

Deliverable Report

Publication of specification document for the central documentation facilities

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AIDA

Advanced European Infrastructures for Detectors at Accelerators

Seventh Framework Programme, Capacities Specific Programme, Research Infrastructures,
Combination of Collaborative Project and Coordination and Support Action

DELIVERABLE REPORT

PUBLICATION OF SPECIFICATION DOCUMENT FOR THE CENTRAL DOCUMENTATION FACILITIES

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Abstract:

A web based interface is under development to ease the access to information on the facilities developed within the AIDA project, the available experimental installations and the interfaces designed to allow combined test experiments. This document provides the specifications for the development of the web interface and of the access website.

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Delivery Slip

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Executive summary

Specifications have been set up for the development of a web based interface that will provide a transparent, easy-to-use and common access to the EDMS systems for the experimental community, particularly to the DESY and CERN systems. The web interface will allow to embed the documentation stored in more than one physical EDMS on pages of a dedicated website.

The report also encompasses requirements for the website, such as web structure, functional specifications and the design concept as well as technical requirements like technology platform, security and access rights, website domain and hosting.

The future steps relate to the finalization of the website and to the storage and structuring of the information within the DESY and CERN EDMS.

1. INTRODUCTION

The development of complex modern detector systems requires large test experiments, which typically are performed at test beam facilities either at CERN or at DESY. These experiments are intrinsically complex and include participants from several institutes and many pieces of equipment.

A key objective of AIDA is to provide an information and communication framework for these test beam activities in which the user can find information on the facilities, the available experimental installations, and the interfaces that have been designed to allow the combined test experiments. This means that an important short term task of the project is to ensure a complete documentation and a consistent structure of the information related to the infrastructures developed. In addition this information is to be kept up-to-date. In a longer term, a major effort will be devoted to support combined tests of detector prototypes, by supporting the development and documentation of specifications of all components and services in order to make sure that the prototypes that are using the infrastructures are compliant with those specifications and can operate together.

Within AIDA it has been decided that an engineering data management system (EDMS) will be used to handle the workflow of the engineering and costing tasks, including 3-dimensional computer-aided design (CAD) models, technical reports and specifications [1].

To make the system flexible and easy to use for both the provider of information and the user, a common WEB based interface is under development. It will allow the embedding of information stored in more than one physical EDMS system on pages of a dedicated website.

This document provides the requirement specifications for the development of such a web interface. It also encompasses requirements for the website, such as web structure, functional specifications and design concept as well as the technical requirements like technology platform, security and access rights, website domain and hosting.

2. WEBSITE PURPOSE AND TARGET GROUP

The main purpose of the website is to allow access to the CERN and DESY test beam facilities, and, initially, provide information primarily on experiments for tracking and calorimeter systems developed for the linear collider. Therefore the target group comprises the users of the infrastructures devoted to developing and testing detector technologies to be used at the linear collider, either members of the AIDA project or external collaborators.

The website should feature:

- Modern and user-friendly look and feel;
- Pages and sections with capabilities to fully manage the content.

The documentation comprises three main sections: test beam facilities, movable infrastructure and linear collider infrastructure. A brief description is given below.

2.1. DOCUMENTATION OF THE TEST BEAM FACILITIES

This section will provide a description of the test beam facilities operated at DESY, CERN and Fermilab. Information will be found about the test beam lines, beam generation and characteristics, operation, infrastructure and equipment and safety aspects.

2.2. DOCUMENTATION OF THE MOVABLE INFRASTRUCTURES

This section will primarily comprise information about the pixel beam telescope developed within the AIDA project in order to define the beam geometry very precisely and on the moveable stage available at the DESY test beam facility.

During the R&D phase for particle detectors a number of beam tests are needed to show the performance of the newly developed devices. In order to extract parameters such as resolution and efficiency, the track of the beam particle needs to be defined precisely, and usually beam telescopes are used for this purpose. A description of the beam telescope together with technical details, how to use the DAQ of the telescope and information about the analysis of the data will be provided.

2.3. DOCUMENTATION OF THE LINEAR COLLIDER INFRASTRUCTURE

The linear collider infrastructure focuses on the detector types used in nowadays collider experiments: infrastructure for the precise vertex detectors, infrastructure for gaseous tracking devices and silicon tracking devices, and calorimetry. The documentation to be provided will allow the evaluation and characterization of detector prototypes developed by users that belong or not to the AIDA project.

An example how the documentation for the tracking detectors is stored and structured within the DESY EDMS is shown in Figure 1.

