ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

DiCoMa

INNOVATION REPORT

Enabling better decision-making and helping to save lives

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With crises and disasters seemingly on the rise in terms of both frequency and scale, whether prompted by warring conflict and ecological change or by natural disasters such as earthquakes and floods, the need for agencies, often from different countries, to cooperate has become urgent. And increasingly, crisis management is swamped with huge amounts of often conflicting information upon which decisions need to be made in real time.

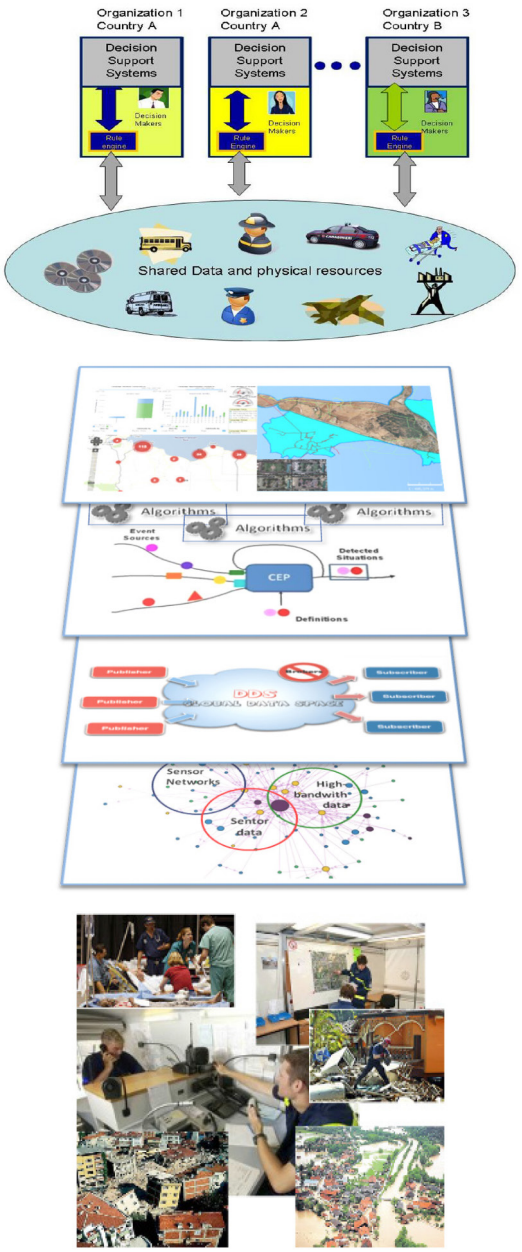
The ITEA 2 DiCoMa project geared its efforts to developing a new software platform for crisis and disaster management based on open standards and designed to be fully interoperable with disaster-management systems around the world. In developing a set of software tools, DiCoMa helps decision-makers in disaster-management agencies, governments and non-governmental organisations.

Integration

The project's main innovations have been the integration of real-time events for crisis data-processing based on a common information model as well as control and decision support systems in a single framework based on a subscription model to download and upload data, in all creating an open and service-oriented platform for crisis management. The Decision Support System (DSS), based upon advanced algorithms, allows decision-makers to predict the effects of given decisions in order to select the best one.

Coherence

The EU stated objective to be more involved in the immediate crisis response when natural disasters, terrorist attacks or pandemics occur in one or more of its member states will be guided by the research on information technologies that can provide an accurate and timely picture of the operational situation at hand. The DiCoMa project offers an important contribution to meeting this new challenge by focusing on the cooperative idea of sharing know-how in the early stages of a crisis and, therefore, facilitating the use of harmonised procedures through a common crisis database. The project undertook an analysis of the potential European logistics stakeholders that could be involved in a pan-European space in order to detect the synergies that would be needed to combat specific types of crisis. For the different emergency services, DiCoMa improves Command and Control decision-making, to produce one coherent force, eliminating duplication and sharing intelligence and information as it becomes available in real time.



