Project Planning for Software Development

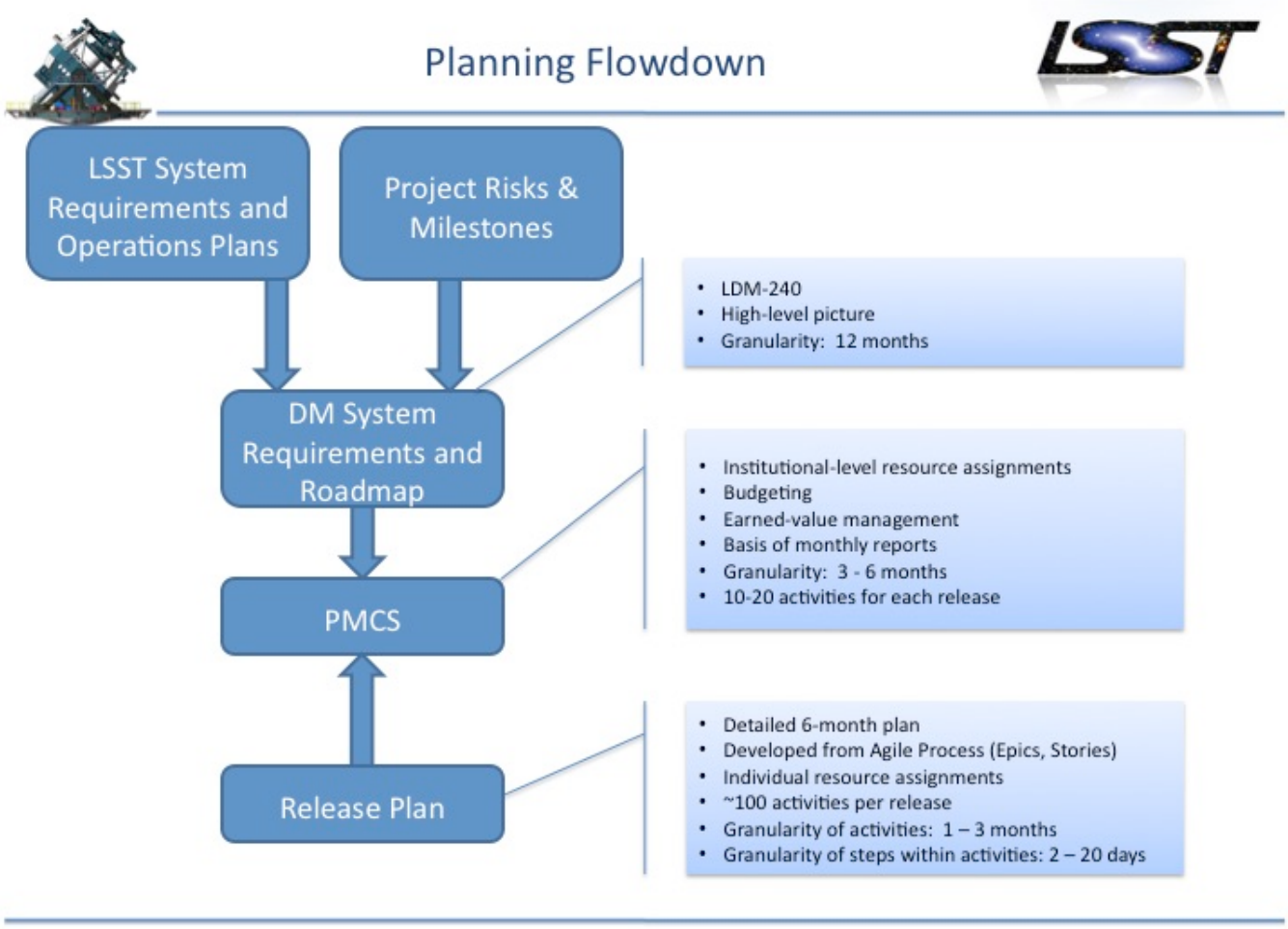
Migrated to new developer documentation

The contents of this page has been migrated to the new developer documentation; from late on 2016-02-04 it will appear at http://developer.lsst.io/en/latest/processes/project_planning.html.

This page describes the project planning process used in DM for software development. This process is a fusion of NSF and Federal mandates for Risk and Earned Value Management and Project Planning with Agile Process. Our nickname for this process is "Agile for Government".

