COBACORE Report Summary

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Final Report Summary - COBACORE (Community Based Comprehensive Recovery)

Executive Summary:
The Community Based Comprehensive Recovery (COBACORE) project aims to support common needs assessment and recovery planning efforts in complex multi-sectorial, multi-stakeholder crisis environments by building upon the community as an important source of information and capabilities. The COBACORE project aims to help bridge so-called collaboration gaps: failure of collaboration caused by insufficient information sharing among partners, incompatible work practices and misaligned decision making processes. In the field of disaster recovery, this collaboration gap is ubiquitous and detrimental to the efficiency of many recent relief efforts. Closing this gap is the key to reduce the time needed for needs assessment, better needs monitoring, and planning.

Our prime instrument to close these gaps the COBACORE platform: a collaborative platform that facilitates the interaction between members of the professional, affected and responding communities in disaster recovery. The COBACORE platform shows how smart technology can help close collaboration gaps between communities. It connects those in need with those who can help, and activates capacities throughout society. Additionally, the platform provides professionals with a deeper insight into civilian recovery activities than normally available, which helps to deploy resources more efficiently, and provide guidance to spontaneous citizen volunteers. The COBACORE platform emphasizes that disaster recovery is a community-wide responsibility where information is shared freely and coordination of actions is a joint responsibility.

Throughout the project, the team has worked closely with potential users to develop valuable platform features. There have been development workshops in Berlin (DE), Sevilla (SP), Belfast (UK), Dublin (IE), Zilina (SK) and larger evaluation sessions in Rotterdam (NL) and Ahrweiler (DE), with each iteration presenting a more mature concept and platform to stakeholders. At the final evaluation session, participants exhibited an overwhelming appreciation of the evaluation setup, the COBACORE concept and the platform. They confirmed that the COBACORE concept of community-based disaster recovery is effective and valuable and that the COBACORE platform is a valuable instrument to foster community interaction.

In addition to the core material and technology, the consortium produced materials that can be used for further concept development. This includes a guideline for local implementation that takes local characteristics into account to create a fitting instantiation of the COBACORE collaboration concept and platform. Other results, such as the the COBAGame method, the ‘community liaison team’ training and the wide set of platform features, make for a comprehensive starting point of innovation in the domain of disaster recovery.

Project Context and Objectives:
Our living environment is becoming more and more complex. Through urbanisation, digitalisation and globalisation, urban communities are becoming more and more dependent on infrastructures, digital systems and government facilities. These developments impact our disaster resilience: the capacity of communities to withstand the effects of a disaster, or recover rapidly. When disaster strikes in an urban environment, it disrupts many social, infrastructural and economic systems, and that makes it hard to bounce back quickly. Due to climate change, economic and societal shifts across the globe, we will see more
frequent and more significant disasters than ever before, and effective recovery mechanisms will become crucial. In general, there is a global awareness that we need to invest in new and innovative ways to reduce risk and improve recovery capacity.

Over the past decade, there have been many natural, industrial and social disasters in well-developed urban areas with pronounced and long-lasting effects. Cities such as New Orleans, L'Aquila and Christchurch continue to endure the impacts of disaster, be it environmentally, socially, economically or emotionally. Disaster recovery is a complex process that takes place over a long period of time with many factors, actors, considerations and conditions at play. Rebuilding a disaster-affected area into a self-sustaining state is a daunting task for all involved, and requires a high degree of collaboration to succeed. All too often, collaboration among critical partners goes awry, leading to misalignments between recovery efforts and community needs as well as unnecessarily protracted recovery timelines.

In our exploration of the disaster recovery and reconstruction domain, we have concluded that ‘collaboration gaps’ between mission-critical parties hinder the effectiveness and efficiency of the recovery and reconstruction process. The word ‘gap’ refers to the discrepancy to the ideal and the actual level of efficiency. Plainly put: parties do not interact as well as they should. These gaps can be attributed to a range of factors including; poor coordination of activities, a lack of understanding of each other’s needs, flawed information distribution, lack of knowledge, conflicting beliefs or work practices. This is not a new insight: disasters put societies under stress, and under stress, things go wrong – at all levels, and between levels. There are typically collaboration gaps between parties at the field and strategic level. Governments, donors and upper level parties usually don’t have the capacities or ‘hands-on’ experience to fully grasp understand the situation at ground level. Conversely, people in the affected area typically don’t understand the dynamics of governance and funding. Moreover, since recovery is a lengthy process, the parties active at the start will not be the same as those active at the end. Often information gets lost because of changing actors, and carefully crafted collaboration agreements prove hard to maintain over time. Such phenomena frustrate recovery and lead to scenes that we see all too often: communities that struggle to recover long after the initial disaster has struck. Even with a surplus of money, capacities and societal support, it seems hard to efficiently remedy all the damage that a large scale disaster does to an urban environment. There is seldom a shortage of people that care and want to contribute, but it is difficult to properly match offers and needs, especially with diverse views of what a ‘need’ actually is.

We feel that the core cause of such inefficiencies lies in persistent collaboration gaps between the major groups in disaster recovery. The COBACORE project (Community-Based Comprehensive Recovery) aims to help close collaboration gaps between communities in disaster recovery, and contribute to a solid disaster recovery fundament.

We distinguish between three main communities: the professional community, the affected community and the responding community. The affected community are people and groups that are directly and indirectly adversely affected by a crisis or disaster, and are in need of support. The responding community consists of local or outside community members that support the recovery process but are not trained in crisis response. This community includes spontaneous volunteers, established community groups and other willing and able individuals that ‘stand-up’ in times of crisis. The professional community comprises parties that partake in the disaster recovery in a professional capacity and includes civil support organisations, and city government teams.

Based on our analysis of recent natural and technological disasters, we found that there exist three main collaboration issues between these groups:

• problematic information exchange between the professional community and the affected community,
• significant collaboration and coordination issues between the professional community and the responding community
• inefficiencies in needs and capacity matching between the affected and responding communities.

These three observations form our core focal points: the three most significant examples of collaboration gaps between key communities that need to be addressed, and thus form the core objectives of the COBACORE project. By helping close these
gaps, the project contributes to a more connected, collaborating society that has the propensity to recover faster from disaster.

Our prime instrument to close these gaps the COBACORE platform: a collaborative platform that facilitates the interaction between members of the professional, affected and responding communities in disaster recovery. The COBACORE platform shows how smart technology can help close collaboration gaps between communities. It connects those in need with those who can help, and activates capacities throughout society. Additionally, the platform provides professionals with a deeper insight into civilian recovery activities than normally available, which helps to deploy resources more efficiently, and provide guidance to spontaneous citizen volunteers. The COBACORE platform emphasizes that disaster recovery is a community-wide responsibility where information is shared freely and coordination of actions is a joint responsibility.

Based on this background, the COBACORE project has worked towards three main objectives:

• Develop a vision on how communities can work together to recover faster from disaster
• Build a demonstration platform that shows how current technologies can make that happen
• Create a network of supporters that can adopt the COBACORE outcomes and bring it into practice

These three objectives have been successfully fulfilled throughout the project. The many project results and many exploitation activities ensure that the project will contribute to innovation in the field of disaster recovery, and beyond.

Project Results:
The COBACORE project: Closing collaboration gaps in Disaster Recovery
Building on stakeholders’ demands and challenges, the COBACORE project built a myriad of results, much more than just the technology platform. The project team has laced the central collaboration platform with organisational processes, training materials, insights and use concepts that hold valuable potential for exploitation for each project partners. We will briefly discuss the major results, and reference corresponding deliverables and project activities.

