



The snowball project



At a glance

Title: Lower the impact of aggravating factors in crisis situations thanks to adaptive foresight and decision-support tools

Instrument: Small or medium scale focused research actions

Total Cost: 5,205,927 €

EC Contribution: 3,882,462.70 €

Duration: 3 years

Start Date: 1st March 2014

Consortium: 11

Project Coordinator: Gedicom

Project Web Site:
www.snowball-project.eu

 **5,2M**
Financed budget

 **36**
Duration of the project in month

 **8**
Number of country involved in the project

 **11**
Number of partners involved in the project

Introduction

This is the first newsletter of the Snowball project. Five more are planned before the end of the project. Their objective is to keep you informed about the achievements of the project and the planned activities. Concerning this first newsletter, a lot has happened during the past 15 months. Here is a presentation of the project, and an overview of the first research conclusions.

The challenge

In the context of hyper-connected societies -where networks of all sorts are intertwined – with population densities growing everyday, it is necessary to better understand the cascading effects at play in a crisis.

Project Objectives

The overall objective of the project is to increase the preparedness of the European Union in respect to hazards that could amplify a large crisis. In the framework of SnowBall project, a dedicated tool will be developed in order to:

1. Apprehend and better predict and simulate the cascading effects that occur in a crisis;
2. Integrate population response and behavior to the simulation tools;
3. Provide decision support to public authorities and decision makers in the light of cascading effects simulations;
4. Test the efficiency of the tool in the frame of various demonstrations.

Methodology

To develop the platform dedicated to monitoring the crisis and predicting the cascading effects that might occur, Snowball has been analyzing the needs and the practices of potential end-users (decision makers, governments ...). A extensive study of previous crisis and the events which occurred and which amplified its impact has also been carried out, to determine a road map for forecasting cascading effects. On the basis of these two studies, the Snowball project is currently determining the necessary data to be fed into the tool, the links between crisis events and how they can be predicted.

Expected Results

- A methodology for apprehending cascading effects adaptable to different levels of data availability.
- A platform for assessing a crisis, predicting cascading effects, simulating the evolution, displaying the events and providing a decision support.



Meeting Freiburg

On the 3rd and 5th of March, consortium met in Freiburg, Germany for the 3rd Management Meeting of the project, after one year of working together. It was the opportunity to discuss the current developments of the project as well as to decide the best solutions to implement the Snowball platform.



Cascading effects

According to C. Delvosalle, a domino accident is "a cascade of events in which the consequences of a previous accident are increased both spatially and temporally by the following ones, thus leading to major accident." Natural disasters may be followed by other natural or technological disasters, creating a chain of disasters coupled with cascading effects. For example, a storm can provoke a mudslide that will itself be the cause of a transport accident. Another example well known of cascading effects of natural disasters is the earthquake of March 2011 in Japan which was followed by a tsunami. The seismic waves and the tsunami caused the nuclear accident of Fukushima. The behavior and reaction of the population in the case of disasters in chain is really important in order to predict the future reaction and act in order to thwart the domino effect of disasters. The study of cascading effects in Snowball will be based on historical disasters recorded in EM-DAT database (www.emdat.be). Disasters that occurred in Europe in the past gave a picture of the different dynamics and consequences of the cascading effect of disasters. Probabilistic approaches determining the cascading sequences will permit to forecast the future cascading effects of one event determined with specific characteristics.

Concerning one of the purpose of the Snowball project, "It will produce models of dependencies and effects in crisis situations (of both physical and human components) causing a cascading effect" (Topic SEC-2013.4.1-2)

Damage propagation in technological infrastructures

Recent studies have emphasized the importance of the domino effect in the occurrence and severity of major accidents that take place in the process industry (Hemmatian B., Abdolhamidzadeh B., Darbra R.M. and Casal J., "The significance of domino effect in chemical accidents", 2014).

Several industrial accidents that occurred in the past in Europe damaged commercial and industrial infrastructures, houses, affected fauna, flora and also water resources. The propagation of damages that occurs after a technological disaster will depend partly on the human behavior pre-, during and post- disaster.

The Snowball Platform: a tool for the future

Snowball information system is the new generation of "crisis management system". It is based on up-to-date technologies like Big Data storage system, mobile applications, advanced communication tools and predictive systems that take into account cascading effects. The proposed solution should allow the end-users to manage a crisis during its different phases: detection, monitoring, management and forecast, reporting and feedback. It is to be considered first like a strategic tool and an innovative operative system for crisis coordination. The designed solution implicates a wide range of actors at different levels: crisis coordination cell, first-responders, grid operators, authorities, and population. By using the OASIS standard model of data and selected data sources that cover the whole European Union, Snowball crisis management system is designed to be opened and to offer a SAS solution with minimized deployment constraints. This rough structure is the base of an incremental and improving process. Snowball is moving!

Online survey

To identify the scope and nature of practices and requirements of decision makers in charge of crisis or disaster management, the Ernst-Moritz-Arndt-University of Greifswald (EMAUG) has created an on-line survey in cooperation with Europroject, Gedicom, INEO, ISBM and FHG that is being conducted across Europe.

Information about the preparedness, training, as well as existing guidelines and plans for crises and (cross-border) disasters of the organization and/or country of the participant is gathered. On the basis of this information, existing gaps in crisis and disaster management can be identified and measures for improvement can be derived.

Additionally, information about potentially aggravating and mitigating behaviors of the general public, decision makers, first responders and operators of critical infrastructures is collected.

The results of this survey will serve as a basis for developing a dedicated tool and guidelines to increase the preparedness of EU in respect to hazards that could amplify a large crisis. To participate in this survey, please click on the link below: <http://goo.gl/N4Tsvr>

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