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SERIES

SEISMIC ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES

User manual of Distributed Database and of Data Access Portal

February, 2012

ABSTRACT

The Data Access Portal is developed following a user-centered iterative design cycle aiming to provide useful and usable services related to information retrieval functionalities to a wide range of stakeholders, organizations and individuals. The objective of this document is to provide an overview of the 2nd version of the SERIES Data Access Portal

Keywords: Data Access Portal, Series Distributed Database, User Manual

ACKNOWLEDGMENTS

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1 User Manual of the Data Access Portal

The aim of the SERIES Data Access Portal (DAP) is to provide a centralized way for accessing all the public projects from the SERIES community. The Data Access Portal presents the information of the available projects by following the structure of the Exchange Data Format (Deliverable 2.1) and having a basic understanding of EDF (see as well section 1.1.2) is considered **useful** for understanding how the Data Access Portal is structured. The Data Access Portal provides a brief description related to the Exchange Data Format.

Conceptual Design of the Data Access Portal

From a conceptual point of view the Data Access Portal has been designed to act as an information space. Organizing functionality and content into a structure that users are able to navigate intuitively is not a trivial task. Researching the suitable Information Architecture of the DAP environment is of great importance. Effective information architecture enables users to step logically through a system aiming to supporting them getting closer to the information they require. Lacking a suitable Information flow increases the risk of creating great content and functionality that no one can ever find. The proposed Information Architecture is based on the fact that the content is not going to be created by a group of administrators or content authors. The content will be mostly fed into the system by the distributed databases that are maintained on the laboratories sides. However, the distributive character of the database makes the decision of the suitable information containers much more difficult. Two questions are the most prominent in this decision process:

- What is important and for whom?
- What has to be accessible and for whom?

The Information Architecture of the system needs to provide rational answers to these questions satisfying the majority of – if not all – users. The proposed platform uses a “Pull” (or self-subscribe) rather than a “Push” model for the Information flow and the Notification system, in

order to fulfil the above statement. That means, that each user selects what is important for him and thus reaches it with less effort ("Push" functionality regarding the notification of users could be available, but that does not reflect the general philosophy of the platform).

In terms of user interaction functionalities the Data Access Portal supports two complementary modes of information retrieval: a) direct search functionality (see as well section 1.2) and b) direct navigation functionalities (see as well section 1.3) which are explained further in the Data Access Portal overview section .

1.1.1 External Actors

From an architectural point of view, the Data Access Portal has been designed to support two different external actors:

- The external users who will interact with the SERIES web portal in order to perform information retrieval tasks and
- The Laboratory Web Services, which will interact with the Central Site (more specifically with the Central Web Service) in order to exchange content and configuration. The security model which will be used among the Web Services for their communication has been described in previous deliverables.

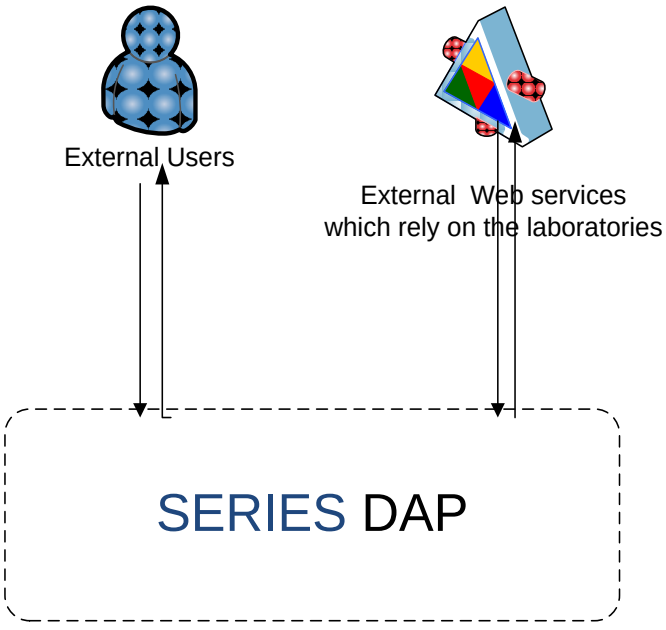

Figure 1: External Actors of the SERIES Central Site

From a software component point of view, as shown in Figures 2 and 3, the Data Access Portal consists of the following components:

- the SERIES distributed database, which entails the searchable part of the published projects (an overview of the Entity Relation Diagram is shown in Appendix A)
- the SERIES central web services, which communicate with the laboratories in order to exchange information on published projects but as well configuration settings related to privacy issues (an example of some Web Services are shown in Appendix A)
- the SERIES web server, which also hosts the Data Access Portal which is described in this deliverable

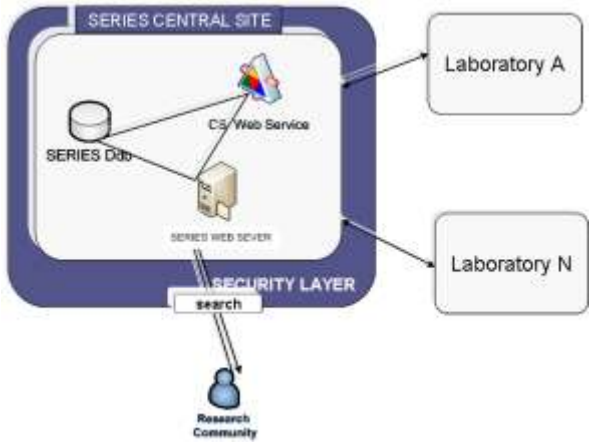

Figure 2: Component View of the SERIES Central Site

A more detailed component view, which entails as well the software components relying on the laboratory side, can be seen in Figure 3.

