

E-Document Systems at ILC, Part II: ILC EDMS

Jochen Bürger, Jasper A. Dammann, Silke Eucker, Lars Hagge^{*}, Andreas Herz, Jens Kreutzkamp, Salvatore Pantó, Daniel Szepielak, Przemyslaw Tumidajewicz, Norbert Welle

Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

ILC EDMS is the central collaboration, documentation and configuration management platform for engineering design activities of the ILC. This paper gives a short introduction to the objectives and capabilities of ILC EDMS.

1 What is ILC EDMS?

The term Engineering Data Management (EDM), or synonymously Product Data Management (PDM) originates from the field of Computer-Aided Design and Manufacturing (CAD/CAM). EDM/PDM aims to integrate and organize product design and manufacturing information like e.g. specifications, CAD data, bills of materials, routing lists, change orders and inspection sheets. EDM/PDM has been superseded by the term Product Lifecycle Management (PLM), which expands the data-centric PDM view to include methods, processes and people, and to cover the entire product lifecycle from first ideas over design, manufacturing, installation, operation and maintenance, remodeling and upgrades, to deconstruction.

An EDM or PLM System (EDMS) is an information system framework which contains functionality for e.g.

- Document Management;
- 3D CAD Data Management;
- Product Structure Management;
- Configuration, Version and Change Management;
- Workflow Management;
- Visualization, Digital Mock-Up and Mark-Up.

An EDMS has to be configured for its project prior to use. For example, document and relation types have to be defined and included into the data model, rules for access control have to be defined and implemented, workflows have to be created, user interface have to be customized, and external interfaces have to be provided. Configuring an EDMS is usually an ongoing effort through the project lifetime, as new requirements are continuously arising as the project progresses into new phases. DESY has introduced an EDMS for managing the complexity and optimizing the design and production processes in its next-generation accelerator projects. The DESY EDMS has been extended for the needs of the ILC collaboration and in that configuration is labelled ILC EDMS.

^{*} Communicating author, lars.hagge@desy.de

2 ILC EDMS Objectives

The ILC EDMS is the central collaboration and lifecycle management platform for the Global Design Effort of the ILC. It will:

- Enable members of the ILC collaboration to access and contribute project information independent of location;
- Enable engineers at the different laboratories to collaboratively design components using 3D CAD;
- Enable scientists to participate in design processes from the very beginning by viewing the evolving CAD models;
- Provide teams, committees, boards etc. with workspaces for work-in-progress document management;
- Support change control of the ILC baseline during the EDR phase;
- Protect confidential information and intellectual property against unauthorized access.

3 Basic EDMS Functionality

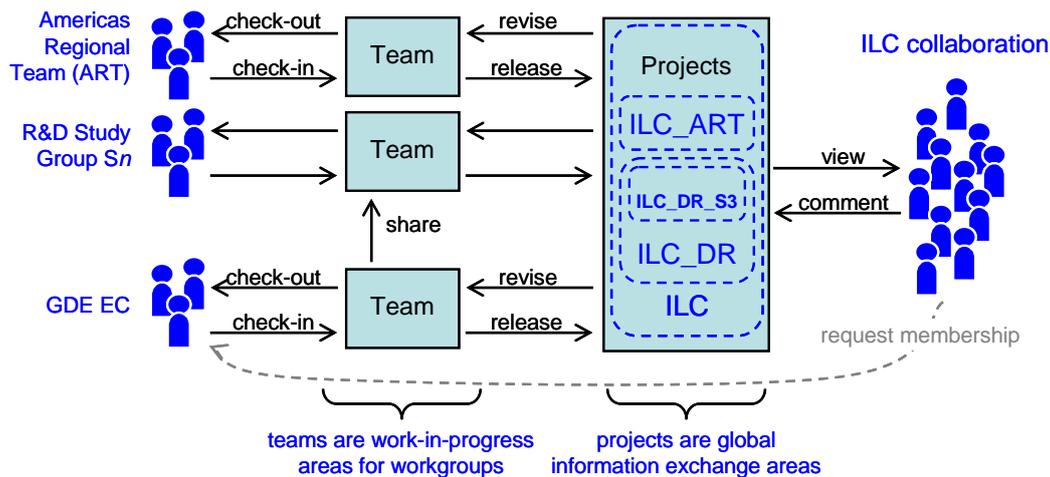


Figure 1. Basic EDMS operation principle

Figure 1 illustrates the basic ILC EDMS operation principle. The system offers local work-in-progress areas, so-called teams, for e.g. workgroups and boards. The teams interact with a web-like central information repository which is accessible for the entire ILC collaboration. The system offers a workflow engine for controlling reviewing, approval and change procedures.

4 Accessing 3D CAD Data

EDMS-ID	Name	Life Cycle State	Quantity
D00000000404473.A.1.85	3RD_HARMONIC_COMPLETE_ASSEMBLY	Working	
D00000000404269.A.1.2	COLD-MASS-SUPPORT_COVER_WELDMENT--42652	Working	2
D00000000404293.A.1.5	HARDWARE_COMPLETE_ASSY	Working	1
D00000000404299.A.1.5	COLDMASS_SUPT_SLIDING-WEL		
D00000000404302.A.1.5	COLDMASS_SUPT_FIXED-WELDM		
D00000000404428.A.1.8	STAND-ASSEMBLY		
D00000000404464.A.1.43	MAIN_COUPLER_WARM_ASSY		
D00000000404470.A.1.24	CRYO_3RD-HARM_VESSEL_ASSE		
D00000000404488.A.1.80	COLD_MASS_ASSEMBLY		
D00000000541513.A.1.1	HARDWARE_WARM_COUPLER		
D00000000541623.A.1.15	BELLOWS_TEST_1		

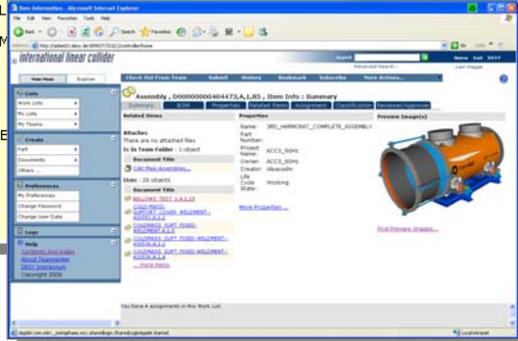


Figure 2. ILC EDMS screenshots showing example bill of materials and summary tab.

The ILC EDMS provides seamless integration of document and 3D CAD data management. CAD data items are treated like documents regarding e.g. storage and retrieval. They are organized using additional relations and hierarchies. Most important is the bill of materials (BOM), a hierarchical breakdown structure of a (sub-) system into its functional components. Defining a global ILC breakdown structure is one of the key success criteria for the ILC EDMS.

5 Putting ILC EDMS into Operation

ILC EDMS has been launched at LCWS/ILC 2007 workshop in Hamburg. The first groups who are adopting the system are the American Regional Team (ART) and the Beam Delivery System (BDS) group.

The ILC EDMS team is preparing training sessions which can be held by using Webex, and is organizing an ILC EDMS Power User Training to be held at DESY in November 2007. In addition, project management involvement is required for e.g. defining reference breakdown structures and policies for creating teams and projects. The team can be contacted at ilc-edms-support@desy.de.

6 References

- [1] J. Bürger et al., "DESY and ILC EDMS : Engineering Data Management for Large Scientific Projects", PAC 2007, Albuquerque, May 2007.
- [2] J. Bürger et al., "Towards Industrialization: Supporting the Manufacturing Processes of Superconducting Cavities at DESY", Phys C, 441(2006)268-271