Designing the APT Help System

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One of the main goals of the Astronomer's Proposal Tool (APT) project is to "provide documentation/help that is friendly, up-to-date, and easily accessible to users of varying levels of expertise." (*APT: HST Proposal Preparation Environment for the Second Decade*, 1999, A. Koratkar, N. Bernstein, R. Douglas, A. Gerb, J. Jones, K. Peterson, R. van der Marel). To help achieve this the APT help group (S. Lubow, E. Hopkins, N. Gaffney, G. Curtis, S. Hulbert and J. Younger) used an Information Architecture (IA) process -- a method originally used for designing web sites -- to design an APT help system. This report describes the results of using this process.

The Information Architecture (IA) Process

The IA process breaks down the design of a help system "site" into five steps -- each step usually requiring several iterations. They are:

1. Define the system's goals
2. Identify the users and their needs
3. Identify the content and functional requirements
4. Define the structure of the help system
5. Design the site appearance

The APT help group worked through the first four steps, which resulted in a proposed structure for the APT help system that includes how a user might navigate in it.

Help System Goals and Objectives

What are the APT help system's goals? Perhaps they seem obvious to some, but how many help systems have you seen where help is more like a no-help system? Let us count the ways. These goals should be fairly general, but concrete. We should have clear, documented ideas of what we want the help system to do; it insures that everyone is "on the same page."

 These are some of the questions we used.

- What is the mission or purpose of APT (see APT Web Page)?
- What are the short and long term goals of APT help?
- Who is the intended audience (i.e., the users of the system)?
- Why will people use APT help?

The APT Help System Goals

Each member of the help group wrote down a ranked list of what he thought the goals and objectives should be, and then we discussed them. After several discussions and iterations within the group, we solicited feedback from the APT user group and from Hubble Division management. Then we settled on a final list in order of priority.

The APT Help system will:

1. Provide basic assistance to users for creating a Phase II Proposal

2. Provide basic assistance to users for creating a Phase I Proposal

3. Provide complete, timely and correct information

4. Use a single source of information, and that this source will consist of existing documentation (e.g., Instrument Handbooks, Phase II Instructions, Call for Proposals, etc.) whenever possible.

5. Provide instructions to deal with error messages or any problems with APT that prevent proper processing of a proposal

6. Help users with problems running the tool itself (i.e., software problems with the APT Help System)

7. Provide help with the installation and maintenance of APT

8. Be easy to maintain

9. Provide for all instrument modes physical characteristics required for carrying out a science program (e.g., aperture throughputs)

10. Provide access to the Proposal Instruction references (e.g., the Call for Proposals and the Phase II Proposal Instructions)

11. Provide information to proposers and STScI staff who assist in proposal preparation

12. Provide guidance for optimizing a Phase II proposal

13. Provide a cookbook (i.e., a step by step tutorial) for creating a basic Phase I Proposal

14. Provide a cookbook (i.e., a step by step tutorial) for creating a basic Phase II Proposal

15. Provide science strategies for using different instrument observing modes

16. Provide guidance for using APT to explore possible science observing programs

User Groups and Their Needs

One of the questions we used to help define the APT help goals and objectives was: who is going to use the APT help system? We tried to identify their needs by creating user scenarios (role-playing through telling stories) and conducting interviews with potential users. If we discovered that we left something out of our list of goals and objectives, or if we decided an item needed a higher ranking, we modified the final goals and objectives list.

We identified the following user groups in order of priority.

1. Experienced General Observers

2. Program Coordinators

3. Guaranteed Time Observers

4. Instrument Scientists

5. Inexperienced General Observers

6. Archive Proposers

7. Archive Users

User Scenarios

Each member of the APT Help group took on a role of a prospective user based on our user list -- experienced and novice GOs, an Instrument Scientist, a Program Coordinator and an Archive proposer. This role-playing consisted of telling a story about the user, describing their backgrounds and experience, and then had them set out to do a task where APT help would be needed. The purpose of this exercise to try to insure that we haven't left out anything in our goals and objectives which may be quite important in achieving the task of writing a proposal for HST, or for that matter, any observatory. Sometimes the results of this role-playing could be quite surprising, revealing needs that were not anticipated in our original list of goals and objectives. The results are reflected in our final list of goals and objectives.