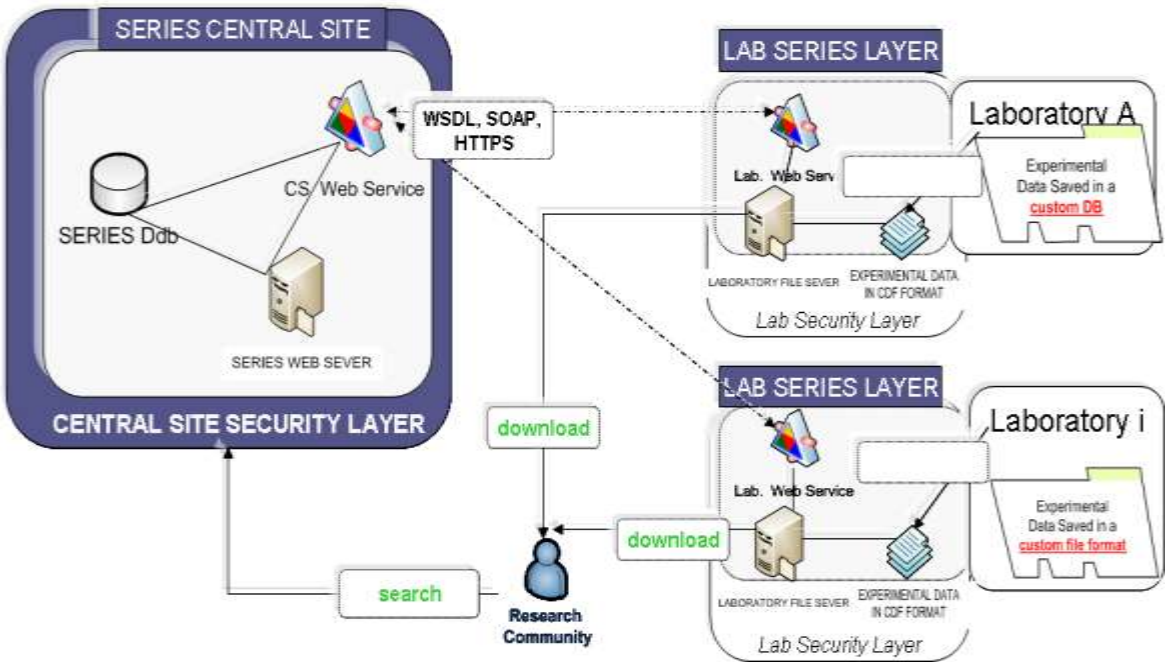

Figure 3: Component View of the SERIES and Laboratories Site

1.1.2 SERIES Projects Types and Exchange Data Format

The European scientific community is currently fragmented with each laboratory holding experimental data with a unique local data model and user interface, language and scheme. As a consequence, the dissemination and use of these experimental results outside of the laboratory where they are produced can be problematic. To overcome this, it is proposed to add a layer on top of the existing local databases that is accessible through a unique Data Access Portal. The aim is not to build a central database where local databases either migrate or merge but instead to provide centralised access to database nodes that are distributed over the network which are able to dialog with a central portal in a uniform manner.

In this context two district types of projects are supported: a) public and b) partner projects. These supported types are distinguished based on the privacy level they utilize. The public projects are available to any visitor of the Data Access Portal whereas the Partner projects are available only to the member of the SERIES consortium.

The Data Access Portal presents information related to published projects according to the Data Exchange Format. According to the Exchange Data Format a published project, in the frame of the SERIES community, embrace information organized on several levels of abstraction (i.e. specimen level, experiment level, computation level and signal level). As shown in figure 5, each specimen consists of information related to the specimen, the experiment and the computation level, whereas, each experiment or computation embraces as well information related to the signal level.

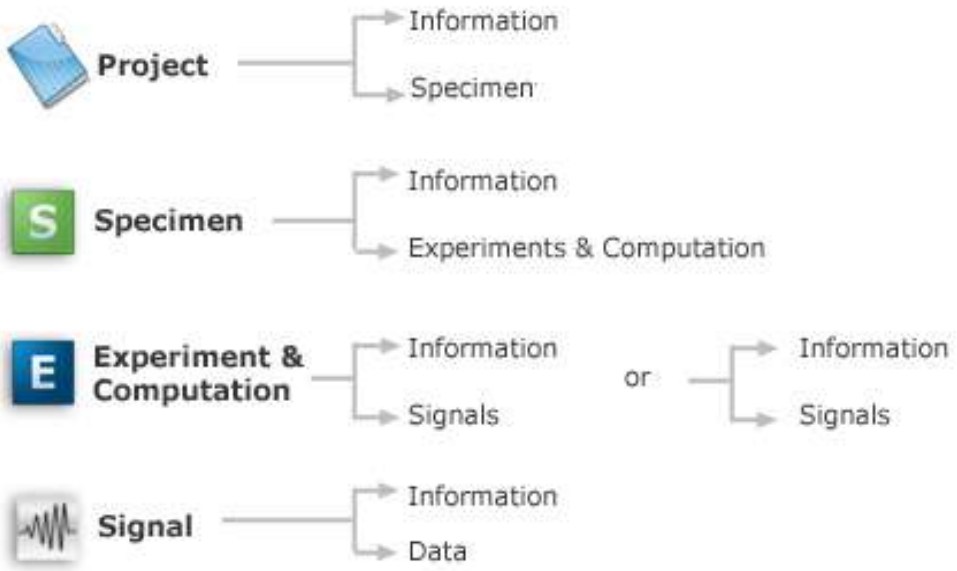

Figure 4: Exchange Data Format

A detailed presentation of the Exchange Data Format is presented in the deliverable D2.1 and is available through the entry page of the Data Access Portal.

Direct Navigation Functionalities

In Figure 1, the home page of the Data Access Portal is shown which is divided into two main panels, the left panel which contains all the available projects and the right panel which provides general information related to the Data Access Portal, project specific information and also the search functionality.

