

Summit Software Team

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1 Introduction

As we approach operations of Vera C. Rubin Observatory we need to take stock of our software items. Many tools have been developed which were not well specified in requirements, some examples are listed in section 2. Some have been developed by Data Management (DM) and some within System Integration, Test and Commissioning (SITCOM). Most of these appear on the summit, a location DM was never intended to have a large foot print.

We feel a new team, possibly titled *summit software team*, is needed to take care of these items. This would require some new effort and reposition some current staff.

2 Potential items not covered in Operations

In the November 2023 DMvF2F several items were identified as not falling in DM scope. There are other items which have appeared on the summit, are useful, but have unclear owners in operations. SITCOM is also building more functionality with no clear owner/maintainer in operations.

This is a list of some of these items which a summit software team might improve and maintain:

2.1 RubinTV

RubinTV has been developed in SITCOM, there have been no reviews and there is a sole maintainer. This will certainly exist through operations and should be owned, reviewed and maintained by more than one person. This is somewhat being looked at by FIG SITCOMTN-059.

2.2 Summit Quality Assurance (QA) tools

SITCOM-700 is a missing functionality ticket in this area.

In DM a QA working group was setup in 2018 [LDM-622] which reported in 2019 DMTN-085. DM dealt mainly with tooling and considered pipelines - some of that tooling may end up on the summit especially derivatives of the metrics framework DMTN-098.

In any case there will be pipeline code running on the summit producing QA outputs which a summit team should be able to configure/update/maintain.

There are also performance tools from RPF.

2.3 Reporting

There are several types of reporting from operator logs to end of night reports. A technote from Frossie is due on this.

2.4 Camera Visualization

Tony built a tool for previewing camera images - we believe is this going to be on the summit ? There are camera diagnostic machines available to run it and other camera specific diagnostics. There are Camera developers (or one at least) to be added to the Observatory team in operations to support this.

2.5 OCS Controlled Pipeline System (OCPS)

OCPS [DMTN-133] was written by DM but is not obviously a DM maintenance job.

2.6 Header Service

DM put this in place as it was needed but it was not really DM functionality. There was discussion of camera providing this but camera now use this service to get the header.

2.7 Exposure Log

This has been ill defined and worked on by many. It is currently tied up in the Consolidated Database [DMTN-258]

2.8 Exposure Log insertion at United States Data Facility (USDF)

This probably should be USDF

2.9 Engineering and Facility Database (EFD)

EFD this is the biggest item provided by DM - it should probably stay with SQuaRE but DM was never sized for 24/7 support.

3 Suggested team

In section 2 some software products are listed which a team could potentially look after. These are all summit support items which are used and needed for operations. They are a mixture of front and back end capabilities and would require interaction with TSSW and DM. So this team would be a DevOps type team with full stack capability and skills to debug all levels on the summit.

There are a few people in T&S already working in the or related areas, such as Rob, Michael, Sebastian, Tiago and Merlin. However all have other roles/jobs so we believe there is a shortage of at least one full stack engineer and more likely two in this area.

If this software is to be supported on call and 24/7 the team would need to be much larger.

3.1 Where would the team sit

TSSW is the closest to this topic so it should be a group in TSSW under Andy Clements. Michael Reuter would make a good team lead for this - provided we give him the required resources. Tiago Ribeiro would be an obvious product owner - even if he is quite involved. This is completely analogs to similar setups within DM Pipelines.

It is not clear if there is an equivalent NSF's National Optical-Infrared Astronomy Research Laboratory; <https://noirlab.edu> (NOIRLab) structure for summit support software which a mixture between Science processing, QA tools, monitoring and control software.

3.2 Overall software management

A further topic for discussion is the overall coordination of software in Vera C. Rubin Observatory Operations - a role not currently in the operations plan and for which an Joint Operations Review recommendation remains pending PREOPS-3521.

In construction William O'Mullane has the role of deputy Project manager for software. This may be crisply defined as being responsible for all IT and Software on the project. The construction role is outlined in ???. A potential role in operations is discussed in subsection 3.2.2

3.2.1 Construction - Deputy PM-Software & IT

Document-25351 defines this as follows:

- Roles
 - Facilitate all software decision making across the project.
 - Facilitate all IT decisions across the project.
 - Manager of managers for software and IT roles – even if such managers are in different subsystems.
 - Mentor senior IT and Software personnel.

Responsibilities

- Though a large fraction of software on the project is in Data Management there is also significant software in Telescope & Site and Camera. The project manager delegates responsibility Deputy PM is responsible for the smooth running of software in all subsystems.
- Ultimately, the DMPM, in conjunction with his/her peer Project Managers (Telescope, Camera), is responsible for delivering an integrated Rubin system.

