

Forefront Access to the Universe



Gemini Observatory
Software Development Project

Course Project

- **This is a semester-long project (starting today!)**
- **Account for 30% of your total score (do a good job on this!)**

Introducing Estcium Company



You?

**Junior
programmers
and junior
system
analysts!**

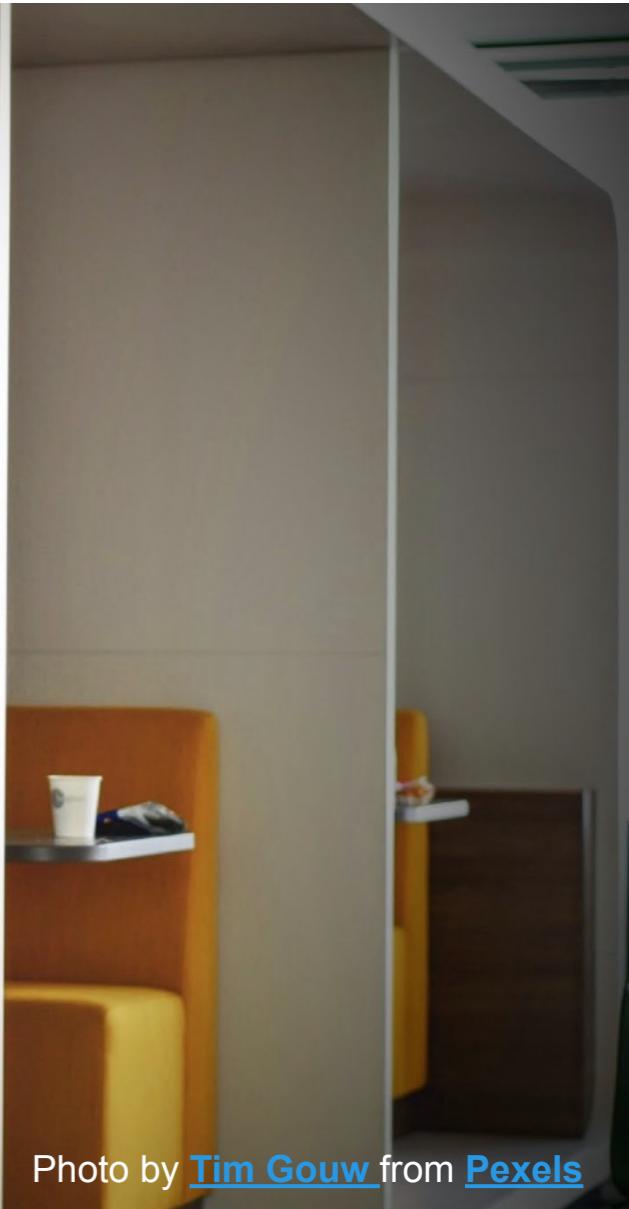


Photo by [Tim Gouw](#) from [Pexels](#)

Our Customer

The Gemini 8-m Telescopes Project

[http://
www.gemini.edu/
project/intro.html](http://www.gemini.edu/project/intro.html)

