Project Name:		
Sequence Model Update Feasibility Study		
Business objective served by this project		
Prepare the way for large-scale changes to the science program sequence model that will ease the science support burden, simplify program creation, and permit advanced features such as automated queue planning.		
Project Manager/Leader:	Project Sponsor:	PDS Version/Date:
Shane Walker	Gustavo Arriagada	3 / 2010-10-20

Project Description

Issue Statement:

Progress on many important improvements to science program preparation and queue planning has been stalled for many years because of deficiencies in the underlying software model that represents observation execution sequences. Just a few items where we cannot make significant progress today include:

- Combining acquisition sequences and science observing sequences in a single observation, obviating the need to create, configure, and check multiple observations.
- Inclusion of a “Smart GCAL” component that handles complex calibration configuration automatically, saving both PI and staff effort.
- Including all overhead times, especially for calibrations, in order to improve the accuracy of Phase 2 preparation and queue planning
- Improving the reporting on and editing of large numbers of observations, saving PI, NGO, and staff effort in preparing and checking Phase 2s
- Adding logical constraints across observations that will help a queue planning tool to automate decision making.

Reworking the sequence model will unlock many potential improvements that we cannot consider otherwise, and is critical to prepare the way for major transition projects such as the PIT/OT integration and automated queue planning. At the same time, it is not a task to be undertaken lightly. The science program model is the foundation of many high-level tools that are in use daily at the observatory and in Gemini’s community of observers. Modifying the model has a ripple effect that extends to all corners of the Observatory Control System.

The purpose of this project is to clarify user requirements not only for major missing features like Smart GCALs, but for many existing features that have accumulated over the years that may or may not be useful today. The output of this project will be user requirements documentation and a solid understanding of what changes are needed going forward.

Project Objective Statement (POS):

There are two major objectives of this project, each with an accompanying deliverable

- Survey and document existing features both to verify that they are still needed and to serve as a baseline for evaluating future strategies. In this phase, we will produce a Functional, Architectural, and Operational Inventory document that will be used to help guide the subsequent user requirements gathering and architectural vision phases. The inventory should identify areas where requirements might have changed, or implementations might have been made under false assumptions. Clarifying these areas first instead of focusing solely on new or missing functionality will help ensure the success of the project.
- Document user requirements in the form of a "Functional Vision" document. This is a deliverable of the science working group charged with providing requirements. This phase should lay out the vision of the science staff, address issues that are raised from the generation of the Functional, Architectural, and Operational Inventory, and describe newly-discovered hard requirements that are likely to need particular attention.

Software effort will be needed throughout but at a lower level during the requirements gathering phase. Software is involved in order to better understand the motivation for the requirements produced, to help guide the document away from implementation specifics, and to review the content and provide a technical assessment.

Project Flexibility:

Flexibility Matrix	Least Flexible	Moderately Flexible	Most Flexible
Scope		✔	

Flexibility Matrix	Least Flexible	Moderately Flexible	Most Flexible
Schedule			✔
Resources	✔		

Major Deliverables:

This project focuses on requirements gathering. There are two major deliverables, both in the form of project documentation that will serve as input during future design and implementation phases. As discussed above, these are the

- Functional, Architectural, and Operational Inventory document detailing existing high-level features.
- Functional Vision user requirements document.

Assumptions:

- No software will be generated as a result of this project. The deliverables of this project will be used as input for subsequent design and implementation phases.
- At least one senior software engineer who is intimately familiar with the existing sequence model is required for project success. At least two engineers should be involved to prepare the way for future implementation stages, serve as a springboard for ideas, and provide a sanity check.
- A large portion of this phase of the project is the responsibility of science, who must provide the resources to help sort out and document user requirements. A small group of interested scientists will be charged with this task.
- There will be regular points of interaction between science and software during the requirements gathering phase.
- Software will be involved during the requirements gathering phase to ensure that the requirements are well understood and focused on specifying user needs.

IS and IS NOT:

- **IS:** Focused on understanding what needs to be done and documenting it.
- **IS NOT:** Focused on implementing anything.
- **IS NOT:** The sole task of any software developer for the entire period of this project.

Strategy and Resources

Milestones and Stages:

There are two major stages of this project, one that primarily involves software engineering effort and one that primarily depends upon on science staff. The stages correspond to the two major deliverables

- Evaluation Phase (Software)
  - Identify existing feature set.
  - Identify weaknesses in current model.
  - Create the Functional, Architectural, and Operational Inventory
- User Requirements Gathering (Science + Software)
  - Form science team charged with writing user requirements, clarify goals and scope.
  - Create the Functional Vision.

Estimated Costs:

- No equipment or resources beyond those afforded for normal software development.

Core Team Members(see Guidelines for Developing New Projects document):

- Shane Walker (Project Manager)
- Bryan Miller (Project Scientist)
- Manuel Lazo ? (Systems Engineer)

Extended Core Team Members:

- Larry O'Brien
- TBD science staff

Dependencies that require coordination:

- Dependencies on the time of software staff involved in the project vs. day-to-day maintenance of software and participation in other transition projects.
- The output of this project provides input for the Observing Database replacement design study, the Phase I / Phase II Integration study, and the Queue Planning automation project.

Risks and Issues:

- The major risk that this project faces is ensuring sufficient staff effort will be available.

Supplemental Resources:

- None