WP4: Project office for Linear Collider detectors

Detector development for modern experiments in particle physics is a complex and demanding task, which goes well beyond the design and development of technologies for individual components. We therefore propose to develop and put into place a networking infrastructure, called the “Project Office for Linear Collider detectors”, which will help interested groups from Europe to participate in larger international efforts, and which will support the coordinated development of detector components. The main aim is to set up general tools for project coordination, engineering and documentation, setting standards wherever feasible. These tools and standards shall become available to the Linear Collider community.

The work package will base its ~~work~~ tools and mathods on existing efforts e.g. within the LHC detector projects as well as the Linear Collider accelerator projects. It will apply a learning-by-doing methodology to stay as close as possible to the projects presented throughout the DevDet proposal. To test and validate the chosen approach, the Project Office will therefore use tools and standards to coordinate the EUVIF infrastructure development of WP10, as well as the CLIC detector forward region design.

The Project Office will work in close collaboration with the different international initiatives towards Linear Colliders.

Task 4.1: Project Office tools and standards

Contact: Ties Behnke

1. General description of the task activities

The Project Office will develop an infrastructure of tools, standards and expertise, which will be made available to the groups proposing complex new experiments. These tools and standards shall be applicable to mechanical, electrical and electronic system components.

~~**1. General description of the task activities**~~

~~The Project Office will develop an infrastructure of tools, standards and expertise, which will be made available to the groups proposing complex new experiments. The Project Office will provide support in the following areas:~~

- ~~General information and documentation systems using one (or several) Electronic Document Management System (EDMS);~~
- ~~Access to engineering tools, help in integrating different tools within one project;~~
- ~~Access to project planning tools, support in the application of these tools to a complex project;~~
- ~~Definition of standards in the interface specifications, change control and reviewing procedures of complex projects.~~

~~These tools and standards shall be applicable to mechanical, electrical and electronic components of the system.~~

2. Organization participation

Institute	**Own commitments**	EU request (incl. Overheads) [€]
DESY	1.5 FTE 3 years (tbc) computing resources, licences 150k (estimated)	**1 FTE 3 y**
CERN	???	**???**
~~INFN~~	~~0.25 FTE * 4 y 12ppm =70k~~	~~0.25 FTE * 4 y = 12ppm = 75k~~
Total		
~~Total~~		

Participant acronym	CERN	DESY				
Estimated person-months per participant:		90				

3. Objectives

- Access and support for general information and documentation systems using one (or several) Electronic Document Management System (EDMS);

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- Standardisation and access to engineering tools, as well as putting in place mechanisms to exchange information between different tools;
- Standardisation and access to project planning tools, support in the application of these tools to a complex project;
- Definition of standards in the interface specifications, change control and reviewing procedures of complex projects.

~~- Provide, adapt and operate one or several interoperable EDMS meeting the needs of complex detector projects.~~

~~- Provide access to interoperable engineering tools and provide good practice rules for their usage.~~

~~- Provide access to interoperable project planning tools including cost control.~~

- ~~Set standards in interface definition, change control and reviewing procedures.~~

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4. Description of work

Within the Global Design effort an EDMS has been setup and is maintained for the accelerator design and management. The Project Office in its branch located at DESY will develop, install, and make available this system for the experimental community. This will involve the development of the system to meet the needs of the experimental community, the operation of the system, and support for its usage.

A major challenge will be to achieve a high level of transparency in the document management system while at the same time facing a very heterogeneous environment of tools and systems used by the users. Because of the nature of the experimental community (many small university groups, no central funding mechanisms, reliance on short term staff, students and postdocs) standardization on one or a few tools needed in the design process of a detector are difficult to impossible. Therefore a major goal of this effort will be to develop ~~tools and~~ mechanisms to enable the exchange of information between different tools, to provide interfaces between different programs, and to help the users in maintaining and updating information. In a longer term process, the Project Office will work with the participants towards a reduction of the existing variety of tools and practices, and a set of recommended standard tools.

To achieve this goal the Project Office will – in communication with the experimental groups – develop and centrally provide tools, as requested by the users, and make them accessible to the groups. It will communicate with similar efforts outside of Europe, and try to negotiate common solutions. It will thus enable European Groups to participate more easily and effectively in the overall design effort, and make more significant contributions in the development of the experimental program at the Linear Collider.

To do this the Project Office will require one full time staff member at DESY starting in 2009. The Office will work in close cooperation with the DESY Information and Project Support group IPP to develop and maintain the necessary tools. It will be supported by members from DESY on the technical questions and by providing the needed computing resources.

List of Deliverables for the task
(typically 1 per task per year)

Deliverables of task 1	Person month estimate	Description/title	Nature[1]	Delivery month[2]
wp.t.1				
wp.t.2				

List of Milestones for the task

Milestones	Description/title	Tasks involved	Delivery month[2]	Means of verification
wp.t.1				

Comment [OU1]: This task shall not only cover EDMS, but also the item items in the Objectives list mentioned above.

Comment [OU2]: As this possibly read by non-expert reviewers, it would be good to describe in a few words what EDMS is, why it is essential and and kind of data it will contains.