3. REQUIREMENTS

3.1. FUNCTIONAL REQUIREMENTS

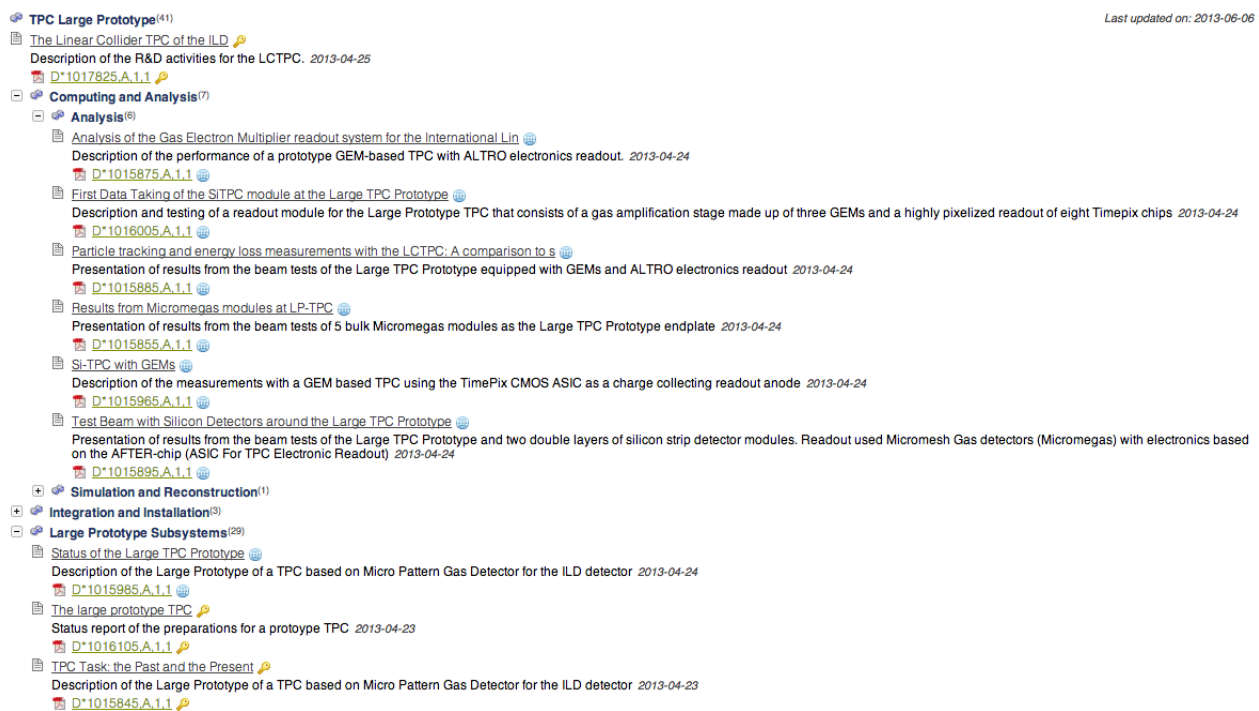
The EDMS will be used to manage, store and control all the information relevant for the conception, construction and exploitation of the infrastructures developed within the AIDA project during their whole life cycle.

The system should enable users to do the following:

- Storage and sharing of different types of documents;
- Management of processes such as the approval and release procedures for the documents, definition of rules for the version management and organization of the change control process for the baseline configuration;
- Visualization and mock-up features.

Such a system was introduced at CERN to manage the design and construction of the LHC accelerator and experiments, at DESY to support the construction of the XFEL project [2] and to manage the design of the ILC [3]. In fact many other laboratories currently consider implementing an EDMS system.

This raises the question whether we can develop one sole EDMS for the test-beam activities. The answer is that we probably cannot. Each institution that introduced such a system will document their activities locally. Besides, EDMS is an expert system, it requires an account and training to access the information and the users who are interested mainly in reading the information are not always willing to learn all the tools that is required to use the system.