The COBACORE concept
The COBACORE project starts from five fundamental assumptions. We believe (1) that disaster recovery needs to be viewed as a society-wide responsibility. Disaster recovery may not be regarded as the sole responsibility of professionals – or citizens for that matter. Every stakeholder in a society needs to play their part and contribute, and this notion needs to be deeply embedded in a societies’ disaster management repertoire. From this notion, we infer that (2) communities need to be connected – in terms of mutual awareness, trust, information, and appreciation. Societies exist by virtue of connected communities, and in disaster recovery that connectedness is a crucial asset. Thirdly, (3) information needs to be shared broadly, but suitably. Communities need relevant and trustworthy information to act efficiently and timely, and it is a common responsibility to make that happen. Additionally, there needs to be (4) a widespread agreement on the need to empower communities wherever possible. Professionals can empower citizen communities with guidance, instructions and materials. Citizen communities can empower each other by joining, sharing and inspiring, and can empower professionals by providing actionable information. And, above all, there needs to be willingness to (5) co-create and co-learn. No single situation is the same, so it is crucial that societies create an atmosphere where joint learning, joint creation and joint actions are the default, not the exception.

These five assumptions form the foundation upon which the COBACORE project was built.

The COBACORE project aims to help close collaboration gaps between communities in disaster recovery. We distinguish between three main communities: the responding professionals, the affected community and the responding community. The affected community are people and groups that are directly and indirectly adversely affected by a crisis or disaster, and are in need of support. The responding community consists of local or outside community members that support the recovery process but are not trained in crisis response. This community includes spontaneous volunteers, established community groups and other willing and able individuals and organisations that ‘stand-up’ in times of crisis. The responding professionals
community is comprised parties that partake in the disaster recovery in a professional capacity and includes civil support organisations, and city government teams.

It is important to realise that people can be part of multiple communities. Someone affected by a disaster can still offer help and thus be part of the responding community. A local firefighter might be formally part of the responding professionals, but in his private environment suffer from the effects of a disaster, and be part of the affected community. Also, at the intersections of the key communities, there are interesting cross-cutting groups, such as the trained volunteers and the affected professionals.

Based on our analysis of recent natural and industrial disasters, we found that there exist three main collaboration issues between these groups:
1. Problematic information exchange between the responding professionals and the affected community
2. Significant collaboration and coordination issues between the responding professionals and the responding community and
3. Inefficiencies in needs and capacity matching between the affected and responding communities.

These three observations form our COBACORE issues: the three most significant examples of collaboration gaps between the key communities.

So, here begins the innovation path of COBACORE: to close the collaboration gaps between our three key communities. Closing these gaps will help build a more connected, collaborating society that has the propensity to recover faster from disaster. Deliverables D1.1 (Scope and requirements for the COBACORE tool), D1.2 (State-of-art, trends and opportunities in damage and needs assessments in post-disaster environments) discuss the project context in more detail.

The COBACORE collaborative platform
Technology alone can never solve such large ambitions, but it can be a tremendous catalyst to encourage change. We see the community members in or near the affected area as the most important actors in relief and recovery. In its Network Age report, UN OCHA reports a fundamental shift in power from capitals and headquarters to affected people. New tools appear that engage broader social networks, communities and individuals in disaster relief, are that are more effective in helping people help themselves by mobilizing local, national and sometimes global support to meet their needs.

Our prime instrument of change is the COBACORE platform: an online collaborative platform that facilitates the interaction between members of the professional, affected and responding communities in disaster recovery. The COBACORE platform is an illustration of how smart technology can help close collaboration gaps between communities. We position the COBACORE platform as the central mediating platform between communities. In its most progressive form, the platform would be the sole mediating platform during disaster recovery – the place where information comes together. In practice, the platform might be interlinked with other platforms, or perhaps might not be visible at all for some groups if they connect through an intermediate person or organisation.

The COBACORE platform aims to connect those in need with those who can help, and help activate capacities throughout society. Additionally, the platform provides professionals with a deeper insight into civilian recovery activities than is normally available, which in turn helps to deploy resources more efficiently, and provide guidance to spontaneous citizen volunteers. The COBACORE platform emphasizes that disaster recovery is a community-wide responsibility where information is shared freely and coordination of actions is a joint responsibility.

The COBACORE platform is built with flexibility in mind – in terms of inter-linkages with other information sources and platforms, in terms of available specialised features and in terms of user interface. Users can choose to use a web-based version of the platform, or use a mobile application. Both versions provide similar functions to users and draw on the same cloud-based information source. Additionally, the platform offers a different interface to each of the key communities. For members of the affected and responding community, the focus of the interface lies in registering needs and capacities, and
making matches. For professional users the interface helps to build up situation awareness and brings extensive information management options. Additionally, there are specialised interface versions for community liaison team members and field officers, centered on information verification and establishing communication with community members. More information about the platform design and technology can be found in the deliverables of WP3 (Concept development and support mechanisms) and WP4 (Platform and Interfaces).

The Information Framework and Semantic Architecture
An important part of the foundation for the platform is the COBACORE data and information framework. The COBACORE information framework has been conceived as a technical solution to facilitate more efficient and effective real-time matching of ‘needs’ and ‘capacities’ across affected communities leading to the generation of ‘activities’ which contribute to the reconstruction and recovery efforts. The added value proposition of the COBACORE data framework is two-fold. The ‘real time’ platform serves as a timely, robust and credible evidence base to improve situational awareness and inform decision making (particularly amongst professional responders). However, the most pertinent value proposition is the identification of ‘capacities’ and the generation of ‘activities’. These attributes serve as ‘enablers’ to more effective coordination and deployment of volunteers – hence forth a significantly underutilised recourse within the confines of the disaster recovery and reconstruction process.

The Need-Capacity matching algorithm underlying the COBACORE data framework has been conceived to facilitate the task of identifying potentially relevant capacities in response to a target need across communities. When a Need/Capacity is registered on the platform, its descriptions are automatically analysed in order to tag them as belonging to one (or sometimes multiple) specific categories within the given Category hierarchy. Feature Matching is then applied using a multi-criteria decision making approach predicated on the 4W (Who, What, Where, When) approach. Additionally, a dedicated dictionary was integrated within the platform in order to permit the generation of additional synonyms for all stemmed words, including Category and Type values, contained within the expanded description of a Need or Capacity. The ‘NHunspell Library’ was used and its thesaurus functionality employed to produce sets of synonyms that were subsequently concatenated to the expanded description prior to matching. Further reading can be done in D2.2 (Definition of modelling hierarchy) and D2.3 (Development of data framework).

COBACORE frames
The COBACORE platform is a versatile environment, and caters to different key communities with distinct functionalities. Throughout the project, we have built up five major ‘frames of use’ that collectively address our core functions. These frames characterise a typical use of the platform and helped to steer the development of specific user features.

- The marketplace. A central goal of the COBACORE platform is to connect community members in need with those who can provide a matching product or service. The platform serves as a place to exchange goods and services and to get a better overview of what is going on in a recovering environment. Since needs and offers may vary wildly in type, users are guided in the registration process. This ensures that needs and offers are properly stored, and good matches can be made. For affected and responding community alike, the platform offers smart searching, matching and linking options so that users quickly find what they search for. Content is placed on a versatile map that gives a comprehensive overview of needs and offers in the affected area.
- Information and Insight. For professional users, the platform provides novel insights into the disaster recovery process. As community members register their needs, offers and activities, it becomes clearer for professionals to understand where their professional help is needed most. Professional users also have access to analytical graphs that give a detailed breakdown of the types of registered needs and capacities, with further options to monitor progress over time. Furthermore, professional users have dedicated annotation tools to place markers on the map, and enable specialised overlays. In summary, the platform provides professional users with an indispensable asset to make better informed decisions.
- The community champion. Community champions are individuals that mobilise their community members. They initiate activities and bring people together. The platform helps community champions by making it easy to organise activities and
inviting parties to join. The activity organiser can set tasks, communicate with activity partners and link offers and requests that have been posted to the platform.