Figure 5: The Main Information Presentation Areas

In this context, the right pane of the DAP provides information related to:

- The general purpose of the Data Access Portal and its mission and vision which is the creation of the distributed database aims to improve the dissemination and use of experimental results and to foster the impact of earthquake engineering research on practice, innovation and earthquake risk mitigation.
- The Exchange Data Format: A small introduction about the Exchange Data Format and a direct link to the whole specification and detailed analysis of the Exchange Data Format. An understanding of the EDF format is considered useful in order to understand in short time the structure of the published projects on the Data Access Portal
- Information related to the last published project: The title and a small description of the last published project
- The user manual: The user manual of the Data Access Portal which is the current document and is accessible through the central page of the Data Access Portal

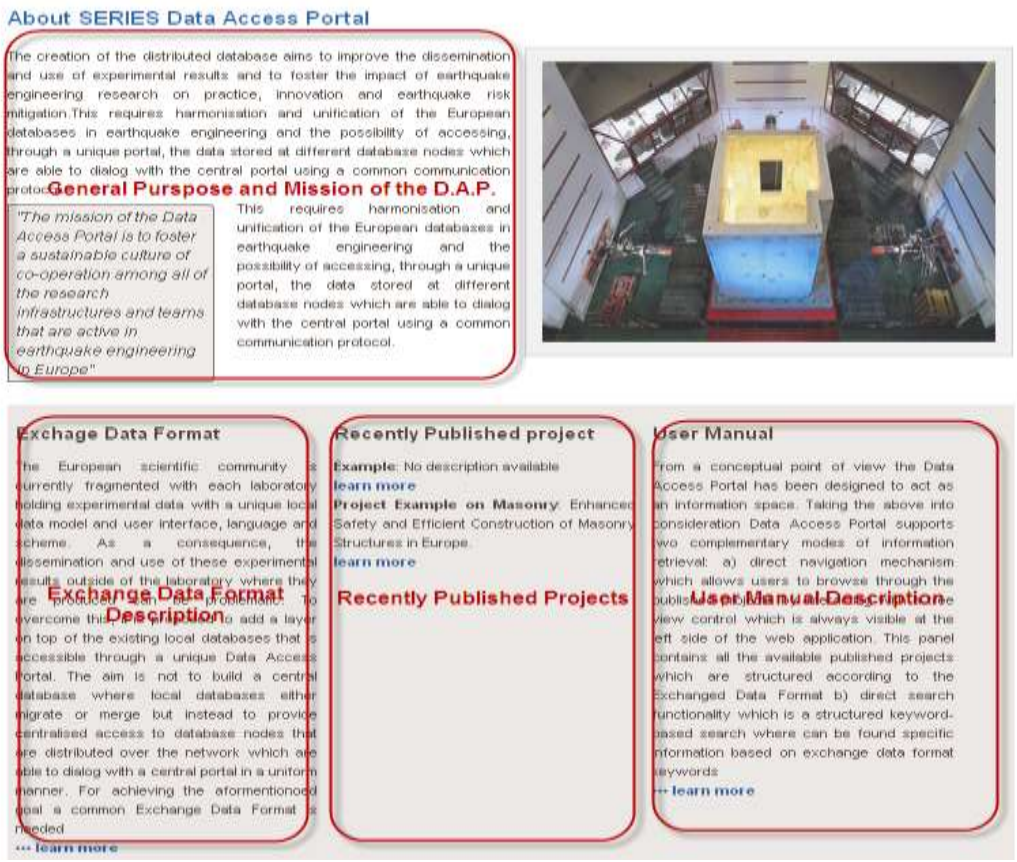

Figure 6: Right Pane

1.1.3 Projects Ordering Options

Aiming to adapt content presentation according to users individual needs the Data Access Portal implements multiple data presentation features implemented through visual direct manipulation control. As it can be seen in figure 6, the tree view control can be structured with three (3) different ways using the ***"PROJECTS ORDER BY"*** list box:

- ***"Project Creation Date"***: Through this selection the projects are ordered according to their Creation Date which is also the default selected value
- ***"Project Name"***: Through this selection the projects are ordered alphabetically according to their Project Name
- ***"Laboratory Name"***: Through this selection the projects are ordered according to the laboratory they belong to. In such case, the laboratory names are displayed on the left pane of the Data Access Portal along with the project information.