Eric Horst, flickr

Gemini Northern 8m Telescope

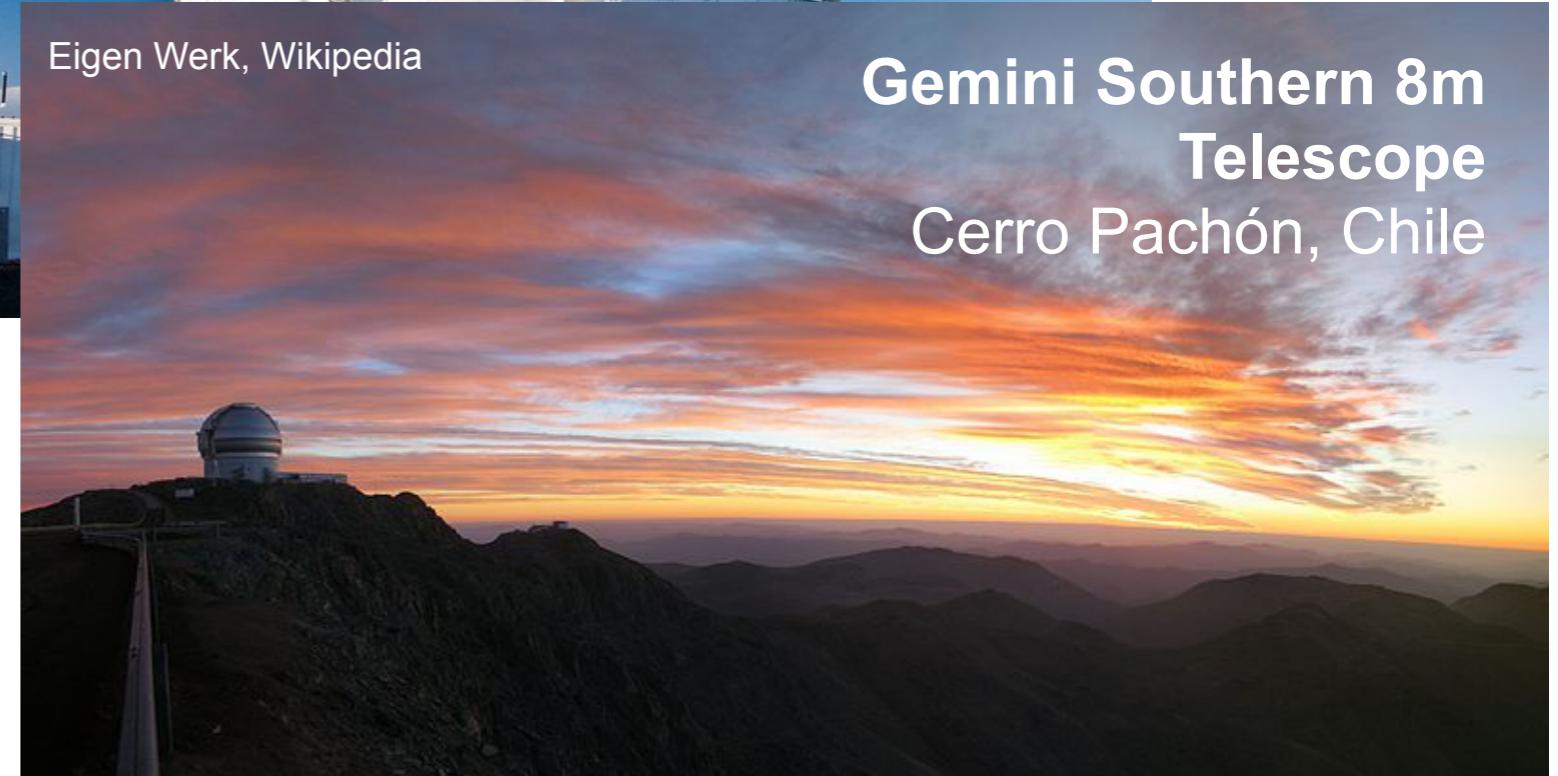
Mauna Kea summit, Hawaii



