



DISASTER

**Data Interoperability Solution At Stakeholders Emergency Reaction
285069**

D7.21 Terms of reference within the Technical Committee (TCs) V1

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Abstract

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Executive summary

This document describes standardisation organisations and standardisation efforts and initiatives relevant to the DISASTER project. The document is the first one of a series of three volumes and it must be seen as the basis for a potential strategic movements for the project as far as standardisation is concerned. This first volume provides an initial list of possible candidates, a description of their activities and feasible ways of collaboration from the project.

Section 2 is split into Section 2.1, that identifies some pertinent international organisations, such as W3C, OASIS, JoinUp, and some of the Working Groups belonging to these organisations, and Section 2.2, devoted to national standardisation organisations. Finally, Section 3 deals with already set-up , tangible efforts and initiatives from the DISASTER project point of view.

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Abbreviations

ADMS Asset Description Metadata Schema

CAP Common Alerting Protocol

CEN Comité Européen de Normalisation; in English the European Committee for Standardisation

CENELEC Comité Européen de Normalisation Électrotechnique; in English, the European Committee for Electrotechnical Standardisation

CSAIL Computer Science and Artificial Intelligence Laboratory

DCAT Data Catalog Vocabulary

DIN Deutsches Institut für Normung; in English, the German Institute for Standardisation

DS Dansk Standard, Danmarks nationale standardiseringsorganisation; in English Danish Standards Foundation

EDXL Emergency Data Exchange Language

EMERGEL Emergency Elements

ERCIM European Research Consortium for Informatics and Mathematics

ETSI European Telecommunications Standards Institute

GeoSPARQL Geographic SPARQL Protocol and RDF Query Language

GML Geography Markup Language

HTTP Hypertext Transfer Protocol

IETF Internet Engineering Task Force

IRI Internationalised Resource Identifier

ISA Interoperability Solutions for Public Administrations

KML Keyhole Markup Language

KMS Kort & Matrikelstyrelsen; in English, (the Danish) National Survey and Cadastre

NEN Nederlands Normalisatie-instituut; in English, the Netherlands Standardization Institute

OASIS Organization for the Advancement of Structured Information Standards

OGC Open Geospatial Consortium

OWL Web Ontology Language

PURL Persistent Uniform Resource Locators

RADion Repository Asset Distribution

RDF Resource Description Framework

SLD Styled Layer Descriptor

URI Uniform Resource Identifier

W3C World Wide Web Consortium

WFS Web Feature Service

WMS Web Map Service

XML eXtensible Markup Language

Chapter 1

Introduction

This first deliverable volume devoted to standardisation takes charge of the first steps of any standardisation process: identifying potential experts and community. That is to say, the identification of organisations, working groups and initiatives that could be interesting for possible future collaboration.

As this is the first volume of a series of three and the project is still in an early stage, we do not put the focus on already definitive collaboration initiatives but on a effort to identify organisations and on analysiing potential opportunities. However, two standardisation efforts have been already launched, as it is described in Section 3, one has to do with the incorporation of the DISASTER ontology, EMERGEL, to the framework provided by the European JoinUp platform and with the collaboration with the W3C's Government Linked Data working group. The other is a possible collaboration with a working group established by DIN, the German Institute for Standardisation. Dialogue with the group is in its early stages and work is ongoing to obtain clarification and ensure their focus is in line with the DISASTER project.

Chapter 2

Standardisation organisations, working groups and technical committees

In this Section we present a number of interesting organisations, working groups and technical committees dealing with technical standardisation initiatives mainly in the context of emergency management but also regarding spatial data formalisation.

A description of each organisation is provided along with a brief account highlighting any working groups and technical committees they manage that may be of interest to the DISASTER project. Finally and when possible, some strategic lines of possible collaboration by the DISASTER project are provided.

2.1 International organisations

This section is devoted only to international organisations. It includes a high-level summary of their activity and connexion with the crisis management environment and other interesting aspects with respect to standardisation.

2.1.1 W3C

The World Wide Web Consortium (W3C) is an international consortium gathering together member organisations that work to develop standards for the Web since 1994. W3C operations are administered by a number of actors who work together, namely the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) in the USA, the European Research Consortium for Informatics and Mathematics (ERCIM) headquartered in France and Keio University in Japan. W3C also has offices around the world, including a Spanish office at Fundación CTIC, a member of the DISASTER consortium.