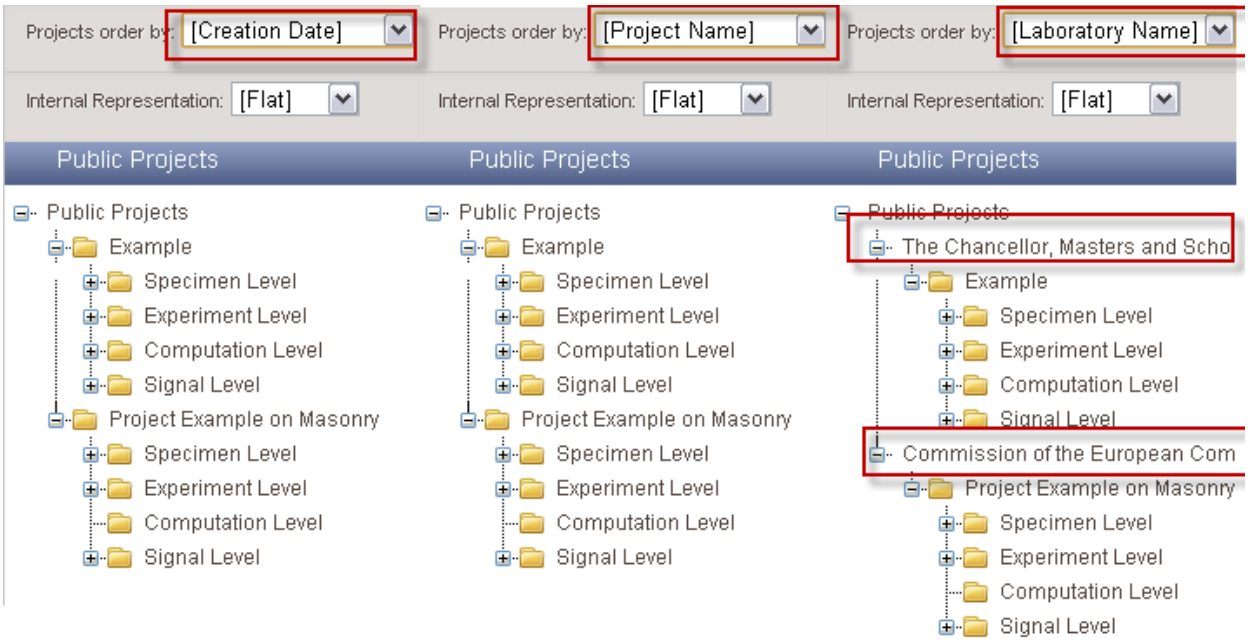

Figure 7: Projects Ordered by List and its effect on the Tree View

1.1.4 Project Internal Representation Options

Furthermore, having the aim to provide bootstrapped functionalities to diverse user groups the Data Access Portal offers two complementary ways of presenting information of available projects. These diverse information representation modes ("***Flat"*** and "***Layers"***) are available through the ***"INTENAL REPRESENTATION"*** list box.

As it is shown in Figure 7, the flat option keeps all the levels visible under one level:

- ***"Specimen Level"***: The specimens that a project contains are visible under the specimen level. Even though a specimen may have experiments and computations these are not visible in the specimen level, but in the next level.
- ***"Experiment Level***": All the available experiments are shown here. Experiments are presented under the specimen they belong to. Specimen that doesn't have experiments are not **included** here.
- ***"Computation Level***": All the available computations are shown here. Computations are presented under the specimen they belong to. Specimens that doesn't have computations are not **shown** here.

- ***"Signal Level"***: All the available signals are presented in this level. The Signals are connected to the experiment or computation they belong to.

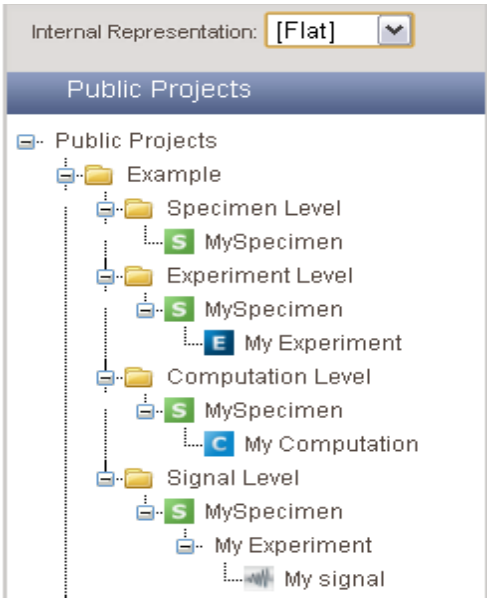

Figure 8: Flat Internal Representation

As it is shown in Figure 8, the ***"Layer"*** option is an exact representation of the Exchange Data Format therefore underlying levels are represented in a hierarchical way.

- ***"Specimen Level"***: The specimens that a project contains are visible under the specimen level. Expanding a specimen, the "Experiment Level" and "Computation Level" are available. Further expanding the "Experiment" or "Computation" level the "Signal" are presented.
- ***"Experiment Level***": The experiments that are contained into each specimen are visible in this level.
- ***"Computation Level***": The computations are presented under the specimen they belong to.
- ***"Signal Level"***: Expanding a computation or an experiment all the available signals that belong to are presented in this level. Signals like the experiments and computations are connected to the experiment or computation they belong to.

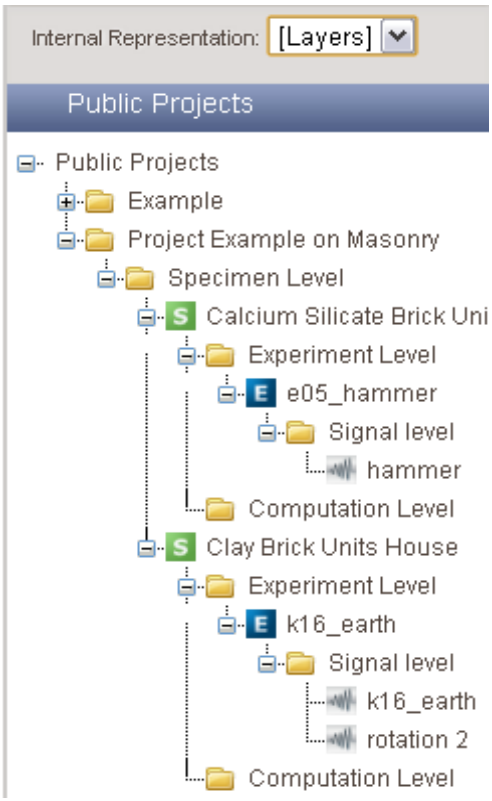

Figure 9: Layers Internal Representation

1.1.5 Project General Info Tab

Whenever a node from the tree structure is clicked the right pane is loading the following information:

"Project General Info": General information regarding the project is displayed here which includes:

- Project Info: project start date, project end date, sponsor of the project, acronym of the project and a small description about the project
- Investigators info: investigator name, investigator role, institution acronym, institution name
- Infrastructure info: location name and resource name