Data Management Planning Process

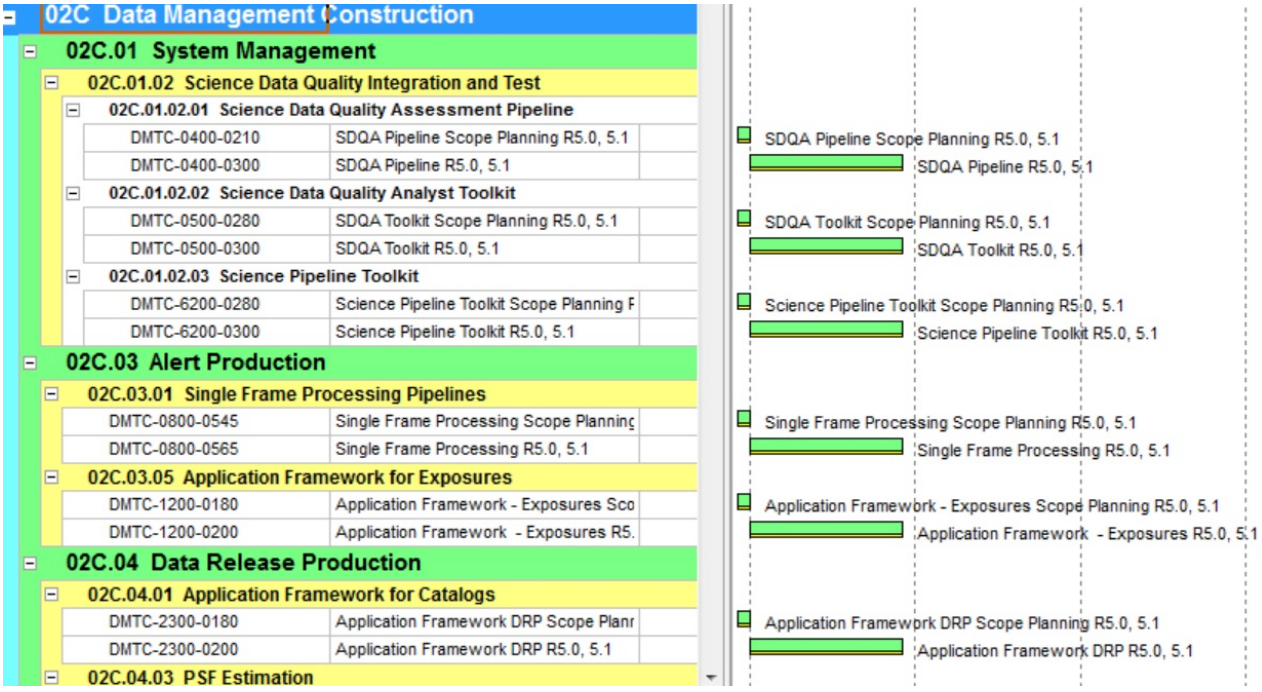
As LSST is now in Construction and funded under the NSF Major Research Equipment and Facilities Construction (MREFC) budget, the planning process has become more formal than was the case in R&D. For the primary work plans during Construction, the following process has been used.



1. Using the flow-down of System Requirements (LSE-30) to DM System Requirements (LSE-61), LSST Program Schedules, LSST Operations plans, and a DM section of the LSST Risk Register that assesses the perceived programmatic and technical risks, a set of time-phased software capabilities and key progress metrics for the DM System has been defined. The DM Roadmap (LDM-240) "bins" these planned software capabilities and key progress metrics into "coarse-grained" 12-month periods. These activities encompass all major DM R&D work in all areas (DM System Management and Engineering, Applications, Middleware, Infrastructure).

