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## CONCEPT & BENEFITS

In **large-scale disaster situations**, local response units often act together with international units. Most of the acting organizations have their own structures for the coordination of their operating units in the field. They need to **collaborate across technological systems, organizational borders as well as language and cultural barriers**.

With the help of IDIRA, borders and barriers in disaster response can be overcome. The IDIRA system **supports disaster response coordination between organizations** by providing a set of guidelines and standard-based technical solutions for **interoperability and data sharing between different systems**. It enables a **common, coherent decision-making process** of all acting parties in order to save human lives and to minimize the total costs resulting from disastrous incidents.

### IDIRA...

- supports all stages of disaster management,
- integrates various available data sources and facilitates communication and information exchange between the different international responders,
- implements European and international disaster management procedures and supports EU policies and Civil Protection Mechanism,
- is easy to use and useful for handling daily operations, tactical decisions and strategic overview.

## PARTNERS

- Fraunhofer Institute for Transportation and Infrastructure Systems IVI
- Salzburg Research
- Frequentis
- Brimatech
- National and Kapodistrian University of Athens
- EPPO Earthquake Planning and Protection Organization
- German Red Cross, Saxony Branch
- Fire Safety Engineering Group, University of Greenwich
- IES Solutions
- Austrian Red Cross
- Hellenic Ministry of National Defence
- Ministry of Interior, Italy
- Satways
- TLP
- WAPMERR
- OLYMPIAKI Development Company of Western Greece
- KEMEA Center for Security Studies

## IDIRA

### INTEROPERABILITY OF DATA AND PROCEDURES IN LARGE-SCALE MULTINATIONAL DISASTER RESPONSE ACTIONS







## IDIRA COMPONENTS

IDIRA provides a conceptual framework for supporting and augmenting regionally available emergency management capacities. This is achieved by means of a flexibly deployable Mobile Integrated Command and Control Structure (MICS) with capabilities for coordination in large-scale disaster management. Thereby, it is possible to establish a stand-alone network, independent from public communication infrastructure that might be destroyed.

### HARDWARE COMPONENTS

#### ■ Mobile Integrated Command and Control Structure (MICS)

- consists of servers and IT equipment,
- all IDIRA services can be used without the need for an Internet connection.

#### ■ Wireless Gateway

- provides an independent communication network,
- self-alignment and establishment of connections.

#### ■ Communication Field Relay

- acts as a communication hub in the field,
- works as proxy for the data.

#### ■ Mobile Broadband Extender

- shared use of a far away 3G/4G network by first responders,
- offers connectivity via WIFI or Wired (Ethernet).

### SOFTWARE COMPONENTS

#### ■ IDIRA Common Operational Picture (COP)

- entry point to IDIRA features with map-based visualization for situational awareness,
- Web client (control room) and Android client (field),
- online or offline operation possible.

#### ■ Multinational Resource Management (MRM)

- fosters relief item exchange between organisations,
- web-based item catalogue using a three-dimensional taxonomy to categorise relief items.

#### ■ Missing Person Tracing (MPT)

- web/Android application with registry for storing and exchanging data of missing persons,
- compliant with PFIF specification (Google).

#### ■ EXODUS driven Evacuation Simulation

- multi-agent webGIS-based decision support tool to investigate evacuation procedures before/during evacuation incidents,
- provides estimates of time required to evacuate, graphical output and likely areas of congestion, etc.

#### ■ Chemical Substance Release Simulation (ChemSim)

- web-based simulation tool,
- algorithms library (web service) based on REST oriented, W3C and OGC compliant architecture.

#### ■ Forest fire propagation simulator

- web simulator providing the fire spread in time steps based on landscape, fuel and meteorological data.

#### ■ Incident and Resource Management

- observations, alerts and needs belonging to one event to be handled in the crisis scenario,
- resources and tasks assigned on tactical level.

#### ■ Exchange with legacy C&C-systems

- standards used to exchange data between IDIRA and external legacy C&C-systems, e. g. CAP, EDXL-RM, EDXL-SitRep.

#### ■ Road-network based decision support tools

- toolset including different routing approaches, reachability analysis, search for the nearest resource and optimal resource allocation.

#### ■ Load balancing

- adopts a predictive scheme for evaluating the load for available resources (e.g. hospitals and shelters),
- used in post-disaster scenarios for distributing persons and thereby avoiding congestions.

#### ■ Reachability optimized positioning

- simulation-based model on communication quality and potential positions for Wireless Gateways,
- defines optimal position for field commanders.

#### ■ Voice communication (WebTalk)

- enables communication by voice or short messages,
- direct communication, group messaging, voice conference.

#### ■ Sensor data integration

- interoperable integration of various data sources,
- raw sensor data transformed by Sensor Fusion Engine for visualization on COP.

#### ■ Donation management

- assessment of damage and collecting of applications for donations from affected people,
- applications editable for further processing.

#### ■ Ad-hoc data integration

- interfaces to import data from various sources and for different information types, e.g. resources, incidents, geographic and sensor data.

#### ■ Structured communication

- web system for translation of typical messages in disaster response with pre-defined, flexible forms.

#### ■ Early situational awareness (ESA)

- compiling information relevant for supra-regional and international forces in operations preparation,
- snapshot of current situation in a comprehensive picture.