The most well-known standard produced by W3C is the HyperText Markup Language (HTML), the standard language for the markup of Web pages. W3C has been involved and still is in the development of the Internet Engineering Task Force (IETF) standards HTTP (Hypertext Transfer Protocol), URI (Uniform Resource Identifier), and IRI (Internationalised Resource Identifier),

which are used for addressing and transferring content on the Web. Furthermore, the W3C has produced a range of standards in areas such as accessibility, internationalisation, privacy, and Web services. Three standards that are relevant for DISASTER are the eXtensible Markup Language (XML), which is a language for exchanging (semi-)structured data; XML Schema, which is a language for describing the structure of XML documents, and RDF, a standard model for data interchange on the Web allowing structured and semi-structured data to be mixed, exposed, and shared across different applications. All three languages are frequently used in emergency and security information data exchange services.

It seems of particular interest for DISASTER the activities of the W3C in the Semantic Web field¹. The Semantic Web provides a framework that allows data to be shared and reused across application, enterprise, and community boundaries. This framework includes languages for representing and interchanging data, ontologies, etc., as the aforementioned RDF, but also the Web Ontology Language OWL², that extends RDF Schema with a number of features to make it a more expressive ontology language. It is considered the standard language for representing ontologies.

Concerning the domain of emergency management, the W3C had an interesting working group from 2005 to 2009: The Emergency Information Interoperability Framework Incubator Group³. It was later closed, but it seems that it managed to create a community of experts that could be potentially interested in developing new initiatives related to the topic.

Currently, a group of interest for the DISASTER project is the Government Linked Data Working Group⁴. We have already made contacts with them and the possible ways of collaboration are described in Section 3.1.

2.1.2 OASIS

The Organization for the Advancement of Structured Information Standards (OASIS)⁵ is a global consortium based in the United States that drives the development, convergence, and adoption of e-business and web service standards. Members of the consortium decide how and what work is undertaken through an open process.

OASIS promotes industry consensus and produces worldwide standards for several domains such as security, Cloud computing, SOA, Web services, the Smart Grid, electronic publishing, emergency management, etc.

OASIS members broadly represent both the public and the private sectors and not only technology leaders but also users and influencers. The consortium has more than 5,000 participants representing over 600 organizations and individual members in 100 countries.

As far as the topics of the DISASTER project are concerned, OASIS are responsible for the development of the Common Alerting Protocol (CAP), an XML-based data format for exchanging public warnings and emergencies between alerting technologies, or the Emergency Data Exchange Language (EDXL), suite of XML-based messaging standards that facilitate emergency informa-

¹<http://www.w3.org/sw/>

²<http://www.w3.org/OWL/>

³<http://www.w3.org/2005/Incubator/eiif/>

⁴http://www.w3.org/2011/gld/wiki/Main_Page

⁵<https://www.oasis-open.org/>

tion sharing between government entities and the full range of emergency-related organisations.

There is an OASIS Technical Committee, the Emergency Management TC⁶ whose motto is “Enabling information exchange to advance incident preparedness and response to emergency situations” that seems pertinent for the DISASTER project.

2.1.3 OGC

The Open Geospatial Consortium (OGC)⁷ is an international voluntary consensus standards organisation, originated in 1994. In the OGC, more than 400 commercial, governmental, nonprofit and research organisations worldwide collaborate in a consensus process encouraging development and implementation of open standards for geospatial content and services, GIS data processing and data sharing. The OGC Standards search for supporting interoperable solutions that make the Web more “geo-usable”.

They are responsible for the GML (Geography Markup Language), an XML-format for geographical information; KML (Keyhole Markup Language), an XML-based language schema for expressing geographic annotation and visualization on existing (or future) Web-based, two-dimensional maps and three-dimensional Earth browsers; WFS (Web Feature Service) for retrieving or altering feature descriptions; WMS (Web Map Service) to provide map images; GeoSPARQL (Geographic SPARQL Protocol and RDF Query Language) representation and querying of geospatial data for the Semantic Web; or SLD (Styled Layer Descriptor) an XML schema for describing the appearance of map layers.

To participate in OGC initiatives a membership is required.