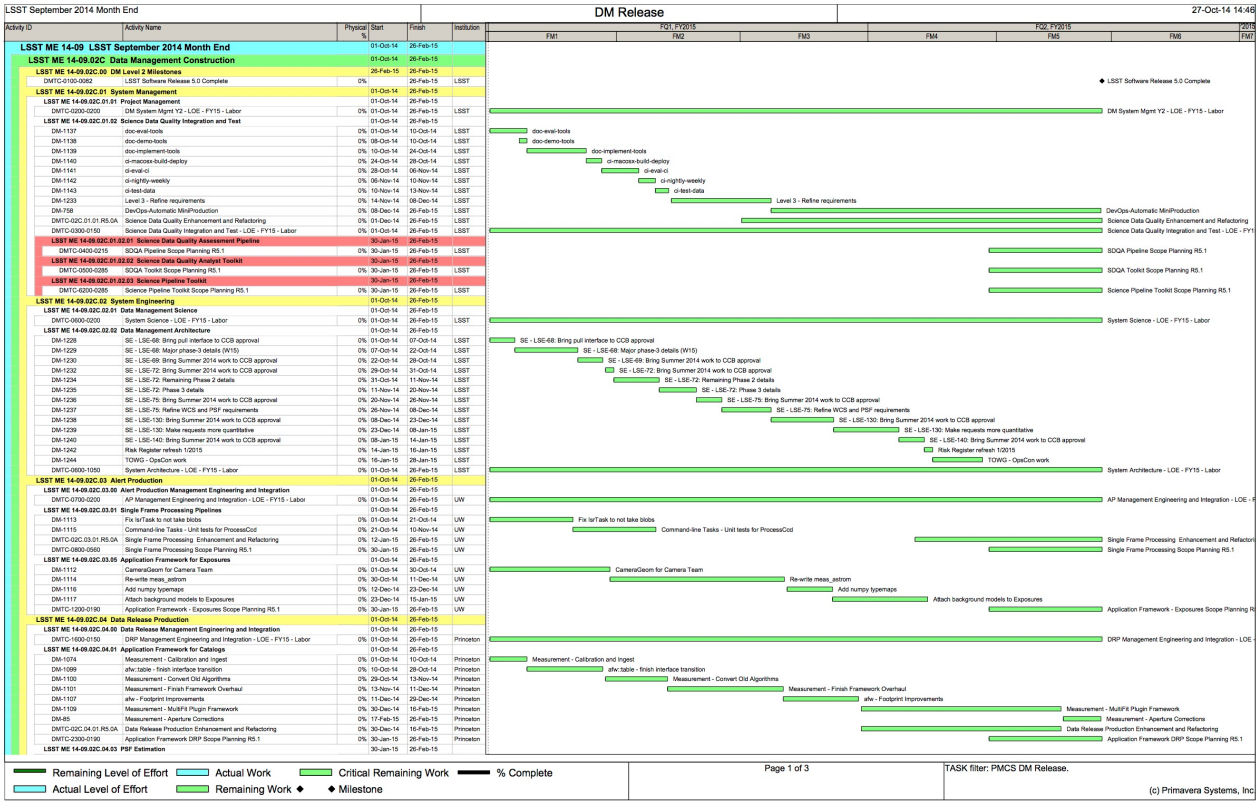
LSST Data Management Software Development Roadmap							
Release	**Institution**	**R4.0**	**R5.0/5.1**	**R6.0/6.1**	**R7.0/7.1**	**R8.0/8.1 - #1 Release for ComCam**	**R9.0/9.1 - for C**
Elapsed time (years)		**1**	**2**	**3**	**4**	**5**	
Finish Date		**8/31/14**	**8/31/15**	**8/31/16**	**8/31/17**	**8/31/18**	**8/3**
Year during which work is done		**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**F**
02C.01 System Management	**LSST**						
02C.01.02 Science Data Quality Integration and Test	**LSST**						
02C.01.02.01 SDQA Pipeline	**LSST**		R&D code base mined for reusable components. Ability to collect QA data from program outputs and store them into a database. Collect and compute metrics relevant to algorithms in development.	Collect and compute metrics relevant to algorithms in development.	Collect and compute metrics relevant to algorithms in development.	Collect and compute metrics relevant to algorithms in development.	
02C.01.02.02 SDQA Toolkit	**LSST**		R&D code base mined for reusable components. Image and catalog visualization in support of software development activities Image, catalog, and measurement visualization system. (LSE-63 Level 0 DQA)	Image and catalog visualization in support of software development activities Debugging toolkit for LSST software stack. (LSE-63 Level 0 DQA)	Image and catalog visualization in support of software development activities (LSE-63 Level 0 DQA)	Visualization and exploration of telemetry, catalog, and image data in support of nightly observing. (LSE-63 Level 1 DQA)	Visualization exploration o catalog, and i support of da quality analy (LSE-63 Level
02C.01.02.03 L3 Toolkit	**LSST**	End-user and developer documentation generated for the DM software stack	LSST DM stack installable and usable by science users	Maintain science user usability of DM stack	Maintain science user usability of DM stack	Maintain science user usability of DM stack	Tools for uplo the LSST data configuring a Level 3 pipeli
02C.03 Alert Production	**University of Washington**						
			CCD assembly ISR removal (defects, dark, flat, bias)				

2. In the LSST Project Management Control System (PMCS) the DM Project Manager creates and maintains software and data release and management /system engineering project plans that encompass the entire Roadmap and add the next level of detailed work planning. In addition, the plans cover activities specific to preparing and conducting formal reviews. The granularity of the release activities in this plan are 3 to 6 months each. Each activity includes the activity description, expected start and end dates, and resources assigned. Inter-activity dependencies are also captured to allow for critical path method scheduling and analysis. This plan is the "top-down" plan for the entire Construction phase. It is the basis for all LSST budgets and the Earned Value Management required by the MREFC process.



