In this third ORCHESTRA Newsletter we focus on the four active ORCHESTRA pilots, and provide updates on the progress of our activities.

The next Newsletter will be devoted to exploitation aspects and collaborations with other projects and initiatives.

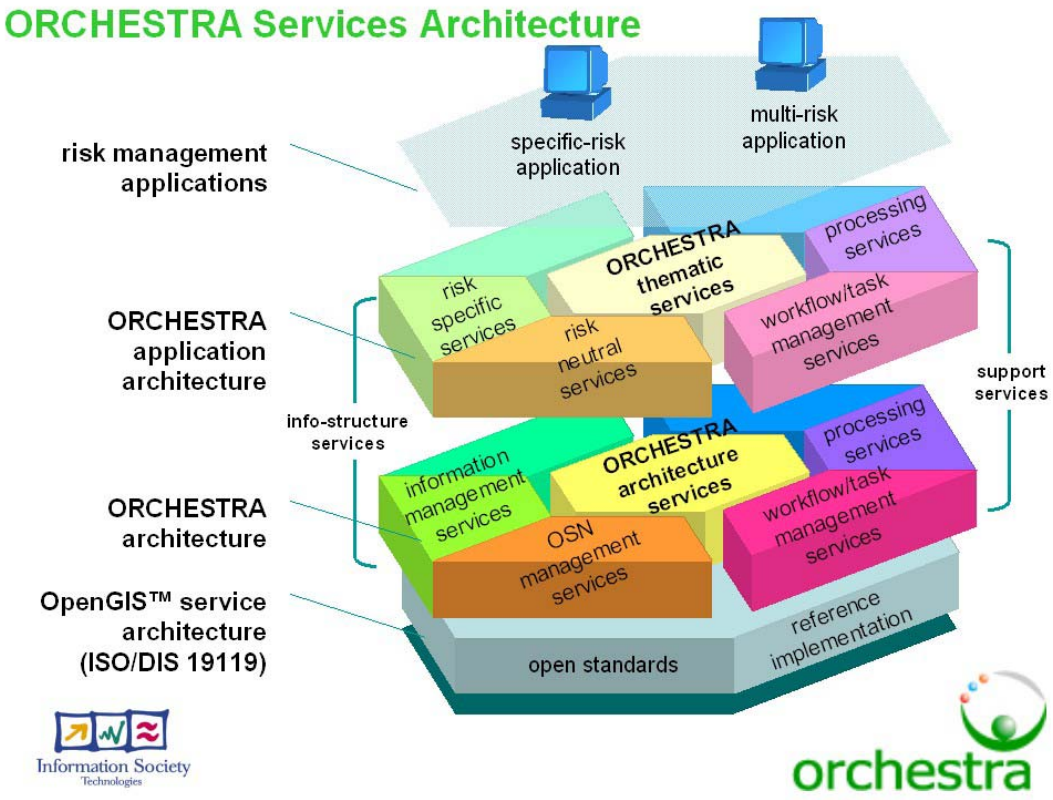
Why ORCHESTRA?

In order to enable interoperability at a European level among all actors involved in risk management activities, ORCHESTRA has two main goals to fulfill:

- To design and develop an open service architecture for risk management based on de-facto and de-jure standards.
- To develop the necessary services to demonstrate the usefulness of the approach in pilots that address the needs of end-users and stakeholders involved in risk management activities in real-world scenarios.

The ORCHESTRA Approach

The following diagram depicts the ORCHESTRA approach to risk management services:



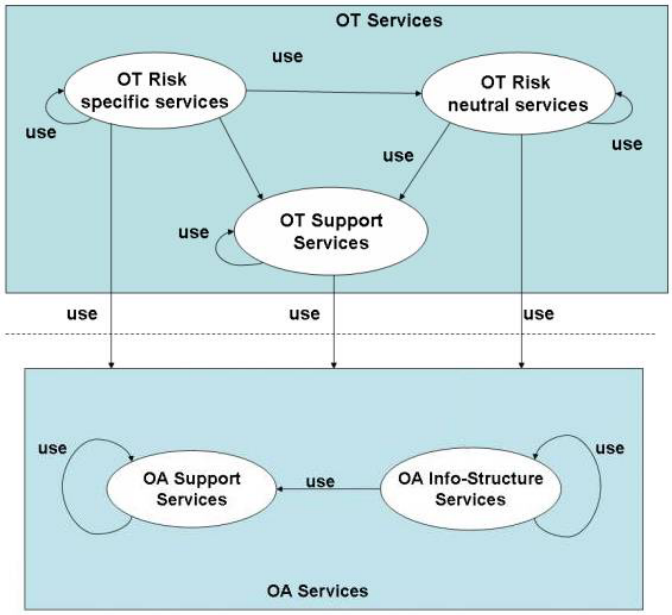
The ORCHESTRA Architecture

After the first year of work, the main public deliverable has been the Reference Model for the ORCHESTRA Architecture (RM-OA), which contains a specification framework for the design of ORCHESTRA-compliant service networks and provides a platform-neutral specification. The document can be downloaded from http://www.eu-orchestra.org/documents.shtml.

The ORCHESTRA consortium has submitted the RM-OA to the Open Geospatial Consortium (OGC, http://www.opengeospatial.org/) for consideration, as an initial step for contribution to existing standards. In addition, the RM-OA has been sent to other projects, initiatives and institutions, in order to raise awareness of our efforts and gather relevant feedback that can be taken into consideration in further updates and releases of the document.

Once the ORCHESTRA Architecture had been defined in a platform-neutral way, the consortium decided to implement it as the ORCHESTRA Web Services Platform, adopting the W3C Web Services Architecture as a basis.

ORCHESTRA Services have been classified in two categories: ORCHESTRA Architecture (OA) Services and ORCHESTRA Thematic (OT) Services. OA Services are those that provide a generic, platform-neutral and application domain-independent functionality, while OT Services provide application domain-specific functionality, built on top of and using OA Services and/or other OT Services. This ensures that ORCHESTRA-compliant applications can be built for a wide range of risk management domains.



OA Service Categories with an example of OT sub-categories in the Environmental Risk Management domain

OA Info-Structure Services are those required to operate an OSN (ORCHESTRA Service Network) in the sense that these services play an indispensable role. Representatives are Feature Access Services (for maps, documents, source systems, ontologies), Catalogue Service(s), (service) Monitoring Services, Control services (like User Management, Authorization and Authentication), services for facilitating semantic queries (Query Mediation Service). OA Support Services facilitate the operation of an OSN, e.g. providing an added value by combining the usage of OA Info-Structure Services. Representatives are several services for generation of meta-information (Annotation Service is one of these) or those related to geographic information (Coordinate Operation Service, Gazetteer Service).

OT Support services facilitate the development of thematic functionality such as the processing of statistical data, workflow and task management (e.g. Project Management Support Service or Reporting Service). OT Risk-specific Services are specific to a risk management domain (e.g. floods, forest fires, earthquakes) facilitating risk management functionality.

End users will be using such ORCHESTRA-compliant applications, built as a combination of different underlying OA and OT Services.