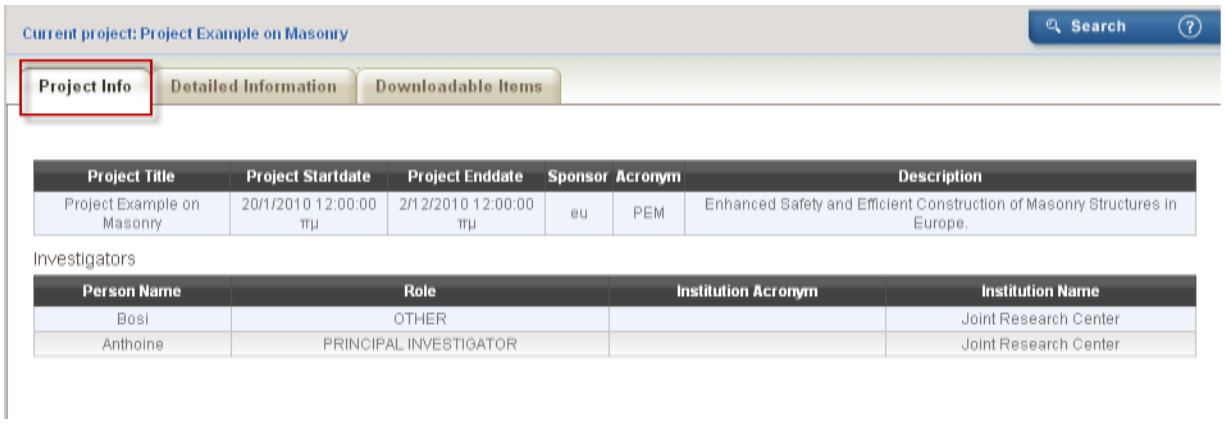

Figure 10: Project Information Tab

1.1.6 Project Detailed Info Tab

***"Detailed Information"*:** Detailed information tab provides information about the node that has been clicked by a user on the tree view. Information is presented in alias with the Exchange Data Format levels:

Project Level

- Project general data: Project Title, Project Acronym, Project Sponsor, Project Main Focus, Project Summary, Project Start Date, Project End date, Project Status
- Project Investigator
- Project Infrastructure
- Project Documents

Specimen Level

The information included in the specimen level, as depicted in Figure 9, is related to the following:

- Specimen data
- Structural elements
- Structural element material
- Material nominal properties
- Material actual properties

- Specimen documents
- Specimen images
- Scaling

Figure 11: The Specimen Level

Computation Level

The information included in the computation level provides information related to:

- General computation data
- Computation agents
- Computation document
- Computation images
- Detailed loading characteristics (DLCH)
- Original loading signal (OLS)
- Mesh model
- Mesh model images
- Computer system and software

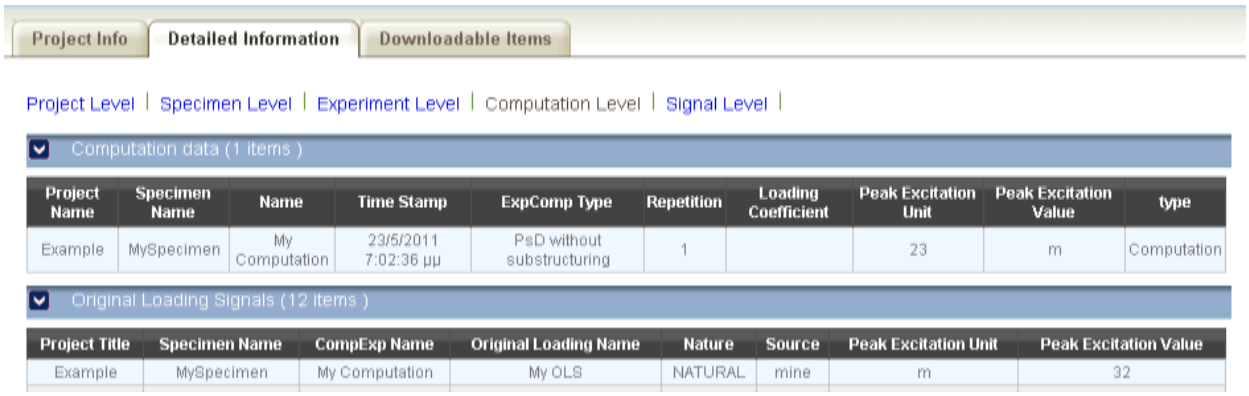

Figure 12: The Computation Level

Experiment Level

The experiment level provides the information, as depicted in figure 11, which is related to:

- General experiment data
- Experiment agents
- Experiment document
- Experiment images
- Experiment video
- Detailed Loading Characteristics (DLCH)
- Original Loading Signal (OLS)