- Community Liaison Team. A smart way to bridge the gap between professionals and citizens is to make use of a liaison team: a team of professionals and volunteers that relay support information exchange between professionals and civilian communities, and ensure information validity. The COBACORE platform has dedicated features to support a liaison team such as quick-communication channels, information verification options and a dedicated interface for on-field liaison team members.

- Learning environment. Practice makes perfect, but in the absence of large-scale disasters, it is not easy to learn how to collaborate in a disaster recovery setting. The COBACORE platform is a versatile environment that can also be used for learning purposes. The platform is easily configurable, and has various moderation and logging features that make it suitable as the center piece of a learning environment. During the project, the platform has been used extensively for evaluation purposes in so-called COBAgames and to great appreciation by participants.

The platform holds specific functions for each frame of use. Features are introduced in D3.1 (Mock-ups of interface of COBACORE workspace and functional behaviour of COBACORE) and D3.2 (Report on interface components of COBACORE workspace and functional behaviour of the COBACORE system), with their technical implementation aspects described in D4.3 (Final platform implementation report).

The COBAgame method
Disasters occur rarely, thankfully. However, this limits options to create, develop and test in practice. Therefore, we have built the COBAgame method: a serious game that builds upon the COBACORE platform and puts participants in a post-crisis scenario. Players are given role profiles and become part of the professional, affected or responding community. The COBAgame is designed around the needs posed by the affected community which can be addressed by ‘undertaking’ an action in that neighbourhood. For each action various resources are required, which will, over the course of the game, be harder to come by. In order to provide the affected community with suitable relief, all communities will have to pool their resources and jointly determine what actions are to be taken where. This requires the players to assess what the needs are, establish what actions can be undertaken and who has the resources to make that happen. Most importantly, it requires the players to look beyond their own capabilities and establish collaborations rather than only undertake actions that they are able to carry out on their own. This aligns closely with the process that COBACORE aims to facilitate.

The COBACORE platform plays an important role in the COBAgame method, as it provides a realistic information exchange environment to participants, but also logs activities and communication for post-game performance assessment. The COBAgame method has been used in the Intermediate Evaluation (D5.2 Evaluation report on the intermediate evaluation) and the Intermediate Evaluation 2 and Final Evaluation (D5.3 Evaluation report on the second intermediate and final evaluation). Furthermore, the COBAgame method is being introduced to various external parties in an effort to develop volunteer management training programs for the Red Cross (see D6.2 Report on exploitation opportunities and sustained development for the COBACORE platform).

The COBACORE Evaluation Sessions
There is an interesting commonality among popular social technologies: users tend to create their own way of working – sometimes widely different from what the creators originally aimed for. The COBACORE platform is no different: it serves many types of users, many types of needs, and offers a high degree of freedom to users. This makes platform development and evaluation a rather complicated task. The COBACORE project has made extensive use of stakeholder interaction to validate its assumptions and assess the value of its tools for stakeholder communities. Through many interaction sessions across different parts of Europe, we have gained a thorough understanding of typical local issues that arise during disaster recovery, and learned about relevant local community interactions. For many of our stakeholders, true community-driven disaster recovery is a ‘game changer’.
There is widespread agreement that citizen communities and volunteers need to play a far greater role in disaster recovery, and that there is a significant potential to improve the efficiency and effectiveness of both short and long-term recovery operations. However, the challenge is how to best harness or leverage this potential. For example, how do we connect to people who are by definition not (formally) organised? How do we direct their efforts to where their help is needed most? How do we integrate and link formal response with their resources and skills? In trying to answer these questions, the COBACORE team has conducted a series of evaluation activities including stakeholder discussions and evaluation sessions, case-study analysis and best-practice research, which have highlighted the need to develop a central collaboration system to facilitate and optimise community-based recovery. There have been development workshops in Berlin (DE), Sevilla (SP), Belfast (UK), Dublin (IE), Zilina (SK) and larger evaluation sessions in Rotterdam (NL) and Ahrweiler (DE), with each iteration presenting a more mature concept and platform to stakeholders.

The COBACORE project’s final evaluation took place at the Akademie für Krisenmanagement, Notfallplanung und Zivilschutz (AKNZ), in Ahrweiler, Germany. The exercise was the last in a series of platform evaluation sessions, and demonstrated the platform in its final state. For two days, more than 60 professionals and trained volunteers submerged themselves in an elaborate COBAgame setting, and experienced the difficulties of collaborating in disaster recovery. The scenario depicted the aftermath of an earthquake in the German town of Brüggen, close to the Dutch city of Roermond. The earthquake caused substantial damage on either side of the border, and three weeks after the event, both cities are still very much in distress. The exercise was run with both Dutch and German professionals and volunteers, and many played in their real-life role such as the Mayor of the city of Brüggen and his crisis-team, and representatives from the Dutch cities of Roermond and Veghel. Furthermore, many trained volunteers participated in the game as affected or responding community members. Both German and Dutch professional teams made use of a ‘community liaison team’: a team of volunteers that helped connect citizen communities to professionals and provide on-field support to citizens.

As with all COBAgame (see below) sessions, participants were given a role profile and specific tasks to solve. For example, participants needed to tend to a castle whose walls were crumbling, or deal with the disruptive effects of a blocked road, or even work together to locate a venomous snake that had escaped from the zoo. Some tasks could be dealt with by simply finding someone with the most suitable resources (e.g. a vehicle, or a pair of capable hands), but in many cases, the task required that many parties came together and make something happen. Even though many of the roles and tasks were rather frivolous, participants were quickly drawn into the scenario and actually experienced the chaos and disorder that is typical of disaster recovery.

After two days of play, there was an overwhelming appreciation of the setup, the COBACORE concept and the platform. The key appreciations:

• A clear confirmation that the COBACORE concept of community-based disaster recovery is effective and valuable.
• The COBACORE platform is a valuable instrument to foster community interaction
• The ‘community liaison team’ concept and the COBACORE platform have proven to be easily adoptable in existing procedures and arrangements
• The COBAgame setup is an excellent way to experience alternative approaches to disaster recovery, and a great way to become familiar with the COBACORE platform.

Participants all felt the COBACORE could work in a ‘real world’ situation subject to some enhancements which the COBACORE development team have been considering implementing in the final release of the platform. Detailed results from the Final Evaluation are captured in D5.3 (Evaluation report on the final evaluation).

COBACORE guideline for local implementation
There is no “one size fits all” COBACORE implementation. The "COBACORE guideline for local implementation" is a method to obtain, based on the COBACORE concept, a local implementation that takes into account the existing local organisational framework, the prevailing regulations, the culture, etc. The key elements are a selection of features and
procedures/processes, followed by some tweaking for an optimal fit. The main exploitation area for the guideline for local implementation is by government and NGOs that need to adapt the generic COBACORE concept/system to their local needs. D6.7 (Results from the adoption workshops in the Dutch national safety domain) and D6.8 (Guidelines for national implementation of the COBACORE platform) introduce the guidelines, and show the reception by Dutch Safety Region representatives.

Per Workpackage Results:

WP1 Domain analysis, scope and requirements
The main contribution of WP1 to the project is the identification of new opportunities that social media and other technological innovations bring to professionals and responding organisations. These new opportunities are mainly related to the capacities that responding communities (can) bring to an affected community. Improved communication options (can) enable affected communities to express their needs, allow spontaneous volunteers to organise themselves and respond to those needs. This would allow for a novel whole-of-community approach to disaster response where professionals and government agencies would focus on monitoring and facilitation, and rely more on the self-managing capabilities of local communities.