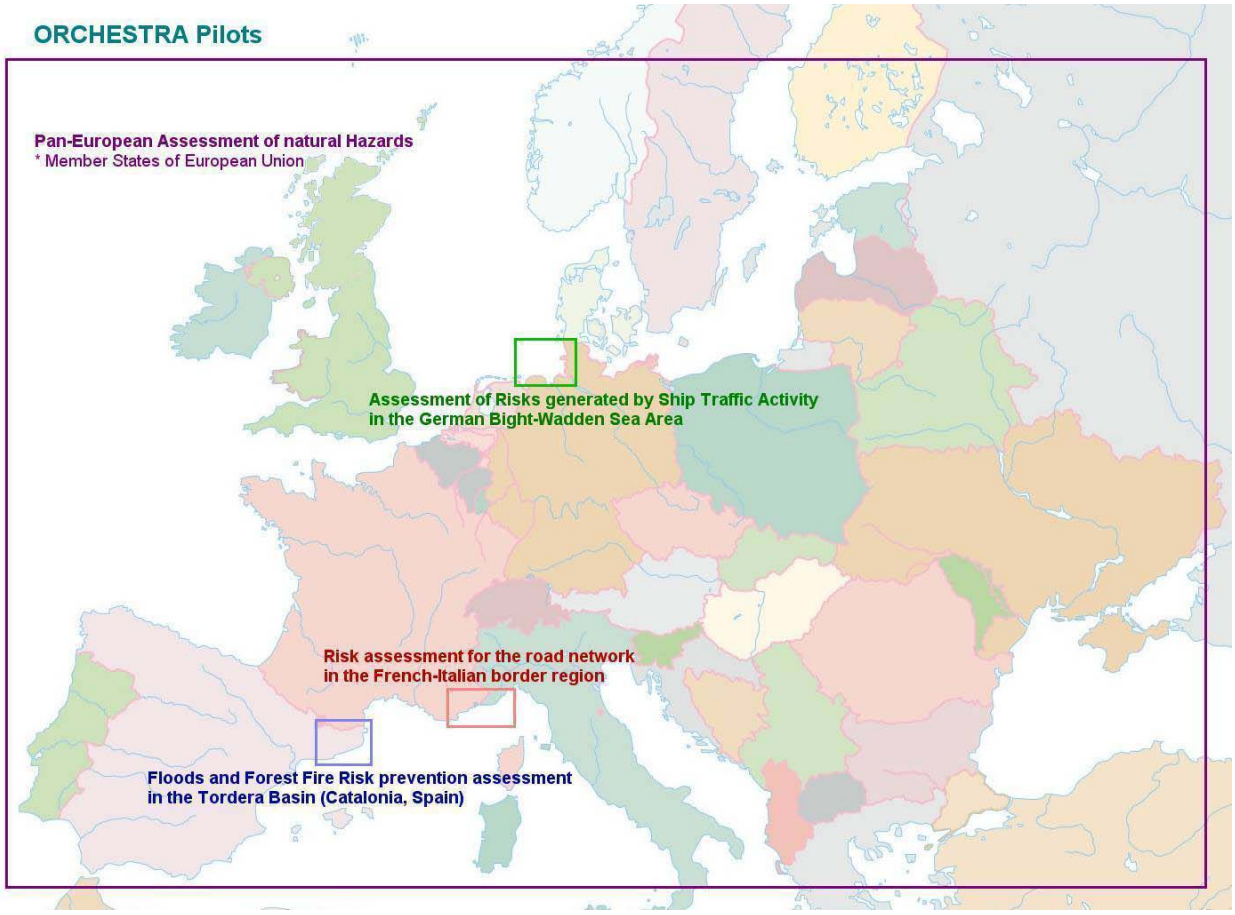
The ORCHESTRA Pilots

In order to demonstrate the validity of the ORCHESTRA approach, we are committed to carrying out pilot implementations for real-world risk management scenarios. The initial plan was to have at least one pilot that covered the major challenges in risk management: cross-border scope, multilingual nature, multi-risk scenario, integration of spatial and non-spatial information, relevant to INSPIRE and containing semantic interoperability aspects.

The interest raised by ORCHESTRA among institutions not belonging to the project, the impulse of the project partners and careful financial planning, have made it possible for us to launch four different ORCHESTRA pilots, all of which address, from different perspectives, the challenges mentioned above.

The 4 ORCHESTRA pilots are:

1. Pan-European assessment of natural hazards.
2. Forest fire and flash flood risk assessment in the Tordera basin (Catalonia, Spain).
3. Assessment of the effects of road network disruptions due to multiple risks in the French-Italian border region.
4. Assessment of risks from heavy ship traffic in the German Bight area (Wadden Sea).



Geographical distribution for the 4 ORCHESTRA pilots

The ORCHESTRA pilots are the focus of Sub-Project 4, lead by Atos Origin. This Sub-Project also comprises those activities that encompass common aspects across all pilots.