DiCoMa conceptual overview

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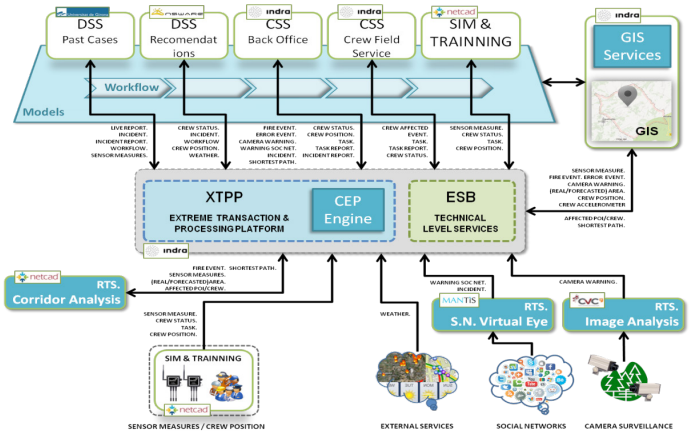
Cooperation

Some of the work benefited from cooperation with other projects, such as SAGAZ, whose aim was to create an integrated GIS-based platform allowing the simulation and early detection of several types of natural disasters, the combination of different technologies and applications as well as the fast and effective mobilisation of resources to prevent new natural disasters or to minimise existing ones. The work of another research project, PROMETEO, which aims to optimise public resources to minimise the risk of wildfires and environmental damage, also proved particularly relevant to DiCoMa with respect to the Integrated DiCoMa Forest Fire Scenario demonstration in which the XTPP platform is central (see figure).



Interoperability

With interoperability a prerequisite for effective collaboration and communication, the project focused on a software architecture to support control and management of crisis and disasters, identifying existing standards, standardisation bodies, committees and recommendations to be incorporated in the requirements of the project and those critical technologies and protocols that required specific standardisation actions. Initiatives were taken in the International Steering Committee for Global Mapping (ISCGM) to develop a group of global geographic data sets of known and verified quality with consistent specifications to improve environmental protection and disaster management as well as assist organisations by providing a message structure for the transfer of information between computer-based systems for reliable decoding of this information. The project also actively participated in the Open Geospatial Consortium (OGC)/Risk and Crisis Management (RCM) Working Group to develop standards and best practices to network all types of sensors for Web-based discovery, access, control, integration, analysis, exploitation and visualisation of online sensors, transducers and sensor data repositories. OGC's current work on standards is geared towards open Service Oriented Architectures (SOA).

Exploitation

Several methods and tools have been produced for performing advanced monitoring, simulation and control in the crisis domain. In particular, image analysis algorithms, security rekeying mechanisms, a control support system (back-office and crew field service), a GIS system, a decision support system (resources and past cases), a social networks warning system and post-mortem analysis tools have been delivered. Furthermore, the project's simulation and training tool developed for the crisis domain is capable of modelling natural phenomena in order to improve the decision-making process among the different stakeholders. Ultimately, the assembly and integration of the DiCoMa eco-system of services and systems for data acquisition and processing has been finalised and an advanced control and decision platform for the disaster management domain delivered.

IIn terms of actual exploitation of these results, the consortium partners have been able to benefit from their involvement in the development process described above. Like Answare, for its new services and applications in fields like satellite systems and control centres, mobile apps in telemedicine or GIS for Earth Observation Systems. In the case of Indra, DiCoMa has helped to reinforce two of the company's products, iSPEED and CSS, for better positioning in the market. Regarding iSPEED, the information model of the XTPP platform has been extended to be able to manage a crisis in real time in both the full and the microedition version. In addition, a first parameterisation of the main qualities of service – prioritisation, reliability, historical, etc. – has been included on different types of data. Furthermore, iSPEED was hosted on an Android Smartphone in order to provide the crews with real-time information of both the crisis and the actions to be taken. With respect to the CSS, the scope of the Distribution Management System, used in the Energy domain, was extended to be able to deal with crisis scenarios too. Weather predictions and real-time crisis forecasting was integrated in the system as well as Social Networks warnings. The CSS was connected to the iSPEED platform to support real-time crew locations, action plans, crisis status and optimal paths for incident assistance. In addition, an android Crew Field Service application was developed for crews in the field.

In conclusion, the DiCoMa crisis platform is capable of dealing with the need to process the information and data obtained from a range of heterogeneous sources in real time and provide a decision-support framework for both in situ management and simulation training purposes. Eventually, to enable better decision-making and help save money (and lives) in the process.

More information:
www.dicoma.eu