Astronomical Data Analysis Software and Systems IV
ASP Conference Series, Vol. 77, 1995
R. A. Shaw, H. E. Payne, and J. J. E. Hayes, eds.

An Information System for Proposal Submission and Handling

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Abstract. The Proposal Handling and Reporting System (PHRS) is a software system aimed at supporting ESO's Observing Programme Committee (OPC) during the entire review process of the Observing Time Proposals. Proposals are written in a mark-up language based on LaTeX and are submitted via e-mail. PHRS maintains a database of validated proposals, and operators are enabled to browse it via user-friendly GUI tools, developed using Tcl/Tk. Referees receive PHRS generated printed reports, and submit proposal ratings via e-mail. Panel and OPC meetings are supported by interactive data entry tools and printed documents; in order to obtain high-quality output, all printed reports are processed via LaTeX. The final telescope schedule is published both on-line (World Wide Web) and in printed form.

PHRS was already successfully employed twice (for Periods 54 and 55), handling over 250 (peak) proposal submissions per day.

1. Introduction

Astronomers who wish to use ESO's facilities in La Silla (Chile) must submit Observing Time Proposals (henceforth simply *proposals*), indicating which facilities they want to use, when and for how long, and the science they want to perform. All submitted proposals are peer-reviewed and ranked by the Observing Program Committee (OPC) of ESO; the best proposals are finally assigned observing time at one of the telescopes in La Silla. This process takes several weeks, twice each year, and involves tens of people both within and outside ESO; more than one thousand investigators submit a total of over five hundred proposals each observing period.

The Proposal Handling and Reporting System (PHRS) at ESO is a software system aimed at tackling this problem and supporting the OPC. An entirely new version was developed in 1994, drawing on the experience gained during some years' experience with a previous, less comprehensive system. PHRS handles proposals throughout the entire review process: submission, storage, referee evaluation, panel discussion, OPC recommendation, and time assignment (scheduling).

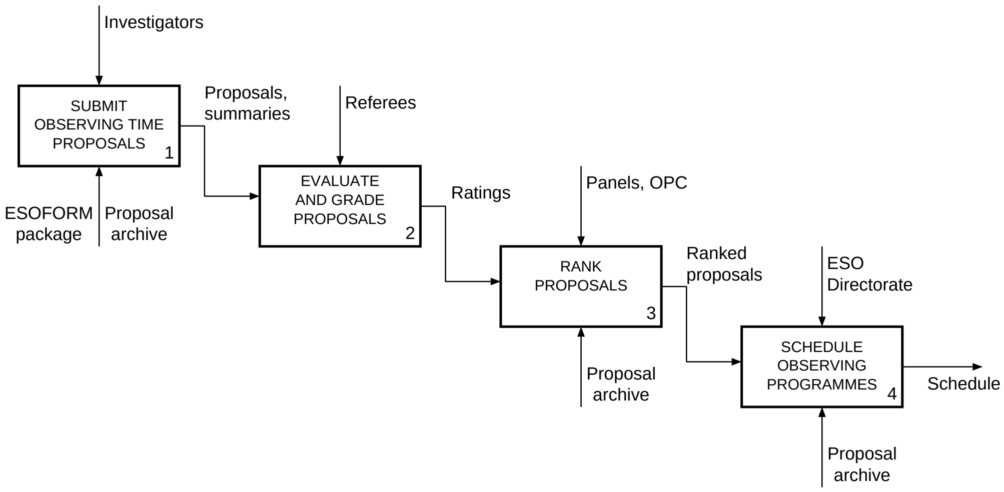

Figure 1. The proposal submission and review process.

2. Proposal Review Process

Figure 1 shows how the review process proceeds from proposal submission to publication of the final schedule, which is described below.

2.1. Proposal Submission and Archiving

Proposals need to be both computer-readable and nicely formatted on paper. We achieved both goals by developing a mark-up language based on LaTeX macros: the new commands give the proposal its appropriate look and are easily parsed to extract relevant information. The *ESOFORM* package, which can be downloaded to each investigator's site, contains all necessary style files, template Observing Time applications, user manuals and period-related technical information. When printed at ESO, a submitted proposal looks identical to the proposal on the investigator's desk—thus eliminating the need for paper copy submission. Investigators write their proposals, print them at their institute for verification, and then send them via e-mail to ESO.