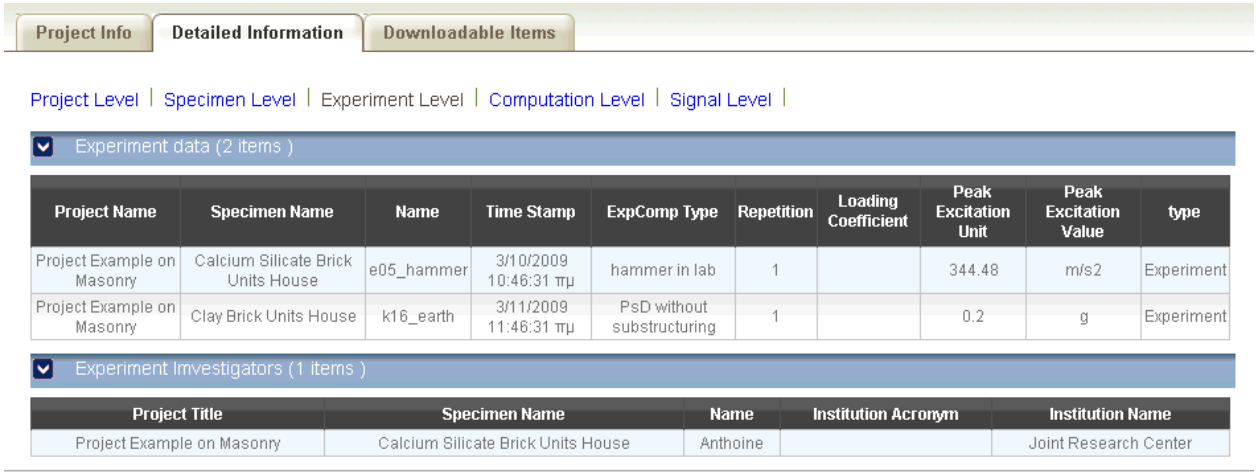

Figure 13: The Experiment Level

Signal Level

The signal level provides the information that is related to attributes, physical and type attributes of the signal as depicted in figure 12.

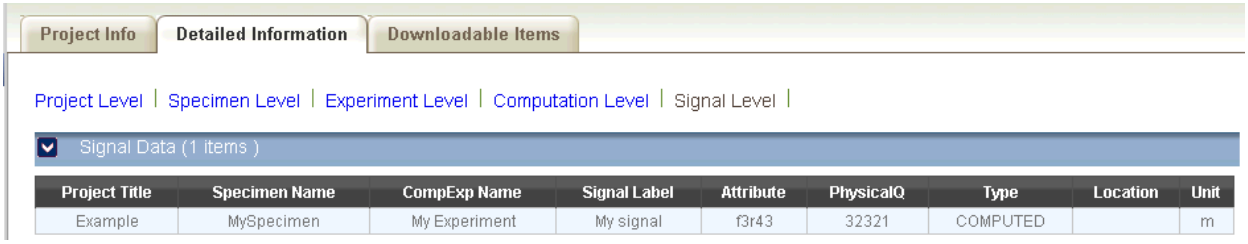

Figure 14: The Signal Level

Clicking on a item under whichever level the information related to this item are highlighted.

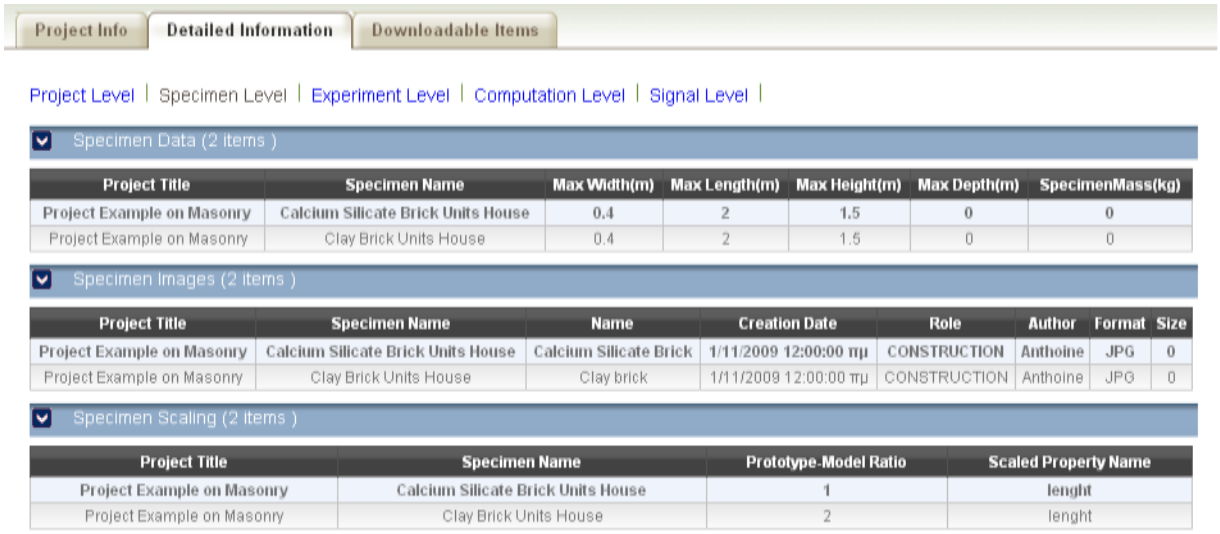

Figure 15: The Signal Level

1.1.7 Project Download Info Tab

"Downloadable Items": All the downloadable items of a project are available in this section. This tab like the "general project info" tab is showing the same information as long as nodes clicked are within the same projects.