3. At the start of each 6-month period (aka each new Winter or Summer Release) each DM Cost Account Manager (CAM) interviews the institution team and creates a very detailed work plan, with individual activity granularity from 1 to 3 months (Technical/Control Account Manager Guide). Further, each activity is divided into steps of 2 - 20 days effort. This plan is known as a Release Plan. This process is done via the Agile Process, including backlog and sprint meetings, interactive communications, and design reviews. This process is accomplished in JIRA Agile (JIRA Agile Usage), outside the PMCS. Then plan is incorporated into the PMCS. Once work starts on the release, this level of plan is tracked on a weekly basis, and the status is rolled up to the PMCS (see DM Reporting Process below).

The PMCS actually includes all activities to be performed during the current release period, even those that are not directly part of the data production and release (e.g. LSST and Agency Review activities, level of effort activities covering periodic meetings such as risk management meetings, etc.). While the plan includes both release and other activities, the plan is coded in PMCS so that those activities that are part of the data production and release can be easily identified in filtered views of the plan.



Data Management Reporting Process

The DM project (including all DM contracted institutions) is legally required to provide monthly status reports to LSST senior management, including the AURA Management Council for LSST (AMCL). These monthly reports are also provided to the funding agencies, and are audited annually by Federal auditors. Non-compliance with reporting requirements is cause for contract termination. As discussed above, the DM Project Manager maintains release and management/system engineering plans in the LSST Project Management Control System (PMCS). Each activity in the plan includes the name of the activity, expected start and end dates, and assignees (with primary/lead person listed first).

The LSST Project provides JIRA Agile, a web-based tool for Agile development. JIRA Agile is used as a means to capture the Epics and Stories that are imported into PMCS in the Release Planning process described above. As the team performs Agile sprints, stories are marked as Done when they are implemented. The Story status is imported into PMCS for monthly status reporting against the plan. The status collected marks the Stories (Steps) as 100 % complete which updates the Epic (Activities) % complete, and sets the actual start and expected finish dates. The LSST Project Planner exports the list of recently completed stories from JIRA Agile into tables, sorted by WBS and Epic, and imports the status into PMCS.

The standard weekly status reporting cycle is as follows:

Monday: Each DM partner institution Cost Account Manager (CAM) verifies that Stories have been correctly mapped into Epics and Sprints (Technical /Control Account Manager Guide). Large-scale issues that affect the overall release schedule or scope are discussed at the weekly DM Leadership Team meeting. The LSST PMCS planner publishes pdf files of the current release plans. (DM Release Plans)

Tuesday: DM team discusses status, issues, blockages, progress in Release Coordination Standup Meetings.

Friday: All primary resources (i.e. lead individuals in each Story) mark completed Stories as Done in JIRA Agile. The LSST Project Controls Specialist imports the updated Story status into PMCS.

The standard monthly progress reporting cycle is as follows:

The first week of the month, the LSST Project Controls Specialist creates an "extended" progress report, which indicates the progress of all the activities and shows any Earned Value variances.

The second week of the month, the DM CAMs submit narrative to the DM Project Manager, describing both the last months accomplishments and the next months plans. The CAMs also submit narrative explaining any EV variances that are above a defined threshold.

The third week of the month, DM Project Manager assembles both an Extended Report containing all detailed narratives for each institution, and a Summary Report which excerpts high-level accomplishments and plans across DM institutions. The Extended Reports have been examined every year by Federal auditors to check that the DM Project Manager is monitoring the work performed/progress by each contracted DM institution. The Summary Report is prepared for submission to senior management and for inclusion in the monthly report to the AMCL. The DM Project Manager posts both report in DocuShare.

The fourth week of the month, the LSST Project Manager and Project Controls Specialist prepare and submit the report to the funding agencies. These reports are also included in the quarterly and annual reports to the funding agencies.