Task 1.1 (Scope and requirements for the COBACORE tool) within WP1 has been completed in month 18 with the submission of D1.2 (State-of-art, trends and opportunities in damage and needs assessments in post-disaster environments). The domain exploration in the first months of the COBACORE project has focussed on defining a relevant scope and focus. This outline helps to find relevant cases that can be studied in Task 1.3. In Task 1.1 a list of factors and related dimensions has been introduced to classify various kinds of disasters. Through a collaborative effort, facilitated by Task 1.1 partners, an initial scope and focus has been defined, as illustrated in Milestone 1.1. Generally, the COBACORE project will examine disasters that exceed the capacities of a western/urban municipality or province (state), where a large –disconnected group– of citizens experience (major) disruptions in their daily life. Most importantly however is the extend time-horizon. The COBACORE project will not (only) focus on crisis or disasters with short-term effects but specifically aim at supporting long-term recovery and reconstruction needs. While this outcome might be revised in the course of the project, it provides the consortium with a guideline to direct their (research) efforts towards a common scope and focus.

After the scope and focus had been further examined via the case-study analysis Task 1.3 several issues and opportunities in relation to community involvement became apparent. This has resulted in the definition of the COBACORE concept as outlined in Milestone 1.2 and D1.1. We identify three main groups that are integral to the COBACORE concept: the affected community (comprised of groups and individuals), the responding community (comprised of organised groups and spontaneous volunteers) and responding professionals (composed of crisis response organisations and responsible governmental organisations). Between these groups we identify several issues and opportunities related to addressing the needs of the affected communities. A strong connection between the involved parties, facilitated by information and knowledge exchange, improves the efficiency and effectiveness of disaster response and recovery operations. How these connections would be facilitated by the platform is further described by the requirements outlined in D1.1.

Building on the COBACORE concept a state-of-the-art analysis has been conducted to examine the current status and development for the various aspects of the concept. In this analysis there has not only been a closer examination of the technological state-of-the-art, but also of the organisational structures and processes for the various interactions between the three core user groups. Hence the outcomes of the analysis will not only help to identify relevant technological developments, but also help to identify key success factors and incentives for the adoption of the platform by all three stakeholder groups. In addition to the analysis of the structures, processes and tools from organisations and communities within the scope of the COBACORE project, a similar analysis has been conducted for organisations in the (commercial) service domain, with a particular interest on how such organisations communicate with communities and individuals. The results of the state of the art analysis have been described in D1.2.

In addition to the definition of common terms used in the COBACORE project, Task 1.2 (Definition of a common frame of
reference) also extensively defined the factors and dimensions used to scope and focus used in the initial stages of the COBACORE project. Other terms and common vocabulary in the disaster response and recovery domain have been defined as well and integrated into the work of other work packages, milestones and deliverables. The common frame of reference helped to more clearly define the various user groups in the COBACORE concept. Furthermore the analysis has also illustrated the important point that specific individuals may be part of two or even three overall groups. For example an affected community member can also provide relief to other members and thus become part of the responding community. Finally, research has shown that within these groups, specific subgroups can be identified with varying requirements. For example within the responding community there might be groups that were organised pre-disaster and have some pre-existing structure, other groups might consist entirely of spontaneous volunteers. Such similar distinctions can also be made within the affected community (more or less directly affected) and the professional organisations (different responsibilities). This has resulted in the following overview of potential users in the COBACORE concept.

Building on the scope and focus defined in Task 1.1 several cases have been selected by Task 1.3 (Explore selected use cases) for further examination. For each of these cases several key questions have been defined, such as what tools and methods were employed for assessment and coordination efforts and how and to what extent the community was involved. These and many other questions formed the first-high level analysis of the selected cases. The answers to these questions provided input to the definition of the COBACORE concept, for example through the identification of common issues in collaborating with the community. The examined cases include the L’Aquila Italy Earthquake (2009), the Czech Republic Floods (2002), the Buncefield Industrial Accident (2005), the Katrina Hurricane (2005), the Japan Fukusima-DaiNi Tsunami (2011) and the floods in Germany (2013).

Building on the first analysis, the cases were further studied during the refinement of the COBACORE concept. In this stage the cases were re-examined using the various elements of the COBACORE concept, especially how the various stakeholder groups, as defined in the concept, operated in these cases. From this analysis generic process flows were drafted for each of these groups. Through an improved understanding these process flows helped to translate the COBACORE concept into specific requirements. In addition the process flows and the underlying information exchanges help to articulate the requirements for the architecture of the COBACORE platform. The case analyses also show where the gaps are between the COBACORE concept and the reality of the cases, which are either pitfalls or obstacles to overcome.

In the last stages of the case-studies more specific attention was given to the various stakeholders, their incentives and motivations to engage with other groups. This particular analysis will ensure that the results of the COBACORE project align closely with the needs of the various groups that the project aims to support. Combining these incentives with the results of the state of the art as described in Task 1.1 enables the identification and articulation of the potential of the COBACORE concept. It also gives an illustration of the added value of the COBACORE concept for each of the stakeholders groups, and thus improves their incentive to adopt the concept and platform. These results in turn have been used by Task 1.4 (Domain requirements for the COBACORE platform) and translated into requirements.

The studies and analyses conducted by WP1 have led to the definition of various requirements. These requirements stem from the processes analysis, the research into the various user groups and the potential added value resulting from overall domain exploration. Using the COBACORE concept, further requirements have been derived, through identifying various issues that exist between the different user groups. From these issues several key functions have been identified that would facilitate these interactions and that create an added value for each user group. The analysis has also led to the definition of non-functional requirements by Task 1.4 such as various methods for accessing the platform, options for localisation of platform features, user-interactions aspects, and privacy and security related requirements.

As mentioned, an important aspect of the tasks in WP1 is the consideration of the added value for the various user groups. This will ensure adoption of the platform as well as guidance of design decisions throughout the project. While extensive analysis has been done on all groups through the tasks in WP1, the responding professionals in particular require additional attention. Their motivations and constraints are generally more complex than those of the affected or responding community.
members. In addition these organisations are the initial targeted ‘customers’ or clients of the COBACORE platform. This additional analysis has led to the following value proposition:

"COBACORE facilitates the rapid needs identification in an affected community, but also visualises and mobilises the affected communities’ own capacity as well as those of any responding communities in order to directly meet those needs. However a community in crisis might be able to meet some of its own needs, but unable to meet others. External assistance during response, recovery and reconstruction is then needed to address those unmet needs. The platform will help external actors, mostly professionals, to target those needs that are not (yet) met by the direct environment. Closing the collaboration gaps between all involved parties, professionals, volunteers and affected community members, improving the efficiency and effectiveness of the overall disaster response."

WP2 Information framework

WP 2 has developed a series of data domains for response, recovery and reconstruction comprising Services, transport, Teaching and Learning, Social, Cultural, and Recreational, Housing and Accommodation, Working Life, Safety and Security, Health and Basic Needs, and the Environmental domain. Each of the core nine domains resides as series of base data layers including meta-data, sources and formats. The data layers have been identified as integral to informing the recovery and reconstruction process and to improving situational awareness based on views and opinions from the professional responder community (Objective 1).

A series of data sets have been identified based on internal consortium expertise and in liaison with prospective end-users/stakeholder groups (Objective 2). Key barriers identified include the formatting and secure storage of the various data sets/layers and how these can be collated and stored in a format conducive to interoperability (Objective 3). WP2 is presently in the process of building a bespoke disaster recovery and reconstruction ontology that will promote interoperability and build upon existing established vocabularies/terms where possible. A further consideration from the data framework perspective is developing the ‘inter-linkages’ and developing ‘relationships’ between the various datasets/data layers. Semantic intelligence is being integrated into the data framework to facilitate ‘sense-making’ and to address the queries being posted by the client (COBACORE platform) in line with Objective 4.