Here, a "receiver" program verifies that all mandatory information was provided, then stores valid proposals in a database—the "proposal archive." No manual intervention is necessary: in fact, PHRS can operate unattended around the clock, and it proved able to cope with over 250 e-mail messages per day (usually on the last day before the deadline). Investigators normally get an acknowledgment message back within a minute or so of their submission; errors found in proposals are reported in detail. The authors went to great lengths to avoid data loss, even in the case of hardware failure.

The proposal archive is based on relational data base management technology, the same used in the STARCAT system (Pirenne et al. 1993). Operators interface with the archive with user-friendly, GUI-based tools, developed using Tcl/Tk (Ousterhout 1994). Since most of the data in the archive is classified, at least until schedule publication, we had to insure that only authorized operators could access it.

The system is network oriented, but it is flexible enough to allow for regular (post) mail submission of proposals as well. In some special cases, investigators submit printed proposals, and operators need to type the proposal's main data into the database.

2.2. Peer Review

Valid proposals are peer-reviewed. Each referee reviews several proposals of the same category (for instance, category C groups proposals dealing with "Interstellar and intergalactic mediums"): he/she is required to rate them, by giving a grade—expressing the proposal's scientific merit—and a recommended number of nights (and, often, explanatory remarks). The same proposal is refereed by two or three different people.

Referees receive a printed copy of the proposals they must review and a set of summary reports generated by PHRS; these are printed via LaTeX, with the goal of providing appropriate documents, where scientific symbols and non-English names are correctly printed. Referees are also provided with a pre-initialized, e-mailed form (called a "report card") which they must fill in with ratings and comments. In order to eliminate possible errors, completed report cards are then returned via e-mail, and later processed by PHRS to extract and store ratings in the proposal archive.

2.3. Discussion and Ranking

The final step in the review process is the ranking of proposals, and it is a two-phase activity. Initially, all referees of the same category meet in a panel; they discuss each proposal belonging to the category, and agree on a final grade and recommended number of nights. The goal of panel discussion is to rank all proposals in one category according to their scientific value: better proposals are more likely to be assigned observing time, and telescopes are often oversubscribed by a factor of four or more.

PHRS supports the panels with more summary reports and interactive tools: since panels can directly update the proposal archive, there is no need to re-type information, thus eliminating possible errors; and panels can explore alternative rankings with respect to the number of available observing nights. Some data summaries are generated in spreadsheet format, for further processing and chart generation.

When the panels have completed their task, it is the OPC's responsibility to harmonize rankings across different categories and telescopes. A "cutoff line" separates the best proposals from those that will receive telescope time only if there is any time left, and the OPC ensures that proposals of different categories are evenly distributed around the line. PHRS provides per-telescope and per-category cutoff line reports to support OPC discussion.

2.4. Scheduling

Once the OPC has finalized its decisions, it is the ESO's directorate responsibility to distribute observing proposals (which are now called "observing programmes") over the range of available nights. This is a very complex and delicate process, and it is currently performed by hand; we plan to integrate telescope scheduling within PHRS as our next project. The final schedule is both stored in the proposal archive and published. ESO distributes the schedule document to all interested investigators, and we also developed a World Wide Web interface to the schedule archive[1] for on-line browsing.

3. Conclusions and Future Directions

Some recent advances in technology have made PHRS possible: (1) widespread Internet access enables most investigators to use FTP and e-mail for their submission, (2) "client-server" software techniques increase the system's modularity, reliability and efficiency, (3) easy to develop, "point-and-click" Graphical User Interfaces (GUI's) minimize operator training and reduce errors, and (4) centralized information storage, coupled with appropriate software tools, enable support staff to meet deadlines, providing timely and accurate information to the OPC.

A number of problems have arisen with the use of this new system, the main one being the inability to check the correctness of some user supplied information: for instance, investigators writing a (first) name where a surname (family name) is needed, and vice-versa.

Future projects include support for Observation Preparation (Phase II proposals), and both long- and short-term scheduling (telescope scheduling and observation scheduling). Finally, in order to reduce bulky paper shipments, we are investigating the possibility of having referees download proposals and reports from an FTP account.

Acknowledgments. The authors are grateful to J. Breysacher, C. Euler, E. Hoppe and G. Meylan, whose feedback was invaluable, and who guided our understanding of the issues involved in the design of PHRS.

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Ousterhout, J. 1994, Tcl and the Tk Toolkit (Reading, Addison-Wesley)

[1] http://arch-http.hq.eso.org/cgi-bin/wdb/eso/sched_rep/form