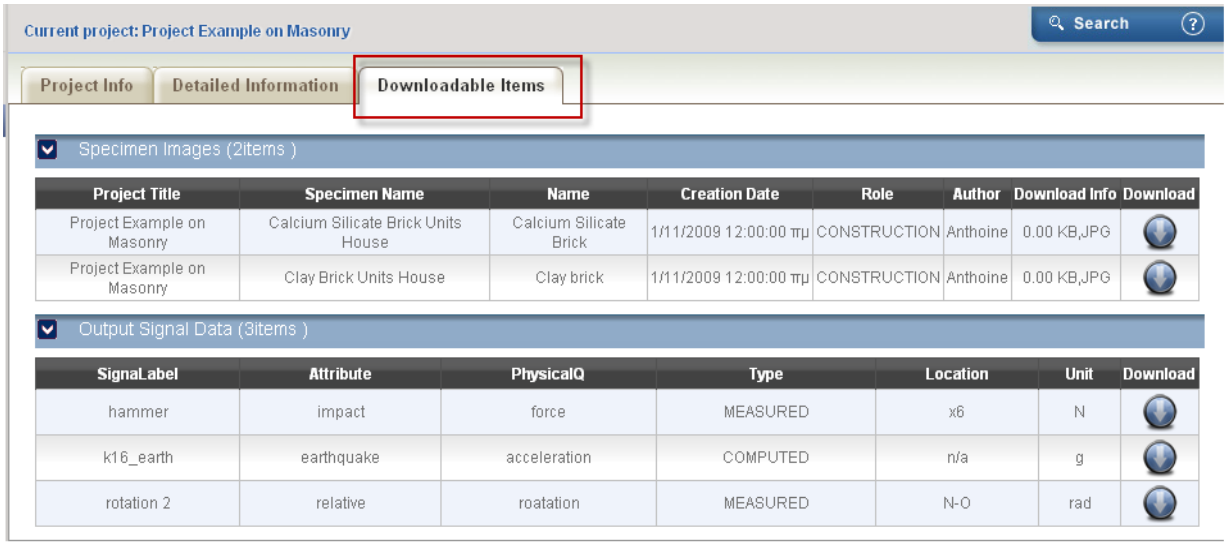

Figure 16: Download Tab

Files are grouped by according to the category they belong to

- Project Documents
- Specimen Documents
- Specimen Images
- Mesh Model Images
- Mesh Model Documents
- Experiment Images
- Experiment Documents
- Computation Documents
- Experiment Video
- Signals
- Detailed loading characteristics
- Original loading signals
- Signal

1.1.8 Terms and Conditions of Using Downloadable Items

Clicking on the download icon the "***Term and Conditions***" page is displayed. A user must accept the term and conditions before the download process begins. The text on the "Term and Conditions" page includes the following:

"*By using proprietary experimental data, supporting documentation or any other information (hereinafter the "Data") provided to you by a body, institute or laboratory within the project "SEISMIC ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES" (hereinafter "SERIES"), you agree to be bound by the following terms and conditions, and any policies or amendments thereto that may be subsequently introduced.*

All intellectual property rights in the data including, but not limited to, copyright and database rights are vested in their respective right holders (hereinafter the "Providers"). You are authorised - on a non-exclusive basis - to access, extract, reproduce, store, create derivative works and publish the Data on all media without alteration and subject to the provision of the following acknowledgment and disclaimer in all publications containing the Data:

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THE DATA IS PROVIDED TO THE HIGHEST POSSIBLE QUALITY AVAILABLE ACCORDING TO THE BEST PRACTICE AVAILABLE AT THE TIME OF ITS GENERATION. HOWEVER, YOU EXPRESSLY AGREE THAT THE USE OF THE DATA IS AT YOUR OWN RISK. TO THE MAXIMUM PERMITTED BY LAW, THE PROVIDERS EXPRESSLY DISCLAIM ALL WARRANTIES AND CONDITIONS OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE USE, QUALITY AND SUITABILITY OF THE DATA REMAINS WITH YOU. THE PROVIDERS WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, DIRECT OR INDIRECT DAMAGES INCLUDING, BUT NOT LIMITED TO, THE LOSS OF DATA, LOSS OF PROFITS, OR ANY OTHER FINANCIAL LOSS ARISING FROM THE USE OF THE DATA EVEN IF THE POSSIBILITY OF SUCH DAMAGES WERE FORESEEN, FORESEEABLE OR KNOWN BY THE PROVIDERS OR IF THE PROVIDERS WERE ADVISED OF SUCH RISK IN ADVANCE.

ANY REPRODUCTION OR DUPLICATION OF ALL OR ANY PART OF THE SERIES DATABASE IS PROHIBITED. ALL RIGHTS RESERVED."

Figure 17: Downloaded Icon

Search Functionality

1.1.9 Search criteria composition

The search functionality of the Data Access Portal is a structured keyword-based search. Keywords are separated according to the level that they are belonging to. Representative users are able to select any of the desired keywords from each category and click on the search button. The creation of complex queries is also supported by allowing a user to make multiple selections, as shown in Figure18.

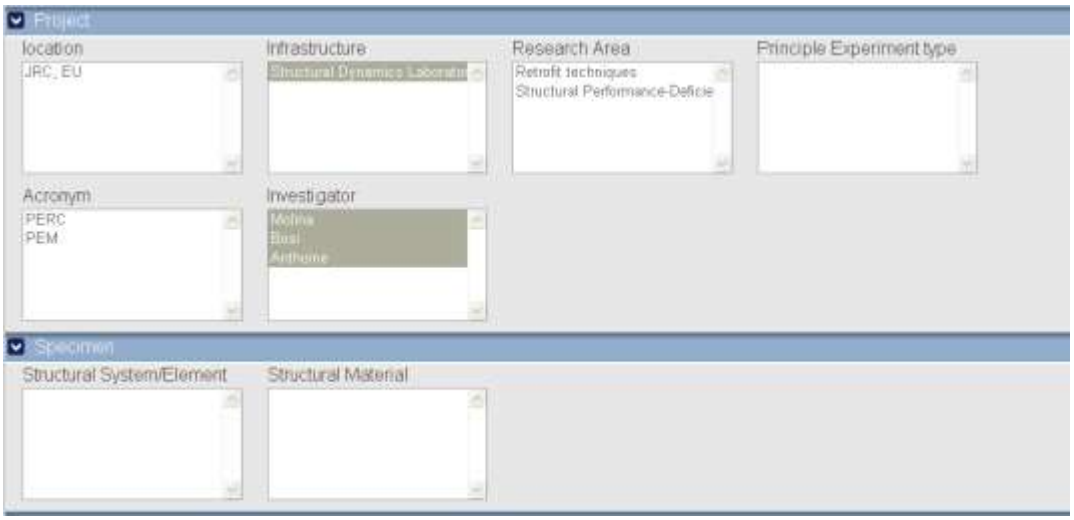

Figure 18: The Search Functionality

1.1.10 Search results presentation

The search results are presented in a structured approach as it can be seen in Figure 19, embrancing the description of each project and direct links to the download and the detailed project description web pages. This way a brief overview is presented for each project providing the opportunity to a user to navigate directly to the download page.