WP2 is comprised of three tasks which serve to underpin the associated deliverables. In Task 2.1 (Data Identification for damage and post-crisis needs assessment) a tabular framework was developed (contained within D2.1) which detailed the key data requirements across the different phases of the disaster cycle. Tables detailed the potential sources and formats of such datasets. However, in keeping with the increased emphasis and the unique positioning of the COBACORE project within the transition from late-response to recovery and reconstruction, greater emphasis was placed on validation of datasets from those actors involved in the recovery and reconstruction as opposed to those involved in immediate response. Indeed as the actors involved differ greatly, so do the data needs at the different points in the cycle. The task resulted in D2.1 (Data Identification).

The COBACORE data model, as defined by Task 2.3 (Define practical information models and hierarchies), is predicated on a spatially referenced framework. The structural composition of the individual data layers and the inter-relationships between the various data sets is developed through the adaptation of a semantic architectural framework. The ability of the COBACORE data framework to interface with existing Disaster Management Information Systems (DMISs) is facilitated through the development of a bespoke ontology for disaster recovery and reconstruction.

In the period M1-M18 an alpha and a beta version of the data framework have been developed by Task 2.2 (Development of the Data Framework). In collaboration with WP4 it was decided that the best way to progress technical development was to create a ‘prototype’ of the COBACORE platform. This would serve as a basis for discussion and act as a starting point onto which additional features and functions could be progressed. To facilitate the prototype, an alpha data framework was conceptualised. This tentative framework was predicated on a snow disaster in Northern Ireland in March 2013 in which some of the development team has direct experience of the recovery and reconstruction operation. A more sophisticated (beta) version of the data framework was developed for the IMEV in Rotterdam in June 2014. Developed in collaboration with WP3
and WP5 the beta version depicted a flood-based scenario within Belfast, Northern Ireland.

The ideology was to develop the framework in harmony with the platform development and to undertake a series of integration and compatibility tests prior to the deploying the final framework for operationalization in the Final Evaluation (FINEV) by WP5. The final delivery of D2.3 includes all experience and associated changes in the structural composition of the information framework up to and including the FINEV at the end of the project.

A key achievement of WP2 has been the development of the semantic framework. This semantic framework is essential in facilitating robust matching of needs and capacities, as different users will use different terminology to express themselves. The matching approach utilized can be divided into two main components: (i) Semantic Matching, which exploits the COBACORE information model to infer candidate capacities for a target Need based on the common categories and subcategories they might belong to; (ii) Feature Matching, which applies a multi-criteria decision making approach to further analyse differences in those candidate capacities obtained from (i), predicated on the 4W (Who, What, Where, When) approach.

Furthermore, a dedicated dictionary was integrated with the information framework in order to permit the generation of additional synonyms for all stemmed words. As an example: the semantic framework allows for the recognition and classification of needs and capacities for example terms such as “car”, “van” and “truck” are all transport means. Using one of these terms in the need and another in the capacity would still result in a potential match between need and capacity as the system will generate a ‘ranked’ list of relevant Capacities associated with a registered Need. The ‘effectiveness’ (accuracy of the matches) and ‘efficiency’ (speed of the matches) was improved and streamlined following a series of in-house testing exercises conducted between IMEV2 and the FINEV events. The learning outcomes from these series of in-house tests and how this influenced the final overall information framework design are detailed in D2.3 (Development of data framework).

One of the key value propositions of the information framework as deployed in the FINEV event is inter-operability. The final framework design permits authorised users to integrate and overlay their own data layers on top of the ‘live’ data being captured within the COBACORE system. The overriding objective of the COBACORE WP2 development team was to design and implement an information framework that not only closed the ‘data’ gaps professional and affected communities but to design a system that stimulated and promoted data sharing between responding professionals. To achieve this it was imperative that the COBACORE Information Framework was compatible with existing Disaster Management Systems.

Feedback from responding professionals in IMEV, IMEV2 and the FINEV identified this as one of the most ‘appealing’ and value enhancing aspects of the COBACORE concept. As such, the Information framework serves as an essential pillar of the back-office infrastructure facilitating the operational capacities of the COBACORE platform. The ontology and semantic architecture is primarily focused on the core concepts for disaster recovery and reconstruction. The architecture provides a foundation for the future expansion of disaster recovery and reconstruction ontology development as well as additional refinement of the semantic capacities within the disaster recovery domain post-project.

WP3 Concept development and support mechanisms
The core objective of WP3 is to create the ‘COBACORE platform concept’, and provide the project with a structured approach to platform feature development. WP3 specified desired functionalities of the COBACORE platform based on the domain analyses from WP1. It provided guidance to WP2 and WP4 in implementing these functionalities in an effective way that satisfies stated requirements from WP1 (Domain analysis) and WP5 (Evaluations). WP3 provided functional specifications of platform features to WP2 and WP4, and supported the implementation process by providing feedback on design proposals and by giving input on implementation issues. Furthermore, WP3 supported WP5 in identifying platform feature evaluation options. Additionally, WP3 created perspectives on how the COBACORE platform could be used in practice, and thus provided WP6 with valuable narratives that can be used to engage with stakeholders in exploitation options.

Throughout the project, WP3 has played a crucial role in shaping the development path of the COBACORE platform. The
COBACORE project has been set up as a CD&E (Concept, Development & Experimentation) project. The project features a number of development cycles that include both concept development, experimentation and evaluation activities. To this end, WP3 introduced a simple incremental platform development process: the ‘issues, functions and features’ approach, where we add new features as we learn more about the interests and preferences of stakeholders through the activities of WP1 (domain analysis) and WP5 (Evaluation and experimentation).

WP3 obtained from WP1 that there are three main issues between these groups: (1) problematic information exchange between the professional community and the affected community, (2) significant collaboration and coordination issues between the professional community and the responding community and (3) inefficiencies in needs and capacity matching between the affected and responding communities. These three issues form the core issues that we confront in this project.

From these three issues, WP3 derived three major COBACORE platform functions: (1) enhance information exchange between the professional community and the affected community, (2) facilitate collaboration between the professional community and the responding community and (3) improve needs and capacities matching between the affected and the responding communities. From these functions, WP3 derives specific platform features in a number of phases.

In this first part of the project, the WP3 team defined the core feature set and in the subsequent expansion phases new features will be added that build upon the core set, taking into feedback from stakeholders during evaluation sessions. Not all proposed features might be realisable during the project due to time constraints or technical limitations, so certain features might need to be deferred to follow-up projects. For every suggested feature, there are multiple ways to implement them. Possible implementations might differ in terms of process workflow, interface layout or technical design. WP3 provides implementation-independent feature descriptions. The form in which a feature is eventually implemented results from collaboration between the WP2, WP3, WP4 and WP5 team.

In Task 3.1 (Development of user interface concepts) the core set of functionalities was established: a set of 10 feature descriptions that form the foundation of the platform’s behaviour. Task 3.2 was carried out in tandem with Task 3.1 during the reporting period. Via design sessions, the core set of features was developed and established in D3.1. In these sessions, proposals for interface components were discussed, and further detailed from a functional perspective (i.e. their dependency on information contained in the platform, and dependency on other features). D3.1 contains the specifications for these core features, including primary user community, interdependencies, required information input, information output, interaction patterns and interface elements and suggested evaluation criteria per feature.

Task 3.2 covered the development of functional mechanisms. In this task, the main functions of the COBACORE platform were to be specified, based on the requirements from WP1, information models from (WP2), experimentation and evaluation requirements (WP5), and technical boundaries provided by WP4. The resulting D3.2 contains a description of the core concepts of the COBACORE platform, the underlying assumptions and information elements, and introduces a number of design patterns that serve as blueprints for new platform features. D3.2 defines the key concepts that drive the COBACORE platform: Need, Capacity, Actor and Activity, and how they interrelate. These definitions have been adopted into platform development by WP4. The new features proposed in D3.2 build upon the initial core set introduced in D3.1. D3.2 introduces 25 new features, organised in different thematic categories. Each feature proposal is described in terms of input-output relationships, preferred interaction patterns and evaluation criteria. Most of the 35 features proposals from D3.1 and D3.2 have been implemented during the course of the project through the work performed in WP4, and evaluated in the FINEV (October 2015).