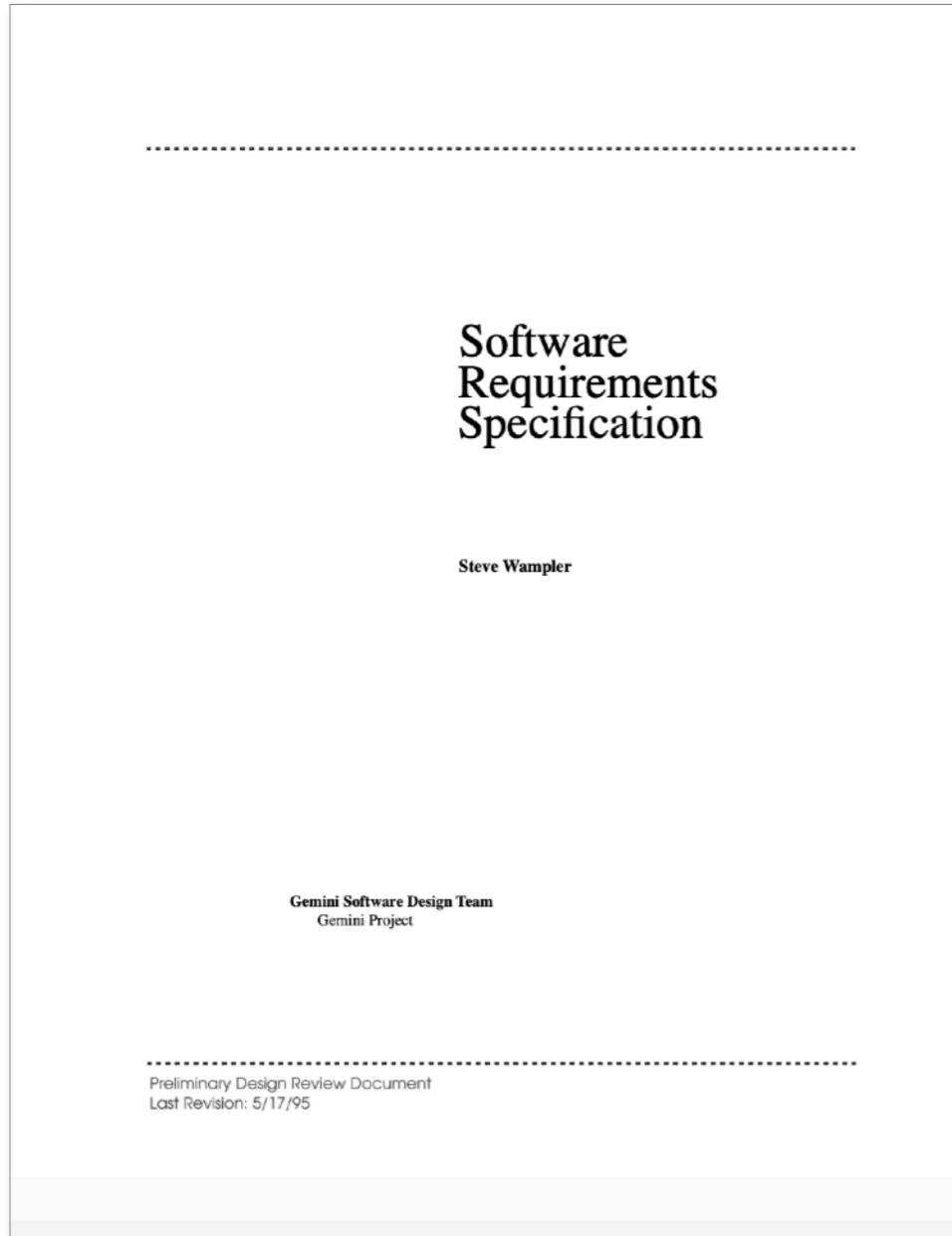
Eigen Werk, Wikipedia

Gemini Southern 8m Telescope

Cerro Pachón, Chile



We've Got You the SRS!