TPC Large Prototype⁽⁴¹⁾

The Linear Collider TPC of the ILD

Description of the R&D activities for the LCTPC. 2013-04-25

D*1017825.A.1.1

Computing and Analysis⁽⁷⁾

Analysis⁽⁶⁾

Analysis of the Gas Electron Multiplier readout system for the International Lin

Description of the performance of a prototype GEM-based TPC with ALTRO electronics readout. 2013-04-24

D*1015875.A.1.1

First Data Taking of the SITPC module at the Large TPC Prototype

Description and testing of a readout module for the Large Prototype TPC that consists of a gas amplification stage made up of three GEMs and a highly pixelized readout of eight Timepix chips 2013-04-24

D*1016005.A.1.1

Particle tracking and energy loss measurements with the LCTPC: A comparison to s

Presentation of results from the beam tests of the Large TPC Prototype equipped with GEMs and ALTRO electronics readout 2013-04-24

D*1015885.A.1.1

Results from Micromegas modules at L.P.TPC

Presentation of results from the beam tests of 5 bulk Micromegas modules as the Large TPC Prototype endplate 2013-04-24

D*1015855.A.1.1

SI-TPC with GEMs

Description of the measurements with a GEM based TPC using the TimePix CMOS ASIC as a charge collecting readout anode 2013-04-24

D*1015965.A.1.1

Test Beam with Silicon Detectors around the Large TPC Prototype

Presentation of results from the beam tests of the Large TPC Prototype and two double layers of silicon strip detector modules. Readout used Micromesh Gas detectors (Micromegas) with electronics based on the AFTER-chip (ASIC For TPC Electronic Readout) 2013-04-24

D*1015895.A.1.1

Simulation and Reconstruction⁽¹⁾

Integration and Installation⁽³⁾

Large Prototype Subsystems⁽²⁹⁾

Status of the Large TPC Prototype

Description of the Large Prototype of a TPC based on Micro Pattern Gas Detector for the ILD detector 2013-04-24

D*1015985.A.1.1

The large prototype TPC

Status report of the preparations for a prototype TPC 2013-04-23

D*1016105.A.1.1

TPC Task: the Past and the Present

Description of the Large Prototype of a TPC based on Micro Pattern Gas Detector for the ILD detector 2013-04-23

D*1015845.A.1.1

Last updated on: 2013-06-06 10:55

Fig 1: Documentation of the infrastructure for the tracking detectors in the DESY EDMS.

To ensure an up-to-date access to key information stored in different systems we need to produce dynamically web page information from the public information stored in the DESY and CERN EDMS. This will allow access to information also for users without an EDMS account. Our scope at the outset is to provide access to the documentation of the infrastructures for the tracking and

calorimeter systems at the DESY and CERN test beam facilities, but the scope can evolve with time, depending on the users requirements.

A web based interface prototype called EDMSTreeBrowser is under development at DESY by the IPP (Information, Processes and Projects) support group. This will allow access to the structures and all publically accessible documents that are attached to it through a single URL that can be embedded into other web pages. The interface will provide a hierarchical view of the structures contained in the EDMS, will list the title and a description of the associated documents, and will provide links where the files can be downloaded. An example can be seen in Figure 1.

At present we do not have a similar access into the CERN EDMS, but a Hyperlink to a specified AIDA folder can be provided in the same web site where the DESY interface is generating information.

The next step after having an easy access to the information stored in different EDMS systems is to set-up an access website that will essentially embed links to the relevant information. A proposal would be that the access website shall have an own domain, for instance testbeam.org and shall be hosted at one of the two laboratories with a link provided to the AIDA site.

3.2. INITIAL WEBSITE STRUCTURE

The graphic in Figure 2 represents the initial site-map of the website as a reference only. The website administrator will be able to administer and edit the website structure and section titles easily and on all levels.

The home page will contain key information on the test beam infrastructures or a welcome message and the main navigation menu to all other areas of the website.

The website will be divided into the following sections:

The “Facilities” section will give an overview of the existing test beam facilities

- “CERN” sub-section will shortly describe the beam lines, infrastructure and equipment at the CERN test beam facility and will provide a link to its facility website.
- “DESY” will shortly describe the beam lines, infrastructure and equipment at the DESY test beam facility and will provide a link to its facility website.
- “FNAL” will shortly describe the beam lines, infrastructure and equipment at the FNAL test beam facility and will provide a link to its facility website.

The “Moveable infrastructure” section will provide a short description and links to the documentation of the existent moveable infrastructures.

The “Linear Collider Infrastructure” section will provide a short description of the large scale infrastructure developed for the linear collider detector R&D and contain will links to the following sub-sections:

- The “Sub-detectors” sub-section will include an overview and links to information describing the design, construction, commissioning and operation of state-of-art devices.