Pilot 1 - Pan-European Assessment of Natural Hazards

This pilot is led by the Institute for Environment & Sustainability of the Joint Research Centre (JRC-IES).

Its main objective is to help decision makers in the European Commission to more efficiently integrate the information coming from the Member States, and to do so in an interoperable and interactive manner.

Users will be able to:

- analyse forest fire hazards in the EU Member States in order to support forest fire policies and fire prevention,
- assess the damage caused by floods within the EU Member States, according to different scenarios for hazard magnitudes, and
- assess the effects of various hazards (e.g., floods, droughts, and forest fires) within the EU Member States.

These users comprise:

- experts that conduct policy support towards various EC DG's in the context of forest fires and flooding (JRC Actions INFOREST and WDNH),
- decision makers within the supported EC DG's (ENV, REGIO).

In the future it is planned to extend the use of the applications to national decision makers and stakeholders, if possible.

The key technical aspects addressed are:

- Schema mapping from heterogeneous national data sources (spatial & non spatial data) into a common pan-European model (addressing semantic interoperability).
- Distributed geo-processing to support ad-hoc analysis focussing on spatial decision support.
- Support interactive web-based assessment of hazards, risks and potential damage.
- Defining and using ontologies to derive schema mappings and to describe processing tasks.

Pilot 2 - Forest fire and flash flood risk assessment in the Tordera basin (Catalonia, Spain)

This pilot is led by TYPSA.

Its main objective is to improve the context of decision-making processes in the prevention planning of various risks (flash floods and forest fires) in a river basin by focusing on the efficiency of information management and assessment services, improving the interoperability among the involved actors and systems.

Users will be able to:

- efficiently query and access the most appropriate information sources to feed the prevention planning processes (services),
- model various risks in a consistent and collaborative way, efficiently linking such models and procedures in chained simulations of multi-risk scenarios (what-if cases),
- set-up (co-ordinate) and open appropriate and efficient communication channels among vertical (administration levels) and horizontal (thematic administrations) levels, to ensure that the required information reaches all actors in all decision-making process steps,
- homogenise territorial planning, through the integration of Civil Protection, Urban Development and Environment Administrations, in order to preview future scenarios of risk management and land use.

These users comprise:

- During the first phase, Agència Catalana de l'Aigua (Catalan Water Management Agency) and Institut Cartogràfic de Catalunya (Catalan Cartographic Institute).
- Later: Comissió de Protecció Civil General (Civil Protection), Direcció General d'Urbanisme (Urban Development DG), Servei Meteorològic de Catalunya (Catalan Meteorology Service), Direcció General del Medi Natural (Environment DG), and Centre de Recerca Ecològica i Aplicacions Forestals (Forestry and Environment Research Centre).

The key technical aspects addressed are:

- Flash flood and forest fire simulations, and their interaction (effects of altered vegetation and soil).
- Calculation of risk-specific, common and differential risk maps.
- Joint elaboration and management of vulnerability rules, protocols and action lists.
- Schema mapping and use of ontologies.

Pilot 3 - Assessment of the effects of road network disruptions due to multiple risks in the French-Italian border region

This pilot is led by BRGM.

Its main objective is to assess the effects of disruptions to road networks due to diverse risks, such as landslides, earthquakes, floods, forest fires, etc. Road transport plays an important role in the economic, functional and social life of a region. For example, roads enable the transport of commodities from their source (e.g. a factory) to the distribution centre (e.g. a shop) and the consumers from their homes to the distribution centre. Therefore, disruptions of roads can have a dramatic impact and lead to extra costs, inconvenience and (within the post-event phase of the disaster cycle) difficulties in accessing affected communities.

Users will be able to:

- simulate events leading to road blockage or disruption,
- calculate estimated traffic, alternative routes and their level of traffic,
- estimate additional costs (time and money) caused by the disruption, and the subsequent GDP losses for the affected region,
- run these simulations to identify pinch points within the road network and improve planning and prevention.

These users comprise:

- experts within the Piedmont and Liguria regions,
- transport and toll motorway companies,
- national and regional administrations.