Here is an example of one of the roles group members played with a group discussion following the description.

User Scenario Example: Novice GO by Niall Gaffney

Scenario Description: Dr. Drake Ramore Sr. is a world renowned astrophysicist who specializes in models of white dwarfs and planetary nebulae. He is planning to retire in four years from his professorship at a small liberal arts university in the California system and hence has not taken any new students on. His last student has left for a professorship in East Elbonia just after they were awarded ACS time on HST and cannot help him significantly with this new technology. Having never used a telescope other than the Hale 200 inch (where he is a regular observer) he is on his own now.

He wants to use the HST imaging to explore the nature of nebulae in distant galaxies. First he must find them in these galaxies. He needs to be able to take the filter profiles to use with his own nebulae modeling program (written in Forth, the only programing language he knows how to use) to derive the several color color diagrams to isolate the brightest planetary nebulae in these galaxies (which have a wide range of velocities). Once he has selected the list of galaxies (with their red shifts) and folds in the filter band passes in his program, he will need to take the output from the models and use them to determine the required exposure times on these objects needed to get photometric accuracy needed to isolate these nebulae.

A year later his program is so successful he is awarded more HST time to do follow-ups. With nebulae in hand, Drake will need to take the images he has reduced (again using routines written in Forth) using special techniques to emphasize the planetary nebulae. He has found that most of these galaxies have fairly bright nebulae that are partially obscured by the surrounding galaxy. To best utilize his time, he wants to use his ACS images to mark the nebulae and find optimal alignments for the COS slit to

get spectra of as many of these objects as possible in one orientation on each galaxy. He then wants to take his photometry of the objects and their surrounding galaxy and model the exposure time he will need to get a signal to noise high enough to measure the galaxy's emission as well as the emission from the nebulae to isolate the nebulae spectra.

He launches Netscape for the first time in three months to find the information he needs and types in http://www.stsci.edu.

Interviews with Potential Users

As with the user scenarios, interviews with actual users of the proposal submission and processing system serves the purpose of making sure we haven't left anything out. What better way is there than to ask people who either write or help GOs write proposals for HST?

These interviews emphasized the need for the following items:

- A trouble-shooting guide for the most common problems would be very useful
- All URL links should work and are up-to-date
- The information provided must be up-to-date
- The navigation within the help system should be clearly marked and the desired information easy to find
- The help system should have a relatively fast response time

The following is an example of such an interview.

Interview Example: Program Coordinator, Patricia Royal (March 2001)

- **Question**: Do you use a proposal writing help system that's currently available (e.g., RPS2, which has context sensitive help)?
  Answer: Rarely, but I could see new PCs using it during training.

- **Question:** What are the most common problems you encounter during Phase II proposal writing (Note: PCs are not involved with the Phase I proposal writing)?
  Answer: The most common problem is helping GOs deal with lack of guide stars for some of their visits. The second most common problem is an unschedulable visit, which usually is due to user imposed scheduling requirements (orientation or timing requirements). Often, these two problems are interrelated; a user imposes an orientation and timing requirements on a visit, which in turn doesn't have guide stars for that particular range of orientations and times.

- **Question**: What information do you use most often while helping or troubleshooting a proposal?
  Answer: The Phase II Proposal Instructions. Occasionally, I use the Instrument Handbooks, but usually, if it's an instrument specific question, I refer the GO to an Instrument Scientist.

- **Question**: When you go to the Phase II Instructions, how do you get to it?
  Answer: For the GO version, I go to the Observing Page where there's a link to the Phase II Instructions (pdf version). For the Engineering version, I go to the main PC page (an internal page).