Task 3.3 covers the specification of use scenarios and procedures for the COBACORE platform. The resulting D3.3 presents a vision on how the COBACORE platform could be used from a community- and organisational point of view. The document does so by presenting five main use forms: the COBACORE frames. Each frame represents a dominant use scenario and highlights specific platform features. D3.3 also captures explorative work on cross-cutting themes such as governance, misuse and trust. The work from this task has provided critical input for the organisation of the IMEV2 and FINEV (WP5) and has helped to steer platform development (WP4).
WP4 Platform and Interfaces

The main objective of WP4 is to design and develop the COBACORE platform. The platform design is based on two main pillars. The first one is a set of technical requirements derived from an exhaustive analysis of requirements given by other COBACORE WPs. The second one is a survey of existing service platforms relevant to the domain and technology addressed by the COBACORE project.

Task 4.1 (Technical requirements, architecture and technologies) performed a complete study of the different high-level requirements found in the documents generated by the different WPs providing the fundamental characteristics needed in the COBACORE platform. Derived from that, a set of technical requirements for the COBACORE platform has been provided. During this task, research on related platforms has been performed, i.e. the state of the art in the COBACORE domain. A literature research on institutional platforms and services for spatial information has been done, followed by a research on community platforms and services for crowd-sourced spatial information. For better understanding of the COBACORE platform features, WP4 described the different architectural viewpoints for the COBACORE platform and their relation with the different WPs inside the project, as well as the Service-Oriented Architecture concept for the platform.

Task 4.2 (Core platform specification) provided the functional description of the COBACORE platform, described the overall architecture while going through the different modules and services that belong to the platform, focusing on objectives and relations with the features as defined by WP3 in D3.1. Also, the most relevant tools and technologies were selected for building the COBACORE platform. The work from Task 4.1 and 4.2 has been documented in D4.1. That document represents the main implementation guide used for the development of the two planned releases of the COBACORE platform, and as such intends to cover in sufficient detail all of the design issues which determine the final platform services and performance. The document reflects in technical terms the most important directions and requirements established in other WPs of the project.

Task 4.3 (Development and verification of the core platform) and Task 4.4 (Development of COBACORE information models and procedures) mainly focused on the intermediate release of the COBACORE platform, which covers a subset of the overall platform design as specified in D4.1. The subset of functionalities implemented in the Intermediate Release has been notably chosen based on end-user functional feature priorities defined in WP3 so as to provide suitable means for end-user evaluation sessions organised in WP5; in particular for the IMEV session in June 2014. The main requirements and decisions leading to the implementation of the Intermediate Release have been presented, and also the description of the overall technical approach chosen to develop the selected components, making proper correspondence to the overall platform design specified in D4.1. Details on the implementation of server-side and web client components have been provided, focusing on end-user interfacing aspects, and a description of the key technologies and tools used. Also, WP4 provided details on the implementation of the mobile app client, which relies on the same HTTP API, enabled by the web-server and used by the web client, as well as information on key technologies.

The Intermediate Release of the COBACORE platform has proven to be a convenient and effective tool allowing end-users to test an early proof-of-concept of the anticipated COBACORE solution. From the technical point of view, the Intermediate Release platform reflects partially the target platform design specified in D4.1. The work performed during Task 4.3 and Task 4.4 has been documented in D4.2 (Intermediate platform implementation report).

For Task 4.5 (Integration and verification of the complete COBACORE platform) technical testing was carried out to verify the server-side and web client components implementation correctness. Also, technical testing of the HTTP API has been performed to verify the mobile platform access to the COBACORE platform.

The Final Release of the COBACORE platform built upon the overall architecture and followed the iterative process described in the document D4.1 (Core platform requirements and architecture design). Functions implemented in the Final Platform
Release have been chosen based on priorities given by end-users during evaluation sessions. Each session provided the participants with an increasingly sophisticated prototype, with major platform releases being available at the IMEV2 and FINEV sessions. The final set of features defined in WP3 and included into the COBACORE platform is documented in D4.3 (Final platform implementation report). The list of implemented features as well as their implementation scope was the result of different discussions with different project WP participants (notably WP3 and WP5). Based on a list of high level features and functions emanating from IMEV2 and other consortium evaluation sessions, WP3 and WP4 members elaborated a master development list of prioritised functionalities for the FINEV event; covering both the web and mobile client. After IMEV2, corrections were made to the existing features and new functionalities were added to get to the final status of the Final Release.

The COBACORE Mobile application has been developed and tested during this reporting period, especially during the FINEV session, where mobile application played an important role. Not all features defined in WP3 apply directly to the COBACORE mobile application, since it was originally thought to be used by affected and responding communities. How users manage mobile and desktop applications is very different. User interface needed to be redesigned for mobile application, where interaction with the platform must be quicker than in desktop application. Also, features that were only for professionals were removed from the mobile application, since professionals were not the target user for this platform.

Security was an important issue to be improved during this project period. In WP2, a distinction between different segments in the path from data repositories to user terminals, where data protection is needed, was described. With that in mind, WP4 focused on how to connect securely to the databases and protect that data by using encryption, and also protect the connection between the end users and the COBACORE platform, that is, the protection of information flows provided by the platform. The different security mechanisms implemented into the COBACORE platform are described in D4.3.

As part of Task 4.4 the semantic framework component was developed in collaboration with WP2, and involved the production of a semantic algorithm to match users with needs to users with capacities. This algorithm then needed implemented as an integrated software component which could be scaled along with the other server side components and its outputs used by both the web and mobile components. Details of this development and integration are described in D4.3 (Final platform implementation report).

In order to facilitate training of the platform during the different evaluation sessions, WP4 has produced a set of user and administrator guidelines to allow them use and evaluate the platform (both web and mobile) by knowing the different features implemented. These guidelines can be found in D4.4 (COBACORE platform user and administration guides). The user parts were distributed during the FINEV to help participants on using the platform. To enable the platform to be quickly deployed and configured by non-technical users a number of deployment options have been developed to facilitate this kind of rapid deployment. A deployment API is available to allow deployment operations to be executed by authenticated users. Details about this API can also be found in D4.4.

WP5 Experimentation and Evaluation
The main objective of WP5 is to organise experiments that evaluate the COBACORE concept and support system, draw conclusions about its operational value in practice, and provide refinement advice for further development of the COBACORE platform.

Task 5.1 (Development of the evaluation agenda and performance criteria) provided in D5.1 a framework of performance assessment indicators that has been used for concept development and platform specification. We assess performance using various measurable indicators such as whole of community performance, relief effectiveness, functional performance, usability, information quality, system performance and agility and interoperability. D5.1 (Performance Assessment Indicators) provides an overview of the indicators that were used in the evaluation sessions and the underlying justification.
Task 5.2 (Organisation of feedback sessions and partial evaluation) covered the organisation of feedback sessions and partial evaluations in Dublin, Belfast and the upgraded second intermediate evaluation in Ahrweiler. In these sessions we asked feedback on specific parts of the system (e.g. functionalities for mobile application) and concept (e.g. community liaison team) and design recommendation. This task included the definition of guidelines for evaluations, preparatory activities, relevant qualitative and quantitative evaluation measures, structured manner to report feedback and covered the organisation and execution of the evaluation sessions and generation of assessment feedback and advice. COBACORE partners worked together in engaging relevant stakeholders, demonstrations and evaluation sessions.