2.1.4 Joinup

JoinUp⁸ is a new collaborative platform created by the European Commission and funded by the European Union through the Interoperability Solutions for Public Administrations (ISA)⁹ Programme. It offers a new set of services to help e-Government professionals share their experience with interoperability solutions and support them to find, choose, re-use, develop, and implement open source software and semantic interoperability assets. Joinup involves interoperability professionals from all over Europe. Professionals from other countries outside the EU are also welcome to join. Joinup offers relevant content and insight in various areas of interest, including among others:

- Cross-border and cross-sector interactions between public administrations;
- Pan-European electronic public services;
- Legal information on usage and development of open-source software within public administrations;

⁶https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=emergency

⁷<http://www.opengeospatial.org/>

⁸http://joinup.ec.europa.eu/page/about_us

⁹<http://ec.europa.eu/isa/>

- Interoperability impact of EU regulations and actions;
- Access to a repository of reusable semantic assets;
- Methodologies and practice aids on the development of semantic interoperability assets;
- Pan-European e-Government projects.

Although the Joinup platform seems more oriented to bureaucratic and administrative initiatives, in the context of the DISASTER project several administrative issues are pertinent as well as the reuse of pan-European semantic assets between partners. In addition, one of the plans of the project was to actively collaborate and share the DISASTER ontology with this platform even looking for hosting the vocabulary.

2.1.5 ISO

The International Organisation for Standardisation, known as ISO¹⁰, is an international standard-setting association composed of representatives from various national standards organisations. ISO is in fact a network of national standards bodies. These national standards bodies make up the ISO membership and they represent ISO in their country, as it is the case of the German DIN, presented in Section 2.2.1, the Danish DS, presented in Section 2.2.2, or NEN, presented in Section 2.2.3). ISO promotes worldwide proprietary, industrial, and commercial standards.

Since 1947, ISO has published over 19,000 International Standards covering almost all aspects of technology and manufacturing. ISO has members from 164 countries and 3,335 technical bodies to take care of standard development.

ISO standards are developed through a consensus process by the interested parties that need them. Experts from all over the world develop the standards that are required by their sector, reflecting that way a wealthiness of international experience and knowledge.

Related to the DISASTER topics we have identified a specific ISO 14001, dealing with emergency, preparedness and response, but the opportunities here for DISASTER could come from some efforts to collaborate with national members of the ISO consortium. In Section 3.2, we describe early contacts we have already made in that sense.

2.1.6 CEN

CEN¹¹, the European Committee for Standardisation (Comité Européen de Normalisation, Europäisches Komitee für Normung), is an international non-profit organisation set up under Belgian law. It provides a platform for the development of European Standards (ENs) and other consensus documents. CEN owns 33 European National Members working together to develop these publications in a large number of sectors to help build the European internal market in goods and services, removing barriers to trade and strengthening Europe's position in the global economy. More than 60.000 technical experts from industry, associations, public administrations, academia, and societal organisations are involved in the CEN network that reaches over 600 million people.

¹⁰www.iso.org/

¹¹<http://www.cen.eu/cen/AboutUs/WhatIsCEN/Pages/default.aspx>

The European Commission and the EFTA (European Free Trade Association) Secretariat act as CEN's Counsellors in terms of regulatory or public interest.

CEN works in a decentralised way. Its members – the National Standardisation Bodies (NSBs) of the EU and EFTA countries – operate the technical groups that draw up the standards; the CEN-CENELEC Management Centre (CCMC) in Brussels manages and coordinates this system.

A possible opportunity for DISASTER could be the CEN Workshop Agreements, that offer a possibility to create pre-standard documents for the community in a shorter time (10-12 month) than a full standardisation process.

Section 3.2 also presents early conversations about potential collaboration with CEN through a DIN working group.

2.1.7 CENELEC

CENELEC¹² is the European Committee for Electrotechnical Standardisation and is responsible for standardisation in the electrotechnical engineering field. CENELEC prepares voluntary standards, which help facilitate trade between countries, create new markets, cut compliance costs and support the development of a Single European Market.

CENELEC creates market access at European level but also at international level, adopting international standards wherever possible, through its close collaboration with the International Electrotechnical Commission (IEC), under the Dresden Agreement.

In an ever more global economy, CENELEC fosters innovation and competitiveness, making technology available industry-wide through the production of voluntary standards.

Through the work of its members together with its experts, the industry federations and consumers, European Standards are created in order to encourage technological development, to ensure interoperability and to guarantee the safety and health of consumers and provide environmental protection.

