ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

Project Results

DiCoMa

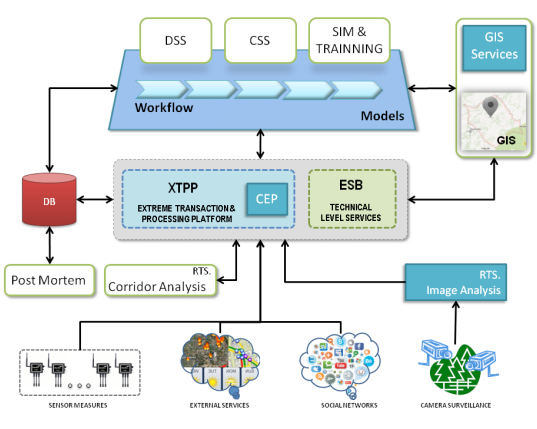
Better decision-making for saving lives

In the face of the growing frequency and scale of crises and disasters, crisis management is becoming swamped with huge amounts of often conflicting information upon which decisions need to be made in real time. The ITEA 2 DiCoMa project set about 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.

INTEGRATION AND COOPERATION

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, altogether conforming 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.

The DiCoMa project took up the challenge of the need to gain an accurate and timely picture of the operational situation at hand 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. An analysis of the potential European logistics stakeholders that could be involved in a pan-European space shared light on the synergies that would be needed to combat specific types of crisis to produce one coherent force eliminating duplication and enabling the sharing of intelligence and information in real time as they become available.



DiCoMa conceptual overview

INTEROPERABILITY AND STANDARDISATION

Interoperability is a prerequisite for effective collaboration and communication, so 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).

EXPLOITING THE RESULTS

Exploitation targets include:

- educating people dealing with disaster management about future possibilities and tools;
- expanding research lines and developing new disaster management solutions;
- using the DiCoMa results/know-how in other projects and sectors;
- commercialising the DiCoMa results; and
- publications, teaching and PhD research.

In terms of actual exploitation of these results, the consortium partners have been

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Partners

Answare
Athena GS3
Centre de Visio per Computador
Finnish Meteorological Institute Artic Research Centre
INDRA Software Labs
Infotripla Ltd
Mantis
Mattersoft
Mobisoft
Netcad
Oulu University of Applied Sciences
SAVOX Communications Oy
University of Deusto Tech
University of Girona
University of Seville
University of Technology in Catalunya
VTT Technical Research Centre of Finland

Countries involved

Finland
Israel
Spain
Turkey

Project start

December 2011

Project end

June 2014

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Project Results

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 in 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 respect of the State-of-the-Art technologies defined in DiCoMa, CVC, a specialist in human behaviour analysis in image sequences, will be using this knowledge for fire/smoke detection, trajectory analysis and stampede detection while VTT is going to implement a command and control centre (C3) for managing disaster control information and then integrate the results and prototypes with its Finnish industrial cooperation partners.

Several methods and tools have been produced for performing advanced monitoring, simulation and control in the crisis domain. The project's simulation and training tool developed for the crisis domain can model natural phenomena in order to improve the decision-making process among the different stakeholders. Furthermore, 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.

Ultimately, the DiCoMa crisis platform and decision-support framework for both in situ management and simulation training purposes not only enables better decision-making, but also helps save money (and lives) in the process.

Major project outcomes

DISSEMINATION

- 5 presentations to stakeholders (Tampere Region Disturbance Management Group, Intelligent Transport System network and International Emergency Management Society in Finland and Fire department of the Basque Country and Catalonia)
- 5 publications in journals (Springer-Verlag, CVIU,…)
- 3 conferences (SESAM 2013, CISIS 2013, ITS Europe 2014)
- Academic work: seminars, conferences and master courses

EXPLOITATION (SO FAR)

- New products:
  - Control Support System (Back Office and Crew Field Service)
  - Decision Support System (Recommendations and Past Cases)
  - Simulation and Training tool
  - Geographical Information System
  - Real Time Data and Services Integration Platform
- New services:
  - Social Networks Virtual Eye
  - Image Analysis
  - Post Mortem Analysis

STANDARDISATION

- Participation in the ISCGM
- Participation in the WS/ISDEM
- Participation in the Open Geospatial Consortium (OGC) and Risk and Crisis Management (RCM) Working Group

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ITEA 2 – Information Technology for European Advancement – is Europe's premier co-operative R&D programme driving pre-competitive research on embedded and distributed software-intensive systems and services.
As a EUREKA strategic Cluster, we support co-ordinated national funding submissions and provide the link between those who provide finance, technology and software engineering. Our aim is to mobilise a total of 20,000 person-years over the full eight-year period of our programme from 2006 to 2013.

ITEA 2-labelled projects are industry-driven initiatives building vital middleware and preparing standards to lay the foundations for the next generation of products, systems, appliances and services. Our programme results in real product innovation that boosts European competitiveness in a wide range of industries. Specifically, we play a key role in crucial application domains where software dominates, such as aerospace, automotive, consumer electronics, healthcare/medical systems and telecommunications.

ITEA 2 projects involve complementary R&D from at least two companies in two countries. We issue annual Calls for Projects, evaluate projects and help bring research partners together. Our projects are open to partners from large industrial companies and small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

EUREKA

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