To draw preliminary conclusions about operational value of the COBACORE platform in practice, the following research questions were investigated in Task 5.3 (Evaluation of the intermediate platform in an operational setting):

- Do end-users perceive that the COBACORE platform has a positive effect on community-based needs assessment and recovery planning?
- Does the COBACORE platform close gaps in information exchange and collaboration between the communities?
- Does the COBACORE platform enable the sharing of the right kind of information?
- Is COBACORE functionality and information useful and usable for supporting: shared situation understanding; information sharing and collaboration; empowerment and need-capacity matching?
- Does the COBACORE platform fit with processes, procedures and practices of all user groups?

A two day evaluation exercise was organised in Rotterdam to test and investigate the above research questions. On the first day, background information about the COBACORE project and concept was provided to end-users, experts and stakeholders. Participants received a demonstration of the COBACORE platform and instructions to use its functionality. They performed a training session to familiarise themselves with the Belfast flooding scenario and their roles. On the second day participants used the COBACORE platform to perform the tasks associated with their roles. End-users and experts performed their tasks and experienced the COBACORE platform in a simulated environment: the COBAGAME. The COBAGame is a desk-top simulation consisting of a post-crisis scenario, workflows between professionals, affected and responding community members, profiles describing the situation to participants, task descriptions, action forms for responding community members and professionals, and game management.

The COBAGAME enabled end-users, experts and stakeholders to personally experience information exchange and collaboration in a post-crisis situation using the intermediate COBACORE platform. The semi-controlled environment enabled observation, performance measurement and discussion about operational value and needs for improvement. In the afternoon participants used a mix of social media (e.g. Twitter, Facebook) to be able to compare experiences. The location in Rotterdam provided room for five affected communities, three responding communities, three responding professionals and a group of coordinating professionals. Thirty-seven individuals participated in the evaluation. The IMEV provided many insights on performance on specified dimensions (conclusions can be found in D5.2). It was concluded, among others, that tools for professionals and collaboration support between professionals and responding communities needs to be improved.

Task 5.4 covered the organisation, execution and assessment of the final demonstrator in an operational setting. For this evaluation a suitable environment was found at the premises of the Academy for Crisis Management, Emergency Planning and Civil Protection (AKNZ) in Ahrweiler Germany. This environment allowed the proper assessment of the operational value of COBACORE for German and Dutch professionals and responding and affected community members. In the COBACORE simulation environment (COBAgame) a cross-border earthquake scenario with cascading effects was developed and realistic organizational structures, procedures and profiles were used to test the operational value of the COBACORE concept, platform and community liaison team. Evaluation measures and methods (observation, questionnaire, focus group) we selected to learn about operational value, but also to get insights in use and adoption. This provided relevant feedback for post project development. The findings of the final evaluation are described in D5.3 (Evaluation Report on the Final Evaluation).

Potential Impact:
A good idea does not equal a good solution. In the COBACORE project, we have built up a vision about community-based disaster recovery and experienced how smartly designed technology can help to realise that vision. However, at the end of the project, that is just what it is: a vision and a technology demonstrator. In our many evaluation sessions and dissemination activities, we have been met with great enthusiasm about our project, our vision and our results. However, we have also seen widely differing interests among our stakeholder parties. Some focus on citizen capacity, others focus on professional situation awareness. Some see opportunities in the realm of volunteer management; others view the platform as a complement to existing operational environments. For some privacy is a huge concern, other look forward to an entirely open data society. This is hardly unsurprising since disaster management (preparedness, response and recovery) is a complex undertaking that is governed by many rules, laws, procedures, parties and human behaviours. Our vision of a common community collaboration platform will only succeed if it attains a critical mass of users and the support of many parties. So, how can that be realised when interests and options differ so much?

It is important to realise that the future success of the COBACORE platform does not depend on technology alone. The technology that drives the COBACORE platform is readily available. What is needed is that the right circumstances are created for a community-wide adoption, based on the acknowledgment of our core principle: effective disaster recovery demands that existing collaboration gaps are closed – and the same holds for the other phases of the disaster management cycle. Practically speaking, communities need to interact more closely than they normally do. Professionals need to allow for a greater role of citizens in disaster recovery and they need to be aware of the actions deployed by those citizens. Citizens need to become more aware of the responsibilities and constraints of professionals, and obtain a better understanding of their own limitations. And, most importantly, as a society, we need rethink our approaches to disaster management. We need new perspectives on the role of communities, we need new rules that new roles possible, and we need to invest in the creation of a new safety culture – one that is driven by the notion that disaster management is a society-wide responsibility in which all types of communities have an obligation to communicate, contribute, and collaborate.

The above might sound a bit abstract, but has very practical connotations. For example, in most European member states, government parties are still struggling with the role of spontaneous volunteers in their disaster management activities. There are many reasons for this, such as legal barriers, distrust of civilian capabilities, resistance to change or lack of proper training. Also, there are many citizen-led initiatives that center on self-reliance in communities, but they rarely get enough uptake to really make a difference in disaster situations. Conditions differ significantly per area, and what would work in one region, would not in another, due to differences in organisational structures, regulations, culture, existing systems, and so on.

To this end, COBACORE developed a co-creation methodology called ‘Samenredzaam’, a Dutch phrase that translates to ‘being self-reliant, together’. Samenredzaam is a step-wise program through which stakeholder parties can build up a community-based disaster-management approach. It is based on the well-known Appreciative Inquiry method, and revolves around creating a mutual understanding among parties, and crafting novel concepts that are mutually acceptable – for instance, on how citizens can safely and effectively support disaster management efforts, or how trained volunteer groups can be unified with professional teams. In trials with Dutch regional professionals and volunteer groups, we have experienced great enthusiasm among participants and seen first-hand how collaboration gaps can dissipate through open dialogue and co-creation. After checks on the applicability of the Samenredzaam program in other parts of Europe, the COBACORE team members are convinced that an open dialogue between professional and citizen communities, such the type of dialogue that Samenredzaam fosters, is the key to creating a new perspective on disaster management. In turn, this provides the right breeding ground for technological innovations such as the COBACORE platform. Reports D6.7 (Results from the adoption workshops in the Dutch national safety domain) and D6.8 (Guidelines for national implementation of the COBACORE platform) introduce the methodology, and show the reception by Dutch Safety Region representatives.

In general, all consortium partners are active in exploiting the various project results. D6.2 (Report on exploitation opportunities and sustained development for the COBACORE platform) provides an extensive overview of exploitation directions and current opportunities that the consortium partners are exploring.
Alternative exploitation directions

The COBACORE project was positioned as a disaster recovery project. However, our ideas and solutions are very much applicable to other contexts as well.

COBACORE identified core issues in the recovery phase after a disaster. We also realised that the same issues are present in disaster preparation and response too. Does that mean that the COBACORE platform is readily suitable for the preparation or response phase? No. To make the platform suitable for disaster preparedness or response, it requires reassessment of its working principles, its interfaces and information structures, as the different disaster phases require different focal points of support for stakeholders. Does that undermine the idea to convert the COBACORE platform to an application in a different phase? Not really, but it does underline that fact that one cannot carelessly propose the current COBACORE prototype platform as a preparedness or response platform.

Another option is to view the COBACORE results in light of day-to-day urban city management. One could think of the COBACORE platform being the center point of neighbourhood development, where needs, capacities, activities and information are brought together. Disaster recovery is akin to normal urban development, with many community members needing to interact and a strong emphasis on self-organisation among communities. The big difference is the level of distress in a disaster recovery situation, and the depth of disruption. The question beckons: is disaster recovery an intensified form of urban development, or a situation with a totally different dynamic? In the former case, one could argue that the COBACORE platform would be easily transferrable urban development, and could serve as a common collaboration ground for municipal parties, citizens and local businesses. One could also think of deploying the platform during large-scale event, such as national festivities or large-scale sporting event. Such events have in common that they require the participation of the entirety of a city to succeed, and that is where the COBACORE platform could come into play – as a common information and capacity sharing environment that links organising parties with local communities.