- “Vertex Detectors” will contain key information and links for the vertex systems
- “Tracking” will contain key information and links for the documentation of tracking systems. When the user will open this sub-section, the system will provide a life link into the DESY EDMS and will dynamically generate the WEB page information from the EDMS information. The structuring of the information to be provided is a precondition and is currently under development.
- “Calorimetry” will contain key information and links to the electromagnetic, hadronic and forward calorimeter systems. Again the system will provide links to the information stored and structured either into the DESY or CERN EDMS systems.

- The “DAQ/FEE” sub-section will document the activities toward a common DAQ system and front-end electronics.

- The “Software” sub-section will document the software packages developed within the AIDA

project and provide a link to AIDAsoft website.

- The “Projects” sub-section will document activities toward testing of integrated systems.

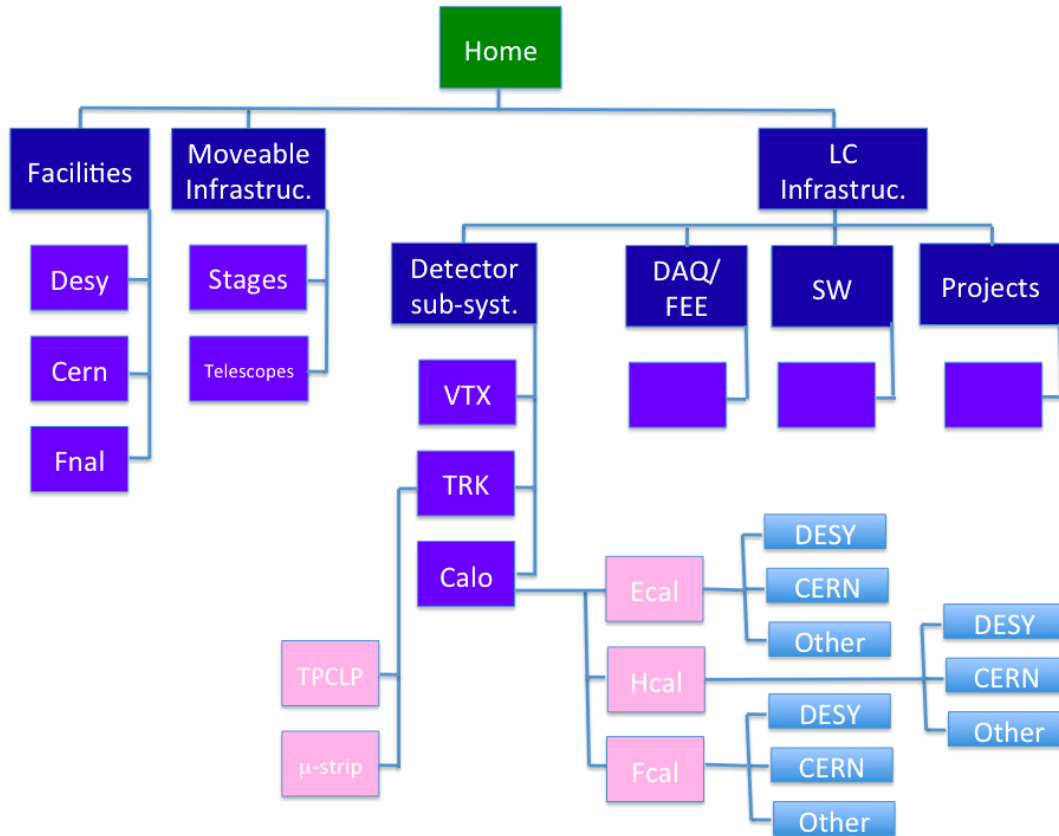


Fig. 2: Website architecture map

3.3. WEBSITE LAYOUT

A description of a possible website layout and functionalities is presented below.

Home Page Diagram

Figure 3 shows a proposed layout of the home page, representing the required fields and their preferable position and relative proportion to the browser window. The layout should be attractive, logical and intuitive to use, while providing an easy access to the main sections of the website. The proposed layout is not cut in stone and alternative best-practice layout proposals are still welcome. The navigation menu to the sections of the website will be a vertical bar situated on the left side, just before the main text area. The navigation to the sub-sections will be a top horizontal bar navigation, combined with dropdown sub-navigation.