The key technical aspects addressed are:

- access to diverse data sources.
- risk assessment from multiple hazards.
- use of semantics (ontologies) for efficient multilingual and cross-organisational database querying.

Pilot 4 - Assessment of risks originated by heavy ship traffic in the German Bight area (Wadden Sea)

This pilot is led by BMT Cordah Limited.

Its main objective is to provide users and stakeholders (operators and regulators) with information and tools for monitoring and quantifying the impact of ship traffic activity with respect to antifoulant pollution, spills of harmful substances, and other environmental risks in the German Bight region.

Users will be able to:

- analyse the effects of a particular modelled or measured spatial pollutant,
- manage ship traffic activity and assess the induced pollution and impact on the coastal environment,
- manage the impact of coastal dredging programmes on the coastal environment,
- determine the risks associated with an operational or accidental ballast water discharge, and
- determine the best area for an aquaculture site development.

These users comprise:

- End users: Trilateral Wadden Sea Cooperation; Umweltbundesamt (UBA); Bundesamt für Seeschifffahrt u. Hydrographie (BSH); Bundesamt für Naturschutz; Schleswig-Hostein Ministerium für Landwirtschaft, Umwelt und ländliche Räume; Brockmann-Consult; GKSS-Forschungszentrum Geesthacht GmbH.
- Stakeholders: fish farming industries, shipping industry, government regulatory authorities, various research and educational organisations and consultants.

The key technical aspects addressed are:

- Access to and integration of diverse data and information sources from three EU Member States.
- Use of semantics (ontologies) for efficient multilingual and cross-organisational database querying.
- Improvement of multilateral risk management, supporting an interactive and consensual development of cross-border risk management processes.
- Providing a flexible platform to manage multiple risks, associated with shipping or other coastal industrial operations.

The timeline for ORCHESTRA pilots

Work on the ORCHESTRA pilots started in late 2005, and they were completely defined by March 2006. Since then, project partners and the involved end users are working closely together in order to develop and deploy the applications that will then be validated.

This work has involved the identification and refinement of the OA and OT services that will compose such application, their specification and development, and their testing prior to on-site deployment.

The ORCHESTRA pilots will be executed in 3 phases:

- Until October or November 2006, we will focus on the development and deployment of the first versions of services and applications, on the access to and integration of relevant information sources, on the establishment of efficient collaboration among the actors involved, and on gathering information for the later deployment of more advanced aspects (such as semantics).
- From that point until March 2007, we will deploy advanced versions of the services and applications, start assessing the improvement of collaborations, and start the use of advanced aspects.
- From April until August 2007 (end of the project), we will refine the applications (if necessary), focus on the use semantics and other advanced technologies, and carry out fully collaborative tasks among involved actors, and finally validate the pilots.

ORCHESTRA intends to leave the deployed services and applications running in each of the pilot sites, so they can continue to be used after the project ends.

Meet ORCHESTRA

In the next few months we will be attending events such as:

IDRC Davos 2006. International Disaster Reduction Conference
August 27–September 1, 2006. Davos, Switzerland
http://www.davos2006.ch/

1st ECEES. First European Conference on Earthquake Engineering and Seismology
September 3-8, 2006. Geneva, Switzerland
http://www.ecees.org/

EnviroInfo 2006
September 6-8, 2006. Graz, Austria
http://enviroinfo.know-center.tugraz.at/

Terra Future 2006 (Ordnance Survey)
September 19th 2006, Ordnance Survey, Southampton, UK
http://www.ordnancesurvey.co.uk/oswebsite/partnerships/research/terrafuture/

AM/FM GIS Italia 2006
September 21-22, 2006. Rome, Italy
http://www.amfm.it/

IST 2006
November 21-23, 2006. Helsinki, Finland
http://europa.eu.int/information_society/istevent/2006/index_en.htm
http://www.ist2006.fi/

In addition, we are planning the organisation of a few workshops jointly with other projects working in related themes. In the next newsletters we will provide further information about these workshops, as well as future events we will be attending.

Do you want to know more about ORCHESTRA?

You may check our project website:
http://www.eu-orchestra.org

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