that they could take advantage of such tools in the management of crisis situations. They provided interesting suggestions contributing not only to improve the iSAR+ platform but also to define the needed guidelines on how to implement such tools, how to train and prepare the PPDRs to, for example, react to new kind of inputs only available through the use of this kind of platform, like data coming from the citizens.

For the iSAR+ partners, the discussion with end users gave an opportunity to gather directly from the operationals` inputs which contributed to the definition

of work to be performed within the other work packages, and also for the preparation of the next live exercises based on suggestions collected here and the lessons learned by all the exercise stakeholders.

The commitment and interest of all participants was crucial to the success of this exercise. At the end it was possible to build a deeper insight of what iSAR+ guidelines and platforms can be in the near future and how PPDRs entities shall organize to face a new reality of crisis management policies, tools and processes. The iSAR+ Concept Prototype was stated as validated.

2.3 Live exercise in France

The French live exercise took place during the evening of September 24th in Paris, both in Paris fire brigades operational centre (Champerret) and Montparnasse train/metro station (Montparnasse), which is a big public transport hub.

The elements monitored during the exercise were, among others, the adherence of citizens to the use of social media channels during a crisis situation and the type of information provided by the citizens to the PPDRs via social media channels. Citizens' reactions with regards to information received from PPDRs during crisis situations were also of interest during this exercise. Procedures to validate the information received from citizens and social media (eliminate rumours, duplication, etc.) were also studied.

Scenario

The live exercise scenario comprised 2 phases:

First, citizens report to the authorities an unattended luggage in the train station close to the platforms. SNCF (Société Nationale des Chemins de Fer Français, French National Railway Company) agents decide to investigate and find the luggage. Meanwhile a terrorist attack rumor appears on Twitter. Authorities send a message to the citizens in the train station area about the unattended luggage and ask the owner to make himself known. The owner sees the message and goes to the security agents to get his luggage back. Authorities inform the population about the falseness of the rumour.

Right after this first event's closure, an alarm is raised from the metro area, signaling a smoke emission which starts the 2nd phase of the scenario. Citizens send a number of messages on twitter about a fire spreading in the corridor. Others tweet about their respiratory problems due to smoke ingestion. Authorities send fire brigades to intervene. They inform population around the train station and especially around the close-by Montparnasse tower not to go in the train station. In the meantime, authorities inform the citizens inside the train station to regroup at a specific place where they will get assistance from emergency services.

Scenario actors

Typically all operations concerning a major crisis occurring in a hub like Montparnasse is centrally coordinated by the Paris Zone de Défense et de Sécurité which is under the authority of the Paris Prefect. For such a crisis, they would work in close cooperation with the Paris fire brigades (BSPP - Brigade des Sapeurs Pompiers de Paris), the SNCF (French railways) and the RATP (Paris underground, bus and Tramway company).

Consequently, the FR live exercise scenario required the participation of these four main actors with a fifth type of actor, the citizens, played by Red Cross volunteers and students from the Sorbonne University (around 50 citizens altogether).

During the French live exercise the basic prototype was tested. At this stage of the project, the platform was already entirely integrated and it was possible to see the social networks information being gathered and brought to the platform and all the alerts generated based on that information being broadcasted to the field, either to PPDRs or citizens. It was also possible to check what could be done in terms of information geolocation without latitude and longitude coordinates.

During the live exercise the use of 4 components of the iSAR+ platform was demonstrated:

- Collaborative crisis coordination platform to collect, validate and disseminate information (IPS).
- Geographically targeted alerting towards citizens (myPublicAlert - mPA).
- Social media monitoring (SMM-OsintLab).
- Translation and geolocation of tweets (TAT2).

The citizen players were asked to use social media (Twitter for the FR live exercise) and one of the tools developed through iSAR+ (Permiloc application) during the course of the crisis. To ensure data privacy and not create a panic on social media, it was decided to create a private network on Twitter, only visible by participants of the live exercise (specific accounts were created for all the "citizens").

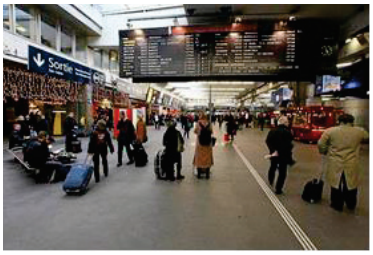

Figure 2-3 Montparnasse train Station

Figure 2-4 BSPP Operational

iSAR+ complete platform was in Champerret and a mobile platform (IPS mobile) was used in Montparnasse. As the event occurred during opening hours of the station, it required specific attention from the players, not to create panic among real travelers. Players were asked not to run or shout and they had to wear a distinctive sign (ribbon around their arm).

Permiloc and mPA were used to disseminate information and alerts coming from PPDRs, based on the Citizens location. Also SMM was able to crawl through Twitter using the geolocation information coming with the Tweets.

The live exercise started at 22:00 with a briefing conducted in Champerret by the iSAR+ French partners, explaining the players and observers what were the main objectives of the exercise, appealing to the critical spirit in relation to the project guidelines as well as regarding the usage of the iSAR+ platform and the way it was designed. The exercise was performed using French language with French partners providing a non-professional translation support when necessary.

Figure 2-5 Citizens players in Montparnasse

The exercise took around one hour. At the end of the live exercise, PPDRs were interviewed by iSAR+ partners to collect their feedbacks on the tools, and citizens filled in questionnaires.

Results

PPDRs were convinced that they can take advantage of this kind of tools in the management of crisis situations to give instructions to population on a large scale and also detect interesting information from citizens affected by the crisis. They expressed their feeling that operational processes are well in place and not easy to change; thus, iSAR+ tools would have to fit in the existing processes which requires a close work with PPDRs.

The PPDRs considered that as the tools are quite powerful to communicate very rapidly with a large number of citizens, they have to be used with care not to generate panic. Guidelines for using social media and mobile technology in emergency management are very important on this matter.

The citizens gave very productive comments and ideas on the way they could interact with PPDRs during a crisis, how the tools could be of help and what they would expect from the PPDRs. They pointed out that important information coming from PPDRs should be seen at once among all rubbish or less urgent information.

Decisions were taken to improve the prototype, mainly some changes of the interfaces in order to present the information in a better way and add some functionalities to have a more efficient event validation process. At the end of the French live exercise, the basic prototype was considered validated and the next phase (enhanced prototype) could start.