

# DISTRIBUTED PROJECT MANAGEMENT AT THE EUROPEAN XFEL

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## Abstract

The European XFEL project at DESY has introduced a distributed project management system (DPMS) based on Microsoft Project Enterprise to keep track of schedules, resource usage, investment planning and actual costs. The XFEL project is organized into more than 40 work packages (WP) which address the different technical subsystems, global infrastructure and general tasks. Each WP is led by a work package leader (WPL) who is responsible for the WP budget, schedule and resources. The DPMS enables WPLs to directly update project plans for their WP, and it automatically creates high-level aggregated views for the project management office. Along with the system introduction, processes for distributed project planning, controlling and reporting have been established. One of the key challenges which can be resolved with the DPMS is to identify and track dependencies among different WPs, and to determine and escalate the impact of changes in one WP to other WP schedules. The paper gives an overview of the system and the established project management processes and reports experience.

## INTRODUCTION

The European XFEL involves about 40 work packages (WP) for R&D, construction, installation and commissioning activities. Each WP has a leader (WPL) who is responsible for its cost, personnel and time planning. Strong dependencies exist between different WPs. Some WPs or parts of WPs are contributed by institutes in participating countries as so called in-kind contributions.

A central distributed project management system (DPMS) was introduced to obtain a consistent and maintainable project plan. The DPMS allows WPLs to manage project plans of their WP. It enables the project office to keep track of milestones, and it provides the project management with aggregated, up-to-date infor-

mation of the entire project situation. The implemented DPMS solution satisfies the following essential requirements:

- The DPMS enables and supports the defined XFEL project management process
- The DPMS enables WPLs to maintain separate project plans for their WP
- The DPMS provides a centrally maintained resource pool which lists the available resources for all WPs
- The DPMS propagates dependencies between work packages by linking milestones
- The DPMS generates status reports from published project planning data
- The DPMS provides a central point of entry for all actors in project planning
- The DPMS integrates with an Enterprise Resource Planning (ERP) system for costs controlling
- The DPMS provides role-based user interface for project management, project office, WPLs and project resources.

## ARCHITECTURE

The implemented DPMS solution is based on the Microsoft Project Enterprise platform. Access to the project plans and aggregated data is provided by a role-based following web-interface (Figure 1) which supports the following roles:

- **Project management** can access aggregated information like milestone plans or expenditure reports
- **WPL** can maintain their WP plans incl. schedule and resources, and provide quarterly progress reports
- **Project office** maintains milestones, analyses planned costs and personnel resources, supports WPLs
- **Group leader** (leader of organizational groups at DESY) can access the assignments of their group's resources to the different WPs.

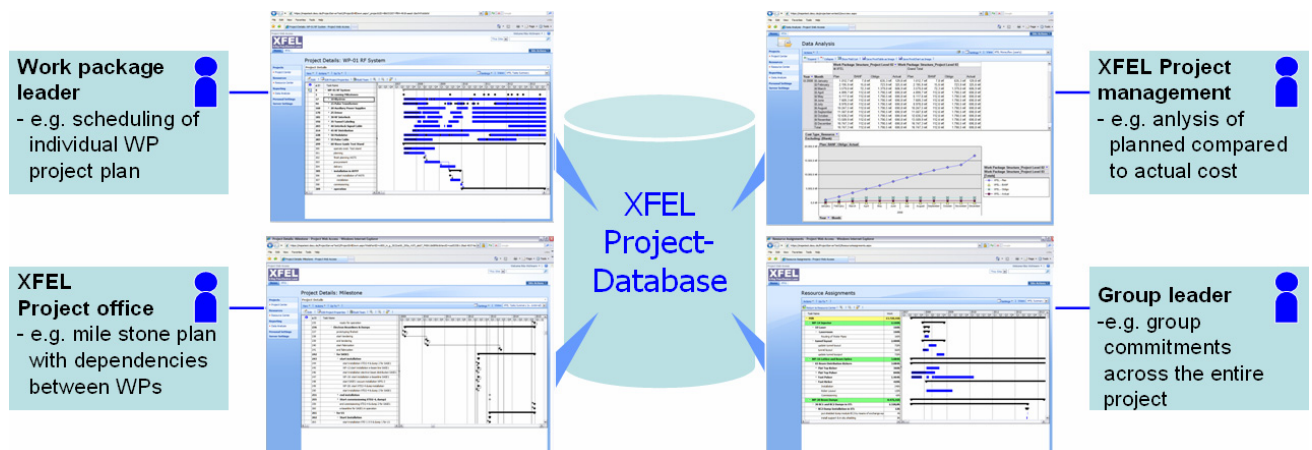


Figure 1: Role-based architecture of the XFEL Distributed Project Management System (DPMS).

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The DPMS interfaces with DESY's ERP-system (SAP) for uni-directional data transfer from SAP to the DPMS. The data is used in conjunction with reporting and analysis. Users from outside DESY can use a Terminal Server to access the DPMS.

### PROJECT PLANNING

Project planning is always initiated by the project office, which provides an initial project plan to a WPL. This plan contains the 1<sup>st</sup> level work breakdown structure of the WP, which corresponds to the summary tasks as defined in the project structure plan. An identical structure is maintained in the ERP system, and aggregated numbers from the ERP system are shown in the project plan at this level. The WPLs are then further detailing the plans.