**Software
Requirements
Specification**

Steve Wampler

Gemini Software Design Team
Gemini Project

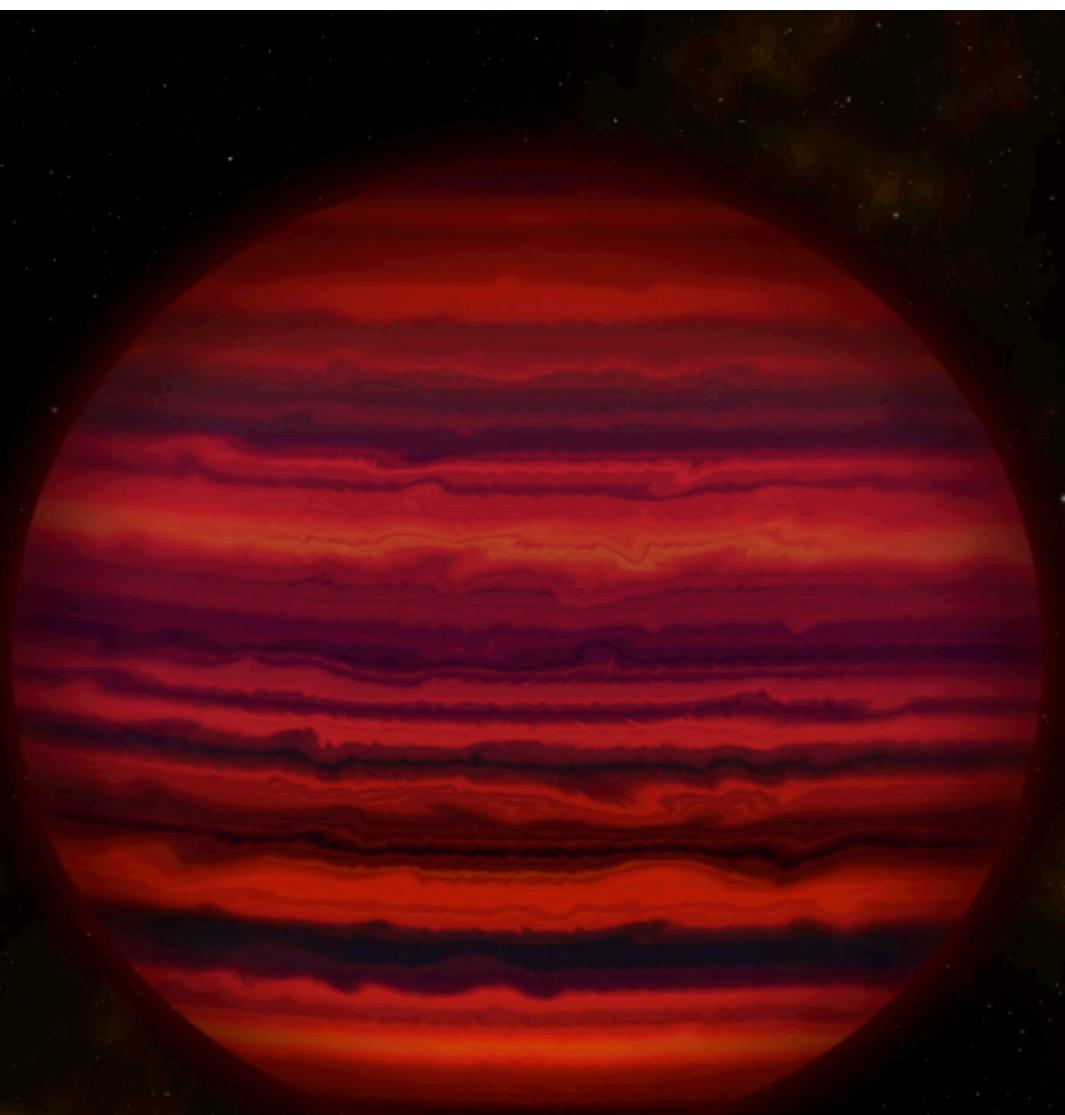
Preliminary Design Review Document
Last Revision: 5/17/95

It's 96 pages by the way ...

What Do **We** Have To Do?

- 1. We'll work together in a big team (the whole class).**
- 2. Each group study the SRS very carefully.**
- 3. We'll design the use case diagram of the whole system.**
- 4. Each group will be assign a number of use cases.**
- 5. You apply the methods/techniques learned in the class to design the Gemini software according to the requirements.**
- 6. I and Aj. More will be there to help you ☺.**

Images from Gemini



Imágenes Históricas del Observatorio G

Gemini Observatory



Sunset Over Gemini North, Mauna Kea, Hawai'i



Gemini South atop Cerro Pachon, Chilean Andes

Organization Gemini Consortium ([NSF-US](#), [NRC-Canada](#), [CONICYT-Chile](#), [MCTI-Brazil](#), [MCTIP-Argentina](#)) and [AURA](#)

Location Mauna Kea Access Rd, [Hawaii](#), U.S.
[Cerro Pachón](#), Chile

Coordinates  19.82396°N 155.46984°W
 30.24073°S 70.73659°W

Altitude 4,213 m (13,822 ft)
2,722 m (8,930 ft)