- **Question**: Can you find what you are looking for? Is it easy, difficult or impossible?
  Answer: This year it seems degraded (finding information) compared to last cycle (cycle 9). The sections are no longer numbered in the Phase II Instructions, and links in the documentation and on the proposal preparation web site don't work (as often).

Content and Functional Requirements

Once we established our goals, and have gotten a sense of what potential users would like to see and do, we tried to write down anything we could think of regarding how APT help should behave and what information it should provide. What pieces of content does the system need? What sorts of functionality will be required? We used the goals and objectives list as a "filter" to rank the relative importance of these content items. During this step we conducted several brainstorming sessions within the group and one with the APT user's group. During these session we

- made an inventory of all possible content elements. If someone brought it up, we put it down

- made a list of functional requirements (i.e., how will the help system behave).

The following sections list these content and functional requirements. Please note that the manner and order that these items are organized does not reflect any priorities. At this point in the process, all items are equal. But we will discover in the subsequent step of laying these items out into interrelated blocks, we will discover that some items are more equal than others.

APT Help Content

Observatory and SI Information

- observatory comparisons
- filter positions
- spectral elements positions
- grating positions
- overheads
- si foibles

- si comparisons and descriptions
- fitter throughputs
- spectral elements throughputs
- aperture dimensions
- overhead sources

Target Information

- fixed targets

- moving targets

Proposal Information

- policies
- available modes
- supported modes
- what is this special requirement?
- schedules
- submission status
- quick reference sheets for getting started and for problem solving
- visit schedule

- observing templates
- restricted modes
- optional parameters
- what are all of the special requirements?
- deadlines
- information on innovative programs
- visit status

Resources

- email addresses
- phase 2 instructions
- phase 1 instructions
- hst primer
- digital sky survey
- simbad
- MOSS
- pcs
- merle

- target position references
- instrument handbooks
- call for proposals
- guide star catalog
- starview
- HIC/HOC
- commandos
- instrument scientists
- s/w developers for installation

- s/w documentation
- TReD?

- spso

"How to" Information

- how to do target acquisitions
- overhead algorithm
- calibration accuracies
- strategies
- troubleshooting guide(s):
- common problems, possible causes, and suggested solutions
- worked examples (for different user groups and kinds of science)

- resource estimations
- scheduling algorithm
- recommendations
- optimizations
- guide stars guide

- error explanations

APT Help Functionality

- icon/tool help
- "cheat" sheets for each major resource
- simple to do information updates

- fuzzy searches
- access to html versions of information
- portability (both the documentation and software)

- gui help
- easy access to what's new
- Search function that is content specific, has the ability to turn on/off different sources of information and to change the range of search

- access to paper copies
- access to pdf versions of information
- menu of available documents (with a guide)

System Structure

After these brainstorming sessions we wrote all of the items on separate index cards (actually yellow stickums); then each member independently organized and arranged these items into what they considered to be logical groupings. We then met and discussed the individual groupings and tried to come up with a consensus of where the content items should be in the help system and how users would navigate within the system and use the information.
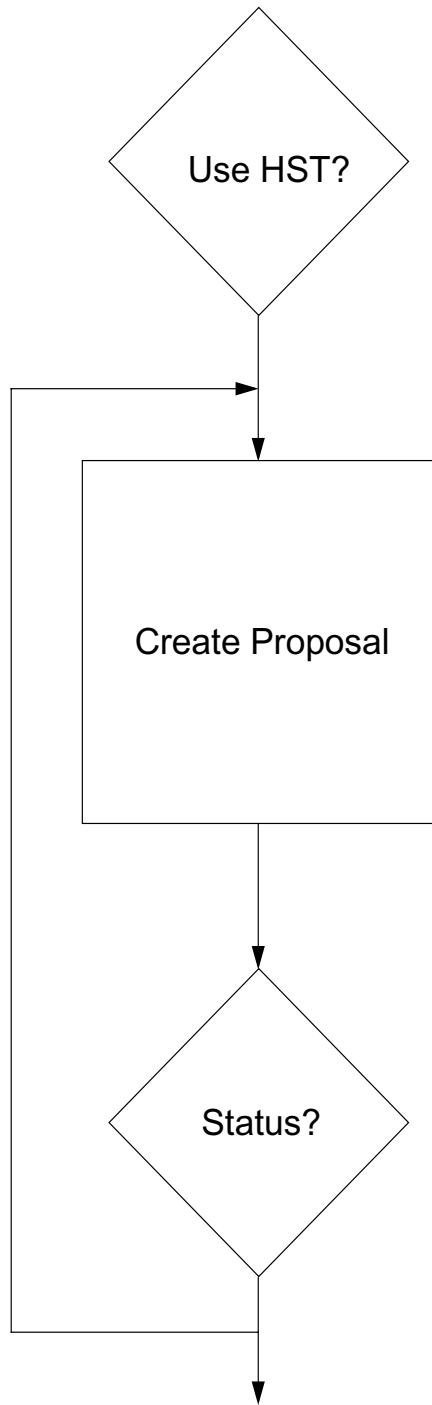
Figures 1 through 5 shows how the APT help system would be structured. It is a skeleton or blueprint of how the APT help would be organized. It also shows how users would navigate within this system.