Designated as a European Standards Organisation by the European Commission, CENELEC is a non-profit technical organisation set up under Belgian law. It was created in 1973 as a result of the merger of two previous European organisations: CENELCOM and CENEL. But Although CENELEC works closely with the European Union, it is not an EU institution.

2.2 National organisations

This section is devoted only to national organisations. It includes a high-level summary of their activity with interesting standardisation initiatives at a national level, providing also their connexion from national to international level as members of the ISO consortium.

¹²<http://www.cenelec.eu/aboutcenelec/whoweare/index.html>

2.2.1 DIN

Deutsches Institut für Normung (DIN; in English, the German Institute for Standardisation)¹³ is the German national organisation for standardisation and is Germany ISO member body. DIN is a non-governmental organisation recognised by the German government as the national standards body and represents German interests at international and European level.

DIN Standards promote rationalisation, quality assurance, safety, and environmental protection as well as improving communication between industry, technology, science, government and the public domain. The standardisation works are carried out by 26,000 external experts serving as voluntary delegates in more than 4,000 committees. Draft standards are submitted and available for public comment, and all comments are reviewed before final publication of the standard. Published standards are reviewed for continuing relevance every five years, at least.

The over 12,000 DIN standards cover a wide range of topics including: physical quantities and units, fasteners, water analysis, building and civil engineering (including building materials, construction contract procedures (VOB), soil testing, corrosion protection of steel structures), materials testing (testing machines, plastics, rubber, petroleum products, semiconductors), steel pipes, machine tools, twist drills, roller and ball bearings, and process engineering. DIN Handbooks (covering subjects such as mechanical engineering, fasteners, steel, welding, etc.). Most DIN standards are available in English versions, or in English translations.

Standards are produced in collaboration with all interested entities on request of a specific entity or group, and it demands consensus among the collaborating entities.

2.2.2 DS

Danish Standards¹⁴ is a private independent organisation whose profits are reinvested into the development of new activities for the benefit of society and the corporate sector. Their primary fields of activity include standardisation, consultancy, sale of standards and handbooks, courses and conferences and ecolabelling. DS is Denmark representant in the ISO organisation.

They offer certification through their subsidiary DS Certificering A/S. Within their core activity standardisation, Danish Standards concludes a performance contract with the Ministry for Economic and Business Affairs.

2.2.3 NEN

The Netherlands Standardisation Institute (NEN)¹⁵ is a private, non-profit organisation. It operates since 1916, when it was set up by the Netherlands Society for Industry and Trade, in cooperation with the Royal Institute of Engineers. It is that country's ISO member body.

NEN searches for assuring an active involvement of the trade and industry sectors in the Netherlands in the development of international, European standards and also of national standards. It also promotes the use of standards and standardisation within the Netherlands, being that country's

¹³<http://www.din.de/cmd?level=tpl-home&languageid=en>

¹⁴www.ds.dk/en/

¹⁵<http://www.nen.nl/>

ISO member body and so the organisation to be contacted there for information on standards and standards development.

The NEN bureau is an integrated organisation that works together with both the Netherlands Standardisation Institute and the Netherlands Electrotechnical Committee.

2.2.4 GEONOVUM

Geonovum¹⁶ is the National Spatial Data Infrastructure (NSDI) executive committee in the Netherlands. The organisation devotes itself to providing better access to geo-information in the public sector. Geonovum develops and manages the geo-standards needed to implement this goal, connecting public sector managers with the workfloor professionals, making possible the national geoinformation infrastructure.

Geonovum is a small and flexible organisation whose activities are subsidised by the Ministries of Infrastructure and Environment (IenM), Economy, Agriculture and Innovation (EL&I), the land registry (Kadaster) and TNO.

Geonovum's main goals are to develop and standardise the geo-information infrastructure while also being innovative; to build up and disseminate knowledge in the area of geo-information infrastructure; to make the geo-information infrastructure more accessible to administrative bodies, institutions and departments in the Netherlands and the European Union. In order to reach its goals Geonovum devotes itself to the following labours:

- to share and make accessible all the geo-information available in the Netherlands;
- to be a think tank in the domain of geo-information;
- to be the 'voice of geo-information' that provides the minister of I&M and the Council for Geo-information with professional advice and relevant knowledge.
- to develop high-quality and widely applicable standards and to monitor their use.

The tasks focus in particular on developing and controlling standards, making up-to-date geo-information accessible, developing knowledge and giving advice to the Council for Geo-information on technology and implementation aspects. Geonovum does not carry out all its tasks itself but calls in third-party help where needed.