Figure 19: The Search Results

Furthermore, the search results are also displayed on a tree control on the left panel of the web page in which, the EDF levels that contain the search criteria are marked with red.

Figure 20: The Search Results View on a Tree Control

Privacy Options Related to Published Projects

In the frame of SERIES two district types of projects are supported: a) public and b) partner projects. These supported types are distinguished based on the privacy level they utilize. The

public projects are available to any visitor of the Data Access Portal whereas the Partner projects are available only to the member of the SERIES consortium.

Initially the Data Access Portal presents the public projects and not the partners projects which privacy status is defined from the laboratory the project belongs to. Only when a visitor uses the partner login feature of the Data Access Portal he will be authorized to access the partner projects. Partners of SERIES can use the credentials that already have from the main portal of the SERIES.

1.1.11 Partner Login

In Figure 21, the partner login process is presented, which entails the authentication of a user based on its credentials (i.e. username and password).

Figure 21: Partner Login

If a user enters wrong credentials he won't be able to access the partners but a ***"Partner not found"*** message will be displayed upper right corner. Instead, when a user enters the correct credentials the following actions are happening:

- The name of the partner and the logout option will be displayed in the upper right corner
- All the partner projects are displayed on the left pane under a new Tree View
- Public projects tree view is being hidden and the partner project is being highlighted (see as well Figure 23)

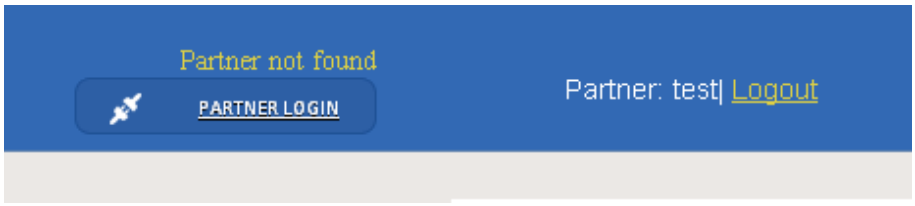

Figure 22: Successful and Unsuccessful Login

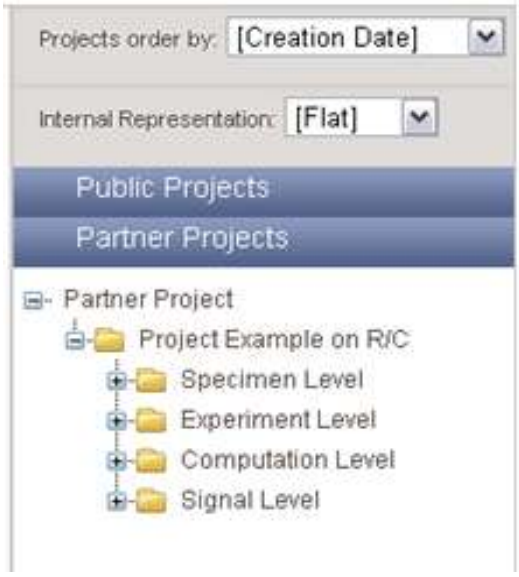

Figure 23: Partner Project Tree View

Public projects tree view can become visible again clicking on their title as it is shown in Figure 24

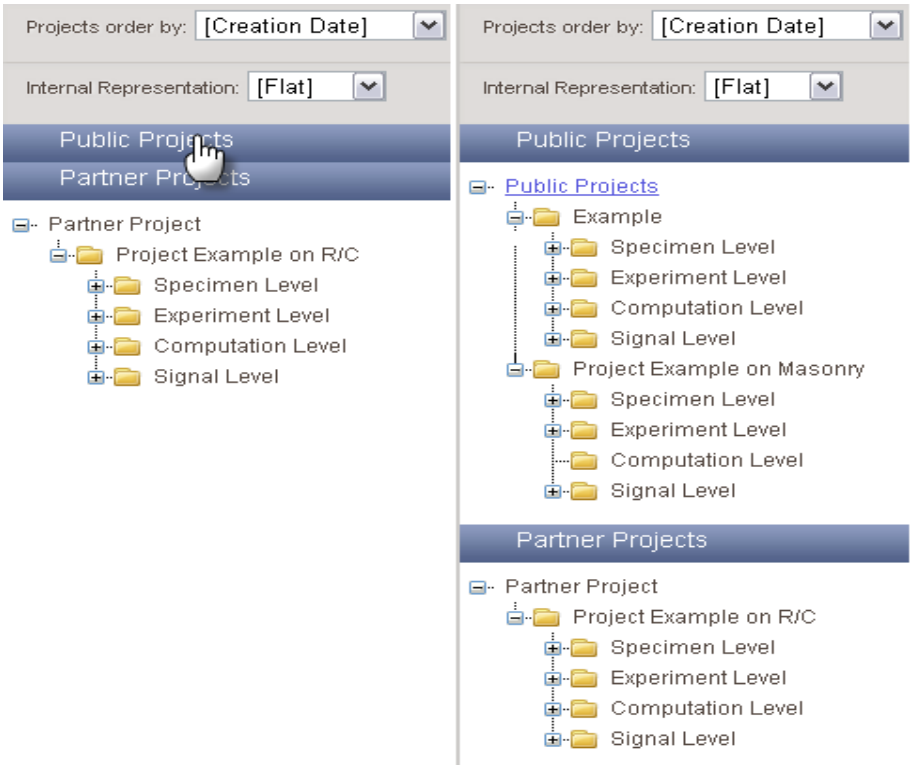

Figure 24: Tree View Expansion