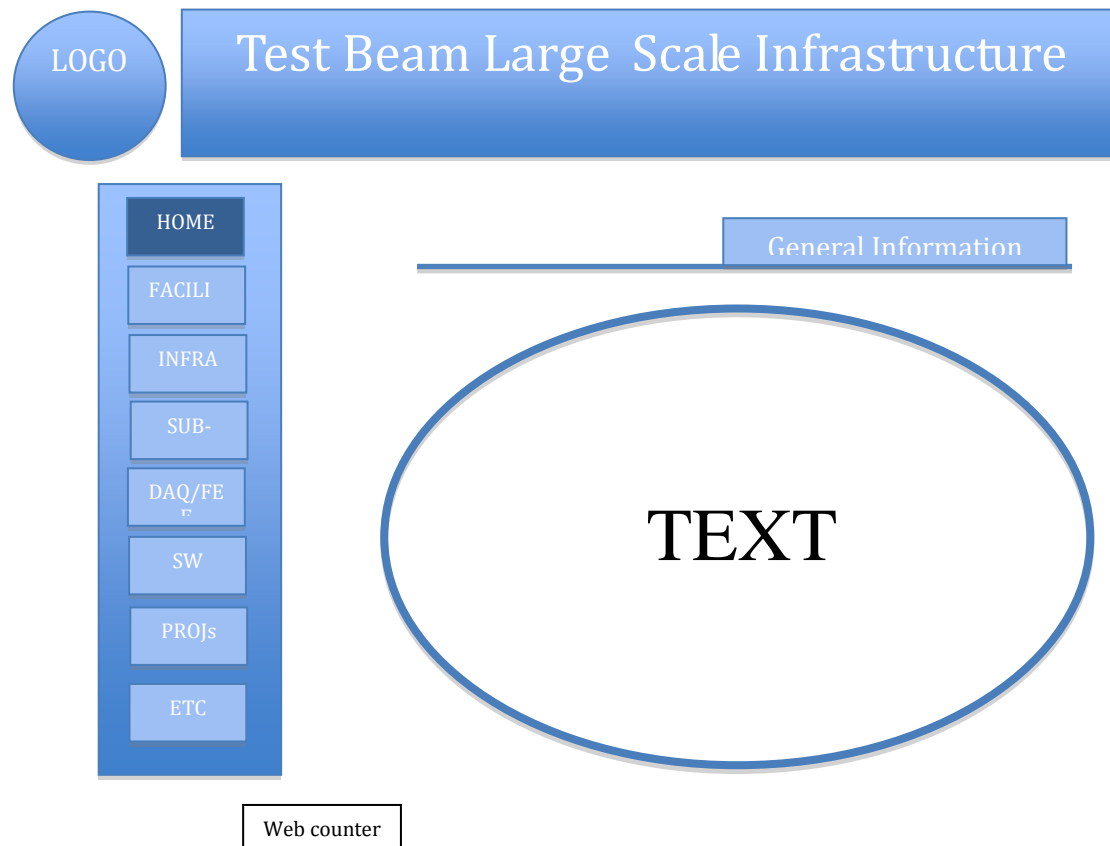


Fig. 3: Proposed layout of the home page.

The text field should facilitate users in reading the included information. The denoted “TEXT” field will be managed by an editor which will allow a rich text formatting, image and objects insertion and easy manipulation of tables.

Content Management System

The website content should be fully manageable by an associate at DESY. The CMS should comply the following:

- Password protected;
- Feature a rich-text content editor (for instance a WYSIWYG DHTML editor);
- Allow for managing (add/edit/delete) section and pages of the website;
- Allow for draft version and live content publishing;
- Easy to use.

3.4. TECHNICAL REQUIREMENTS

- The selected platform for the website development will be an internationally renowned and popular platform as for instance: Linux/Apache/MySQL/PHP.
- Most of the website will be publically accessible but the website administration will be restricted and password protected.

- The hosting could be done on an Apache server at DESY that will offer a sufficient loading speed of the website by both local and international users.
- The website should be compatible with recent versions of the following browsers:
 - Microsoft Internet Explorer;
 - Firefox;
 - Safari;
 - Chrome.

4. FUTURE PLANS

The functionalities of a web interface to access the documentation of the test beam infrastructures has been set up. The next steps relate to the finalization of the website, on one hand, and to the storage and structuring of the information within the DESY and CERN EDMS, on the other hand. Activities that we currently consider include:

- Development of a complete design for the web interface;
- Implementation of the website;
- Creation and filling of the content;
- Testing of the website;
- Store and structure the information within the EDMS systems at DESY and CERN.

The deliverable had been delayed by about 10 months mainly due to manpower constraints at DESY. Now the project is on its way and will be completed during the AIDA project lifetime.

5. REFERENCES

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