2.3 Other organisations or initiatives

Regarding standardisation, there are also other initiatives, both in the national level and in the European one, that if they do not have room in the main sections of this deliverable they are worth mentioning and deserve some attention.

In Denmark there is a government firm called KMS¹⁷ (Kort & Matrikelstyrelsen; in English, National Survey and Cadastre) that is looking for standardisation initiatives on GIS information. It

¹⁶<http://www.geonovum.nl/>

¹⁷<http://www.kms.dk/English/>

seems they have not yet developed a working group for the moment, but it could be interesting to monitor them having in mind second developments of this deliverable.

The GMES Emergency Management Service¹⁸ is a set of services funded by the European Commission. They started operations on April 1st, 2012 and their services are aimed at providing actors in the management of natural and man-made disasters, in particular Civil Protection Authorities and Humanitarian Aid actors with mapping products based on satellite imagery (EMS - Mapping).

¹⁸<http://portal.ems-gmes.eu/>

Chapter 3

Standardisation efforts

3.1 Efforts related to the W3C and the JoinUp platform

One of the DISASTER project results will be the creation of the ontology EMERGEL (Emergency Elements). In this context, the DISASTER project has already made initial contacts with the W3C consortium, in particular with the Government Linked Data Working Group¹, to draw attention from the community and having in mind that the aim of EMERGEL is to go beyond to the DISASTER project life and to reach a standard-like condition. In this Working Group, there is also presence from the European JoinUp initiative (see Section 2.1.4), a platform caring about the standardisation of open vocabularies and models, and open source software within the European Union. The first reaction has been positive, although it may take some time to formalise the relationship and agree about the publication procedure of the DISASTER ontology, EMERGEL.

EMERGEL has been already conceived to be aligned with some of the upper-level government-ground vocabularies designed by the W3C consortium and the JoinUP platform. These vocabularies play two roles with respect to EMERGEL. On the one hand, they allow EMERGEL to incorporate into a general description framework of standardise vocabularies at the European (even international) level. On the other hand, their top-level structure enables domain-specific classifications and vocabularies (vertical modules) to be connected and integrated in the single semantic space of EMERGEL. These vocabularies are the following:

- RADion (Repository Asset Distribution)²: a high-level vocabulary intended to facilitate the federation and co-operation of semantic assets repositories. It aims to act as a common layer among repositories that want to exchange data.
- DCAT (Data Catalog Vocabulary)³: an RDF Schema vocabulary for metadata about structured data resources, such as datasets or catalogs.
- ADMS (Asset Description Metadata Schema)⁴: is an OWL vocabulary to describe semantic assets and their repositories. It has been specially designed to favour SKOS taxonomies and

¹http://www.w3.org/2011/gld/wiki/Main_Page

²<http://www.w3.org/ns/radion>

³<http://www.w3.org/TR/vocab-dcat/>

⁴<http://www.w3.org/ns/adms>

classifications reuse.

It is worth noting that EMERGEL embracing of these initiatives permits it to be a consortium-open product, leaving the door open to and welcoming future third-party extensions and contributions.

However, while we negotiate the incorporation of EMERGEL to that framework, the early version of the ontology will keep a namespace that has been registered at PURL, a service providing Web addresses that act as permanent identifiers in the face of a dynamic and changing Web infrastructure. This allows the underlying Web address of resources to change over time without negatively affecting systems that depend on them. A PURL namespace was registered as <http://purl.org/emergel>. The ontology will be hosted by CTIC in <http://vocab.ctic.es> and will be published according to W3C best practices⁵.

3.2 Other standardisation efforts

Another possible collaboration initiative regarding standardisation could be with DIN's (see Section 2.2.1) SPEC 91287⁶ development group, interested in collaboration and working on international interoperability standards for EMS data exchange.

During a national/EU security research conference in Brussels, one of the DISASTER project partners, antwortING, made some contacts with people responsible for the DIN SPEC and obtained some feedback and predisposition for cooperating. It was suggested to use the CEN (see Section 2.1.6) Workshop Agreement for standardisation activities in EU research projects.

⁵<http://www.w3.org/TR/2008/WD-swbp-vocab-pub-20080123/>

⁶<http://www.spec.din.de/cmd?level=tpl-art-detailansicht&committeeid=0&artid=152988042&bcrumblevel=2&languageid=de>