Figure 1 presents an overall view of APT help, from the initial decision of whether to submit a proposal for HST time to the "final" activity of determining the status of a proposal. The proposal status block would include both "Phase 1" and "Phase 2" information. This figure also shows a view of items that would be available regardless of where the user might be in APT help.

Figures 2 through 5 present expanded views of each block in Figure 1.

- Figure 2 expands the decision making block where a user decides if HST is the appropriate observatory to carry out an observing program. It includes a "local" list items that would be available while in this block.

- Figures 3 and 4 expand upon the create proposal block. Two figures were used to show that the content needed to create a proposal is three-dimensional. Figure 3 shows a diagram of science instruments versus the components of an observing program (program or proposal components). Figure 4 shows the third axis of content items that would be available for each cell of program component and science instrument.

- Figure 5 shows an expanded view of the proposal status block, including a list of "local" content items available to the user.

Figure 1: Overall View of APT Help System

Figure 2: Expanded View of Use HST Decision Block
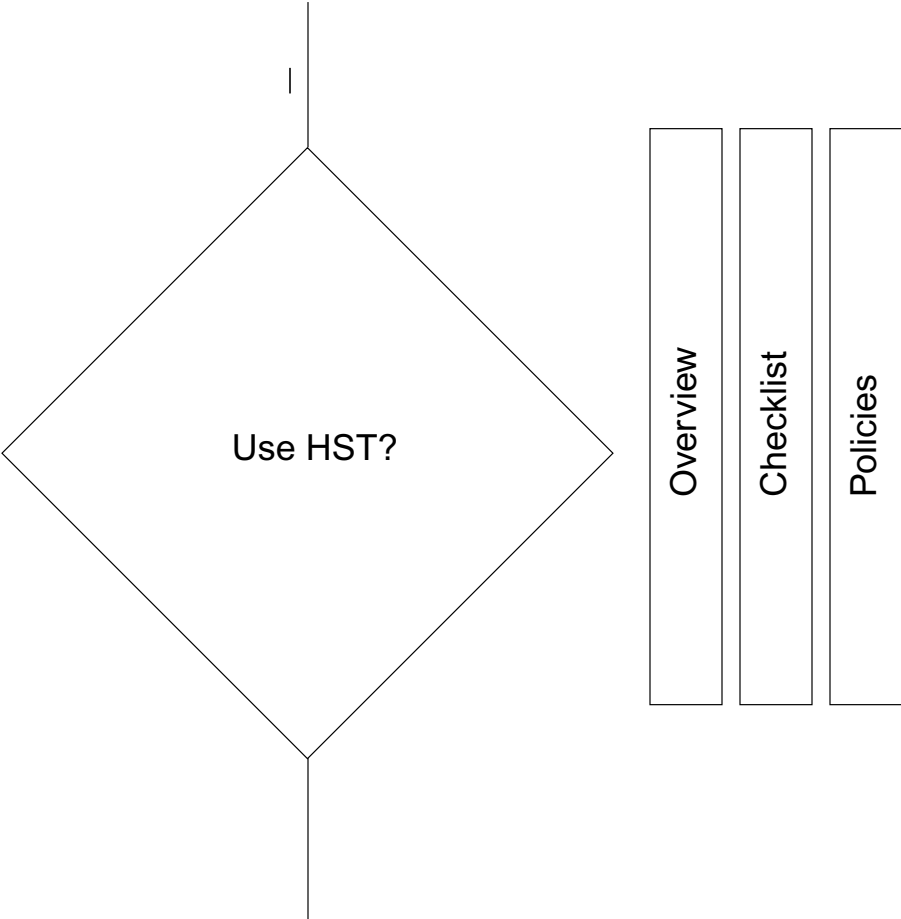
Figure 3: Expanded View of Create Proposal block