Established 2000

Website www.gemini.edu 





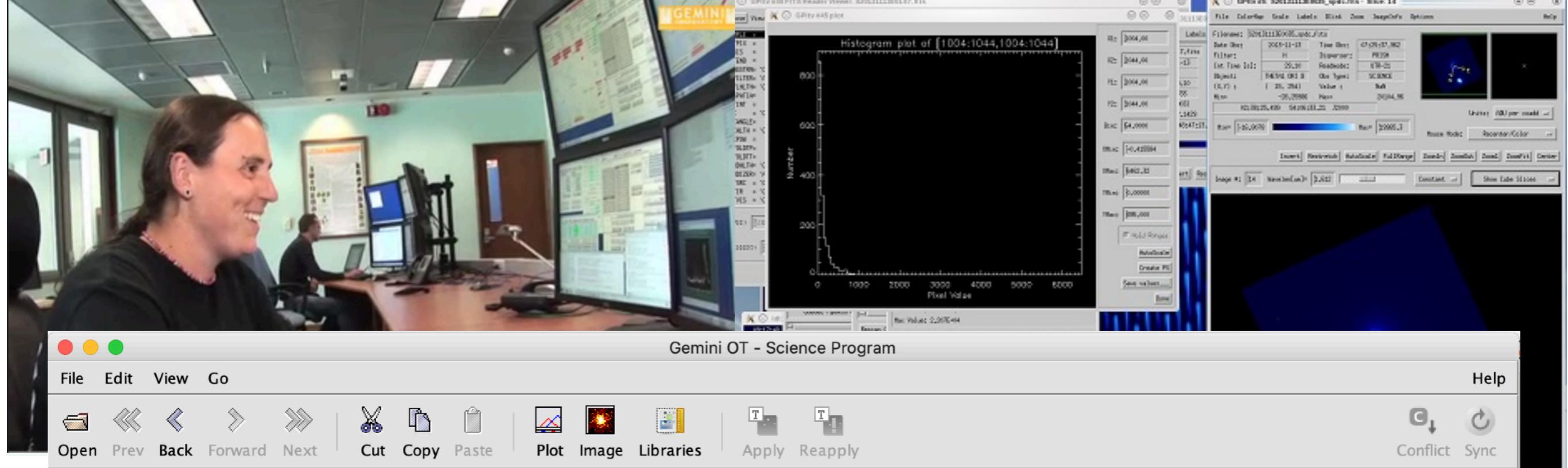
Cerro Pachón

Camino Centro Astronomico

Project Scope

- The Observatory Control System (OCS) was lunched in 2000.
- AURA* wants Estcium to improve the software modules that interface with users (e.g. observer).
- The core functions of OCS will be operated by the existing system.

* the Association of Universities for Research in Astronomy (AURA)



The screenshot shows the Gemini Observatory Control (Gemini OT) software interface for a Science Program. The main window displays the details of an observation named "NICI Observation".

Observation Details:

- Observation Name:** NICI Observation
- Observation Id:** (not explicitly shown)
- Priority:** High
- Status:**
 - Phase 2 Status:** Phase 2
 - Exec Status:** Pending Phase 2 Completion
 - QA State:** Undefined
 - Dataflow Step:** No Data
- Observing Time:**
 - Class:** Science
 - Setup Type:** Full Setup (10 mins)
 - Planned:** 00:10:08
 - Elapsed:** 00:00:00

	Program	Partner	Non-charged	Elapsed
Total	00:00:00	00:00:00	00:00:00	00:00:00

- Time Correction Log:** A table with columns: Timestamp, Correction, Charge Class, Comment.

Toolbar: Includes Open, Prev, Back, Forward, Next, Cut, Copy, Paste, Plot, Image, Libraries, Apply, Reapply, Conflict, Sync, and Help.

Sidebar: Categories include Observation, Group, Note, Component, Iterator, and Observe, each with corresponding icons.

Right Panel: Shows a "Problems" section with a red X icon.

Status & Alarms Summary

Observatories

	<i>URL State</i>	<i>OVR State</i>	<i>Laser Sensitive</i>
<i>ALO</i>	OK	NO	NO
<i>GEMINI</i>	OK	NO	NO
<i>SOAR</i>	OK	NO	NO

Lasers

	<i>Laser State</i>	<i>Shutter Event (site,duration)</i>	<i>Predictions (number, site list)</i>
<i>GEMINI</i>	On-Sky	None	None
<i>SOAR</i>	Off	None	None

Collisions

<i>Laser</i>	<i>Scope</i>	<i>Started</i>	<i>Ends</i>	<i>Priority</i>

Laser "ON" Preview (Predictions & Collisions)