There are many other uses for our platform. For instance, with the current refugee crisis across Europe, many urban areas need to quickly assemble shelter capacities to care for incoming refugees. Because of the sheer volume of refugee influx, professional parties are quickly overburdened and rely on support from volunteer groups such as the Red Cross and local communities. This makes an ideal breeding group for COBACORE-like solutions, where a demanding and complex group of affected people (e.g. the refugees) need to be jointly taken care of professionals and responding communities. Various COBACORE consortium partners are working with their local government agencies to bring inspiration from the project into the refugee debate.

Dissemination activities

website, Geneva event, final event, dissemination materials, newsletter, conferences, scientific publications, presentations, workshops, stakeholder interactions.

Throughout the project, the consortium has maintained a strong and focussed dissemination strategy, aimed to maximising project impact and reaching out across key stakeholder groupings. The strategy incorporated all aspects of dissemination including offline and online content, participation by consortium members in conferences and workshops, contributions to academic publications, engagement with the media and also with established communities in the field of disaster recovery. For a detailed list of dissemination activities, we refer the reader to periodic dissemination reports from WP6: D6.4 (Dissemination Report Reporting Period 1) and D6.5 (Dissemination Report Reporting Period 2). We will highlight some key dissemination activities below.

The consortium partners have frequently presented the project in national and international settings. There have been frequent exchanges with local government representatives, for evaluation, information and exploitation purposes, and every partner has been able to use the COBACORE project as a way to acquire new connections. The project has also been introduced in various established international venues, such as the International Disaster and Risk Conference (IDRC) in Davos, and the Information Systems for Crisis Response and Management (ISCRAM) conference and project partners have
been proactive in integrating COBACORE project results into the standing programs of their own organisations.

Online presence.

The COBACORE project has invested greatly in its online presence, with a comprehensive website, and the use of various social media channels. The website (www.cobacore.eu) contains extensive information about the project and frequent blog posts by consortium members about relevant topics. The site contains a link to the COBACORE public demonstration platform and provides project reports, promotional material and other background information. The project’s Twitter handle (@cobacore) has been used extensively, and is often added in news tweets that relate to volunteer work, crowdsourcing and resilience.

Interaction with other EU projects

The COBACORE project has interacted with many other related EU FP7 and H2020 projects, such as S-Help, Slandáil, FORTRESS, DESTRIERO, CascEff, SecInCore, EmerGent, TACTIC, CRISMA, DRIVER, RESILENS and others. Through joint conference presence and individual interactions, an active exchange of ideas has taken place throughout the project. Furthermore, projects were invited to join evaluation sessions and events, project progress and results have been shared via newsletters, direct communication and social media links. Also, various peer-projects were present at the COBACORE final event in Leiden, and contributed through information stands, demonstrations and presentations.

Interactive workshop at the 2015 ISCRAM conference.

The COBACORE project has contributed significantly to the 2015 ISCRAM conference in Kristiansand, 2015. The ISCRAM (Information Systems for Crisis Response and Management) conference is held in high-regards by prominent researchers in the fields of systems for crisis response and disaster management, but is also well known in the practitioners circles. The COBACORE project attended the conference with a delegation from several of the consortium project partners, to not only present the project but also solicit input and feedback on the course taken. The COBACORE project used several ‘channels’ to engage with the conference which included several poster presentations, presentations in different tracks, and participating in speed networking events. The COBACORE project also presented itself with a stand placed centrally in the main atrium of the venue. Moreover, a modified version of the COBAGame was used to get participants interested and get to know the project in a hands-on and immersive manner. These various channels led to significant interest in the project and emphasized the unique approach of the COBACORE project. Deliverable 6.3 describes the COBACORE contribution to the ISCRAM conference in detail.

Training and Education

Training, Education and Continued Professional Development (CPD) has been an important topic of interest for the consortium with the Red Cross organisations as prime stakeholders. Platform use training and Community Liaison officer role training have been matured by the NLRC in advance of the Final Evaluation exercise in Germany, October 2015, and the execution of the roles and the platform at that time showed it to be a success. A workshop in the HQ of the IFRC in Geneva, November 2015 demonstrated the platform to these primary potential end-users and emphasised the educational aspect of the project for humanitarian agencies.

The co-creation method has been applied in workshops with DRIVER (FP7 Project) and used in training with the IFV (Institute of Physical Safety, Netherlands). The community liaison team training will be carried over to the training portfolio of both the Netherlands Red Cross and the German Red Cross. Training uses have been recommended to the Canadian government by the Conference Board of Canada and both Tilburg University and the University of Zilina have adopted the COBACORE concept, platform and game in their Disaster Risk Reduction curricula. These results are outlined in detail in Deliverable 6.2.

Final event: NEW PERSPECTIVES 2016: Rethinking the Role of Communities in Disaster Management.

The COBACORE final event took place in Leiden, Netherlands on March 1st 2016 with the title: ‘NEW PERSPECTIVES 2016: Rethinking the Role of Communities in Disaster Management’. There were approximately 90 people in attendance, including professionals in the areas of disaster management, community and volunteer engagement, big data, technology and
communications. In addition, delegates from several other EU projects participated in the event, as well as volunteers from Red Cross groups and academics from all related disciplines. Collaboration and co-creation was the focus of the event, and after the three keynote speakers had made their presentations everybody in the room was invited to become an active part of the day, instead of a passive observer. Focus groups were formed where pre-selected speakers gave a brief but inspirational talk about their area of expertise, before a challenge was given to the group to come up with their own ideas relating to problem-solving in this area. At the event’s closing all of the groups presented their ideas to the assembled audience and winners were chosen, who won the opportunity to meet with COBACORE team members in TNO to further develop their ideas. Online, the spirit of a creative fun event encouraged the international audience to tweet about their experiences, making the reach of the event extend far beyond the confines of the room. All delegates received parting gifts of a COBACORE pen and notebook with the project logos and also some duct tape which bore the tagline COBACORE: Closing Collaboration Gaps.

Exploitation agreement
At the final plenary meeting in Bratislava (Dec 2015) the consortium partners agreed that within the Project their co-operation was such that results, including the software, were jointly developed within the framework of the Project, and should therefore be qualified as ‘jointly-owned results’ and ‘jointly-owned software’. This means that after signing the exploitation agreement all partners will own equal right and title to the complete set of ‘exploitable foreground’ outputs resulting from the COBACORE project. This means, amongst other things, that each of the partners can follow their own, most promising, route towards profitable exploitation.

To maximise the exploitation of all foreground results, the COBACORE partners agreed to set up an exploitation agreement (EA). This EA replaces the Consortium Agreement (CA) at the end of the project.

The key elements of the Exploitation Agreement are as follows:

• All partners agree that the way we obtained the foreground results was such that none of the partners can claim ownership of a specific part. Therefore, the partners agreed on joint ownership of all results.
• All partners offer all other partners a free license for use.
• The software can be offered by all partners as “Software as a Service” (SaaS) to third parties. Users only get the right to use the COBACORE system; there is no need to transfer the software to users.
• In exceptional cases the software might need to be transferred to a user. This will be strongly discouraged and the user will not get the rights for subsequent transfer.
• The EA supports the adaptation of the COBACORE concept/system to local requirements.

With the EA the partners intend to continue the cooperation, using the strengths of each partner. However, the free license for use and the lack of background needed for exploitation makes partners independent from each other. The consortium believes that this strategy allows for the a maximum level of exploitation of project results.

List of Websites:
http://www.cobacore.eu

Related information

| Result In Brief | Communities recover faster from disaster through platform collaboration |
| Documents and Publications | final1-final-report-additional-images.pdf |

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NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK - TNO
Netherlands