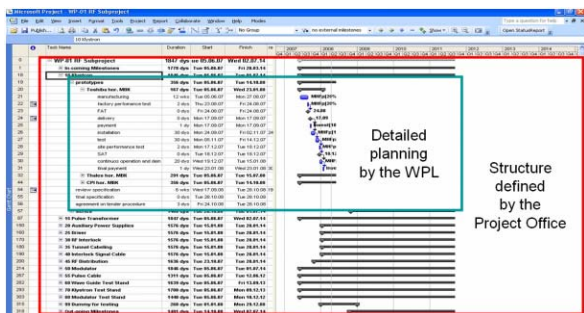


Figure 2: Structure of XFEL WP project plans.

An overall XFEL milestone plan collects the essential milestones from each WP. The milestones can be propagated to other work packages to implement dependencies between WPs (Figure 2). The XFEL milestone plan is maintained by the project office.

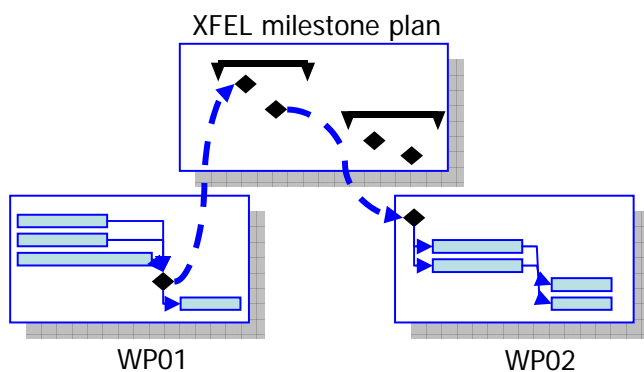


Figure 3: Implementing dependencies by propagating milestones: WP02 tasks are depending on tasks of WP01. WP01 provides a milestone to the XFEL milestone plan, from where it is linked by WP02.

Resources are implemented as so-called “generic resources”. Generic resources are representing groups and participating institutes, rather than individuals. The DPMS distinguishes “work” resources from “investment” resources. For work resources, the capacity is stored for each resource, so that over-allocations can be monitored. Investment resources are implemented for planning e.g.

expenditures and the use of workshops and other common infrastructure.

Project plans should expose different levels of detail for the near and farer future. As a rule, tasks in the next reporting period should have a typical length of half to one-and-a-half times the reporting period. Later tasks can be longer, but have to be detailed as they come nearer. Investment and work resources have to be assigned to all tasks and the dependencies from other WPs have to be determined [1]. Figure 4 illustrates task planning. The reporting period at XFEL is three months.

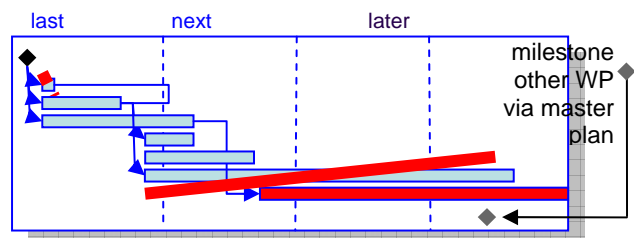


Figure 4: Example for task planning (see text).

### PROGRESS TRACKING

Figure 5 illustrates the iterative progress tracking and project updating process. At the end of every reporting period, WPLs are asked to summarize the achievements of the last period and give an outlook on the plans for the next period.

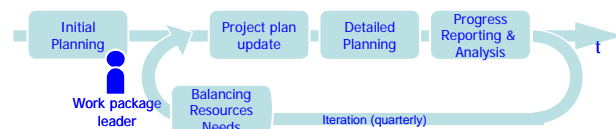


Figure 5: XFEL project planning and updating process.

Achievements are measured in terms of reached or delayed milestones. Costs are reported as comparison of the planned expenditures with the actual costs development as available in the ERP system.

A	B	C	D	E	F	G	H	I	J	K	L	M
1												
2	Status report for WPx as of 13.06.2008											Get data
3												
4												
5	A) General Project Information											
6	Project:	WPx		Project FTE Budget:	228							
7	Project Leader:	Work package leader		Project Work (Manmonth):	226							
8	Project start:	01.01.2007		Project % compl:	6,0%							
9	Project finish:	31.03.2014		Project % work:	3,0%							
10	Project Statusdate:	NA		Project Invest Budget:	58.273 k€							
11	Last Update:	07.02.2008		Investment cost:	58.273 k€							
12												
13												
14												
15	B) Completion of milestones											
16												
17	Milestone	Current date	/	Last quarter's date	Comment							
18	intermediate review	14.09.2007		14.09.2007								
19	review meeting	18.09.2007		18.09.2007								
20	finish pulse cable prototype oper	17.12.2007		17.12.2007	additional milestone achieved							
21	cm prototype test	28.12.2007		28.12.2007								
22	A Milestone	04.02.2008		15.12.2007	2nd test was required, but still ahs							
23												
24												
25												
26												
27												

Figure 6: Example for a generated status report.

The DPMS has automated most of the regular reporting. It provides WPLs with an MS Excel based template for status reports (Figure 6). The template contains pre-filled values for general WP characteristics (Figure 6, top), short-term milestone status (Figure 6,