<i>Laser</i>	<i>Scope</i>	<i>Starts</i>	<i>Ends</i>	<i>Priority</i>

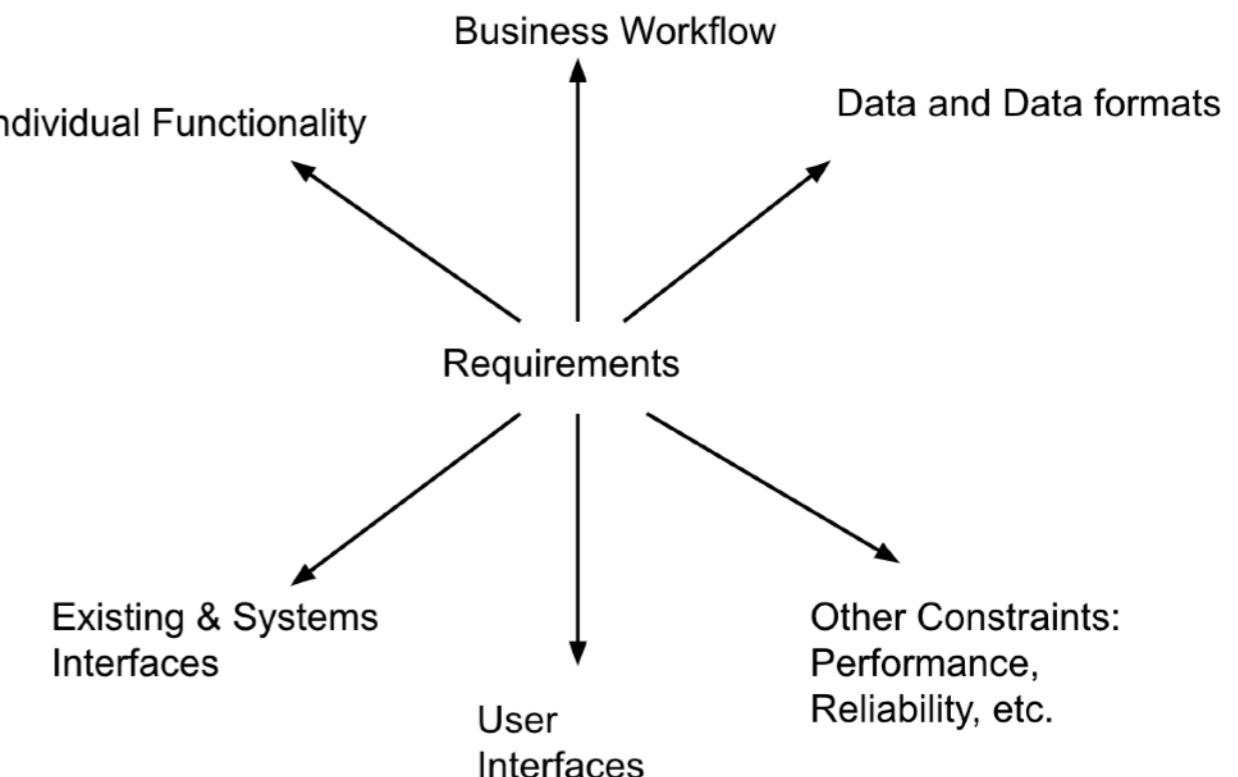
Project Constraints

- The existing system has poor documentation.
- This is an offshore project where the developer team located in Thailand.
- The project involves knowledge specific domain (i.e. extremely large telescope management system)

Extract Requirements

- Identify actors
(e.g. user, observers)
- Identify functional/non-functional requirements
- Identify users' scenarios

6-Dimensions of Detailed Requirements Elicitation



Gemini: Software Requirements specification

Software Requirements Specification

Steve Wampler

Gemini Software Design Team
Gemini Project

Preliminary Design Review Document
Last Revision: 5/17/95

SRS structure

General description

System users
Operation levels
Access modes
User-level requirements
Operational context

General requirements

Data specifications
Operation details
External interface requirements
General constraints

Specific Requirements

System attributes
Control requirements
Maintenance

Commands

Command mode requirements

Example of SRS

2.1 SYSTEM USERS

The users of the Gemini system are classified into the following categories.

- A. Astronomer.** This person is using the Gemini system for the collection of science data. In a very real sense, the astronomer is the customer for the services provided by the Gemini telescopes. The astronomer has worked out, with the Gemini system, a science plan for the collection of the data. This science plan may include interactive observing.
- B. Science observer.** This is the on-site person responsible for monitoring the data acquisition and validating the data integrity being collected for the astronomer, as well as ensuring that the science plan is functioning to the needs of the astronomer.
- C. Telescope Operator.** The on-site controller of the telescope and instruments. This person is responsible for ensuring the integrity of the system and for keeping the system functioning accurately during observations. The Telescope Operator works with the Observer and the science plan to produce as good data as is possible.
- D. Support.** On-site (or near-site) support personnel are responsible for the maintenance of the system, hardware and software, as well as the installation of subsystems and configuration changes.
- E. Developer.** Developers are responsible for the designing, testing, configuring, and upgrading of subsystems.