- The Deputy Project Manager has the responsibility for resolving conflicts involving IT and Software between IT, T&S, Camera and DM.
- The Deputy PM as a manager of managers is responsible for obtaining and maintaining managers in senior software management roles. Specifically head of Telescope and Site Software, IT Chile IT Tucson and Data Management.
- Assist software managers in definition of scope, funding requests, risk management and mitigation.
- Ensure compatible and where possible similar work and management practices for software across subsystems.
- Assist with reviews and review preparations from a software perspective.
- Provide leadership to senior managers involved in IT and Software across Rubin.
- Foster a good, equitable, diverse and inclusive working environment within Rubin.
- Authorities
 - In the absence of the PM the deputy carries full authority and decision making powers of the PM.
 - Approve or execute as appropriate all Software/IT outsourcing contracts.
 - Approve or execute as appropriate all IT equipment and licensing purchases.
- Accountabilities
 - Budgeting of software and IT across Rubin should be monitored.
 - Decisions made on software and IT especially across subsystem boundaries.
 - Actions and decisions of senior software and IT managers across Rubin Specifically head of Telescope and Site Software, IT Chile IT Tucson and Data Management.

3.2.2 Operations Software

In Rubin Operations the head of software is under discussion. Such a role needs to be at the directorate level, as it is in construction, so it is out side any given department. Trimming down the construction role we might consider:

- Roles

- Facilitate all software decision making across the project.
- Facilitate all IT decisions across the project.
- Manager of managers for software and IT roles – even if such managers are in different departments.
- Mentor senior IT and Software personnel.

Responsibilities

- Responsible for the smooth running of software in all subsystems.
- Responsible for maintenance of the over all Rubin software system in conjunction with the various software leads/managers.
- Responsible for resolving conflicts involving IT and Software between IT, ROO, RPF, EPO and DM.
- Responsible for obtaining and maintaining managers in senior software management roles. Specifically head of Software in ROO and RPF, DevOps Chile, IT Tucson and Data Management.
- Assist software managers in definition of scope, funding requests, risk management and mitigation.
- Ensure compatible and where possible similar work and management practices for software across subsystems.
- Assist with reviews and review preparations from a software perspective.
- Provide leadership to senior managers involved in IT and Software across Rubin.
- Foster a good, equitable, diverse and inclusive working environment within Rubin.

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• Accountabilities

- Budgeting of software and IT across Rubin should be monitored.
- Decisions made on software and IT especially across subsystem boundaries.
- Actions and decisions of senior software and IT managers across Rubin Specifically head of ROO Software, DevOps Chile, RPF software leads, IT Tucson and Data Management.

A References

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- [DMTN-133]**, Jenness, T., 2020, *OCS driven data processing*, DMTN-133, URL <https://dmtn-133.lsst.io/>,
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- [DMTN-258]**, Slater, C., 2023, *Summer 2023 Crowded Fields Status*, DMTN-258, URL <https://dmtn-258.lsst.io/>,
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B Acronyms

C Glossary

Camera The LSST subsystem responsible for the 3.2-gigapixel LSST camera, which will take more than 800 panoramic images of the sky every night. SLAC leads a consortium

of Department of Energy laboratories to design and build the camera sensors, optics, electronics, cryostat, filters and filter exchange mechanism, and camera control system.

Commissioning A two-year phase at the end of the Construction project during which a technical team a) integrates the various technical components of the three subsystems; b) shows their compliance with ICDs and system-level requirements as detailed in the LSST Observatory System Specifications document (OSS, LSE-30); and c) performs science verification to show compliance with the survey performance specifications as detailed in the LSST Science Requirements Document (SRD, LPM-17).

Data Management The LSST Subsystem responsible for the Data Management System (DMS), which will capture, store, catalog, and serve the LSST dataset to the scientific community and public. The DM team is responsible for the DMS architecture, applications, middleware, infrastructure, algorithms, and Observatory Network Design. DM is a distributed team working at LSST and partner institutions, with the DM Subsystem Manager located at LSST headquarters in Tucson.

DM Data Management.

EFD Engineering and Facility Database.

monitoring In DM QA, this refers to the process of collecting, storing, aggregating and visualizing metrics.

NOIRLab NSF's National Optical-Infrared Astronomy Research Laboratory; <https://noirlab.edu>.

OCPS OCS Controlled Pipeline System.

Operations The 10-year period following construction and commissioning during which the LSST Observatory conducts its survey.

QA Quality Assurance.

Quality Assurance All activities, deliverables, services, documents, procedures or artifacts which are designed to ensure the quality of DM deliverables. This may include QC systems, in so far as they are covered in the charge described in LDM-622. Note that contrasts with the LDM-522 definition of "QA" as "Quality Analysis", a manual process which occurs only during commissioning and operations. See also: Quality Control.

Review Programmatic and/or technical audits of a given component of the project, where a preferably independent committee advises further project decisions, based on the current status and their evaluation of it. The reviews assess technical performance and maturity, as well as the compliance of the design and end product with the stated requirements and interfaces.

SITCOM System Integration, Test and Commissioning.

software The programs and other operating information used by a computer..

stack a grouping, usually in layers (hence stack), of software packages and services to achieve a common goal. Often providing a higher level set of end user oriented services and tools.

USDF United States Data Facility.

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