Program Components

APT Tools

Health&Safety	ROBOT				
Visits	SPREADSHEET				
Exposure Time	ETC		Examples, Strategies, Templates, Tutorials, Problems w/solutions, Syntax, Algorithms, SI Physical Characteristics, ... See Next Page (Figure 4)		
Patterns	VTT				
Target Acq	VTT				
Exposures	SPREADSHEET				
Targets	VTT				
	STIS	ACS	WFPC2	NICMOS	

Overview
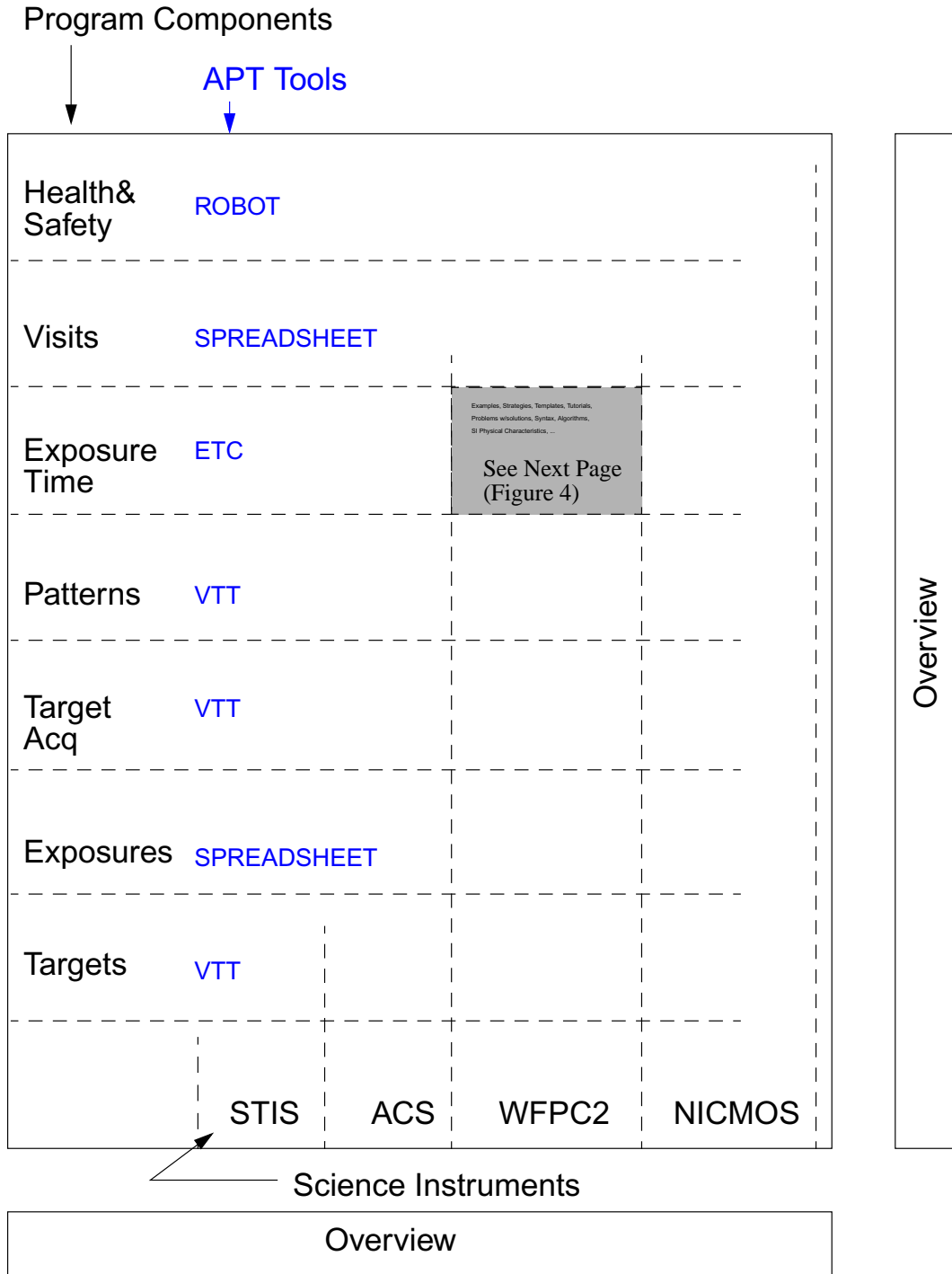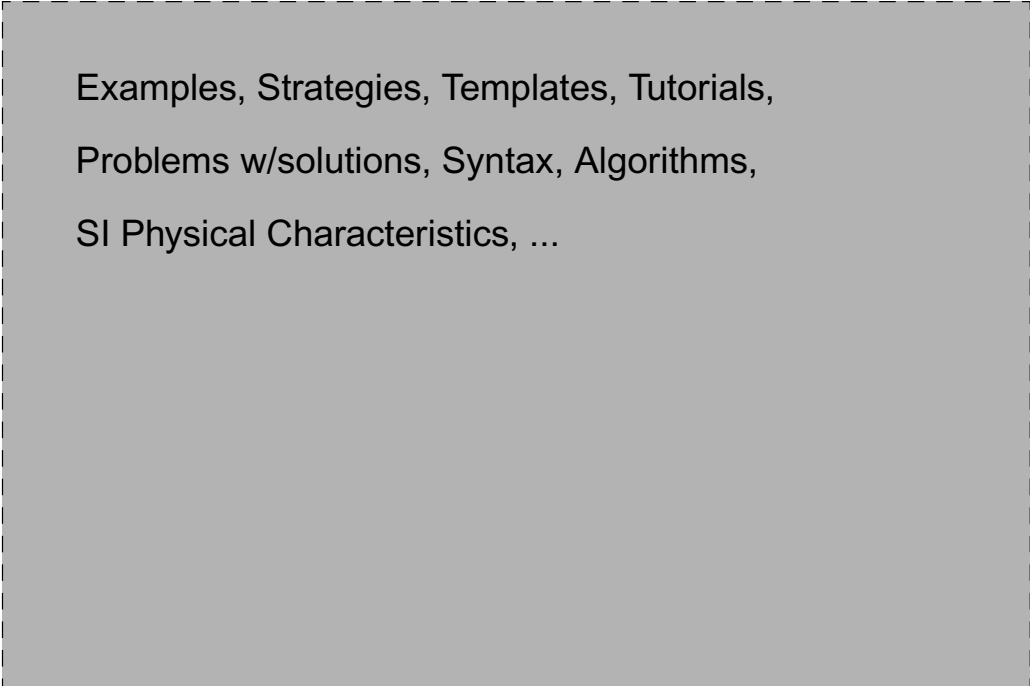
Science Instruments

Overview

Figure 4: The third dimension of the Create Proposals block

Examples, Strategies, Templates, Tutorials,

Problems w/solutions, Syntax, Algorithms,

SI Physical Characteristics, ...

Figure 5: Expanded View of Proposal Status block