Comment [OU3]: I think that this approach is too pessimistic and make the WP difficult to defend. We shall try to set/recommend standards, while maintain exchange of information between the most commonly used tools

Comment [OU4]: I believe that sentence takes care of Lucie's worry.

wp.t.2				

[1] Nature: R=Report, P=Prototype, D=Demonstrator, O=Other
[2] Counted from the starting date

Task 4.2: Coordination of the EUVIF infrastructure

Contact: Martin Pohl

1. General description of the task activities

As a first practical application of the tools developed under Task 4.1, the Project Office will coordinate the Vertical Integration Facility EUVIF described under WP10 of this proposal. EUVIF is a large-scale infrastructure made available to the LC community to test and further develop detectors in an integrated way for the next generation Linear Colliders ILC or CLIC. The installation and operation of this infrastructure is a major task, which requires significant resources and support. The Project Office branch located at CERN and University of Geneva will coordinate the setup, the commissioning and the running of this facility. It will work with the participants to define common standards wherever possible. A major effort will be devoted to documenting interfaces and keeping this documentation up-to-date.

Comment [OU5]: Let's see. This needs a bit more in-house discussion. Initially I thought that CERN would contribute in 4.1 and 4.3.

2. Organization participation

Institute	**Own commitments**	EU request (incl. Overheads) [€]
Uni Geneva	1.2 FTE*3y = 43ppm = 250k consumables 100k	0.5 FTE x 3y = 18ppm =105k + 8k = 113k Material, licenses 45k + 4k =49k
DESY~~CERN~~	0.5 FTE*3y = 18ppm = ???k	none~~???~~
INFN	0.25 FTE * 4 y 12ppm =70k	0.25 FTE * 4 y = 12ppm = 75k
Total		
~~Total~~		

Participant acronym	DESY	INFN	UniGe			
Estimated person-months per participant:	18	12	61.2			

3. Objectives

- Propose and develop specifications of the interfaces, ensure the compliance to these by prototypes to be integrated into EUVIF.
- Define standards for and coordinate ~~and support~~ a common DAQ architecture to be used by the experimenters at the EUVIF.
- Define ~~and support~~ standard for and coordinate a common slow control architecture to ensure safe operation of the Facility.
- Coordinate the operation and usage of EUVIF

4. Description of work

The Project Office ensures a consistent information structure related to the technical infrastructures and tools provided by EUVIF, based on the EDMS developed under Task 4.1. In the preparatory phase, the Project Office establishes detailed technical specifications for all components and services, in the form of a master plan. While individual partner institutes or groups provide individual infrastructure or detector components, the Project Office checks their compatibility with the global technical framework and the master plan. Change control procedures ensure that the documentation provided is accurate and up-to-date. During the installation phase, the Project office is central in the definition of installation scenarios and scheduling. During the exploitation phase of EUVIF, the Project Office coordinates internal and transnational access to the EUVIF infrastructure.

To do this task one full time person will be required at CERN, starting in 2010. It will receive support from the University of Geneva as far as Data Acquisition aspects are concerned, and from CERN on technical and administrative matters.

List of Deliverables for the task
(typically 1 per task per year)

Deliverables of task 1	**Person month estimate**	**Description/title**	**Nature**[1]	**Delivery month**[2]
wp.t.1				
wp.t.2				

List of Milestones for the task

Milestones	**Description/title**	**Tasks involved**	**Delivery month**[2]	**Means of verification**
wp.t.1				
wp.t.2				

[1] Nature: R=Report, P=Prototype, D=Demonstrator, O=Other
[2] Counted from the starting date

Task 4.3: Coordination of the detector integration in the ~~development for the~~ CLIC forward region

Contact: Lucie Linssen

1. General description of the task activities

As a second practical application of the tools developed under Task 4.1, the Project Office will coordinate the detector ~~development~~ integration efforts for the forward region of a future CLIC detector.

2. Organization participation

Institute	**Own commitments**	EU request (incl. Overheads) [€]
CERN		**???**
Total		

Participant acronym						
Estimated person-months per participant:						

3. Objectives

- Objective 1
- Objective 2

4. Description of work

A second implementation effort will be directed towards the implementation of the CLIC forward detector region integration. This will be a very relevant test-case example of the use and exchange of project office tools. Extensive studies have been carried out in relation to ILC forward region design. These studies involve a number of beam ad physics simulation tools (including tools further developed under WP2), as well as engineering design tools. Though very relevant for the CLIC forward region design studies, they undoubtedly need important adaptations for CLIC. The integration of the CLIC forward detector region design will interface wit the CLIC accelerator design, which so far has been using different simulation and engineering standards…….

List of Deliverables for the task
(typically 1 per task per year)

Deliverables of task 1	**Person month estimate**	**Description/title**	**Nature**[1]	**Delivery month**[2]
wp.t.1				
wp.t.2				

List of Milestones for the task

Milestones	**Description/title**	**Tasks involved**	**Delivery month**[2]	**Means of verification**
wp.t.1				
wp.t.2				

[1] Nature: R=Report, P=Prototype, D=Demonstrator, O=Other
[2] Counted from the starting date