

## Paper Collection and Evaluation Through the Internet

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**Abstract** - This paper describes the design for the system that was developed to collect documents from multiple remote users and then make them accessible for evaluation. Different design considerations are discussed and evaluated based on the convenience of use. The actual system was developed and used for paper management at IECON'01 conference.

### I. INTRODUCTION

For the last few years, there is a trend to use the infrastructure of the Internet to speed up the process of organizing the conferences. It started from simple solutions such as creating conference Web sites with organizational information including but not limited to call for papers and from using email to provide additional quicker communication [1]. At some point in mid 90s, email became a reliable way to send binary file attachments. That new feature opened possibility of sending papers electronically instead of by mail. However, capability of fast and reliable electronic communication was not enough to create paperless conference office. One more crucial element was missing – a uniform data format to send papers in high quality format that would be ready for publishing. Initially Internet nodes were made by Unix computers and each of those computers supported one common format – postscript. That format was the first choice for sending papers. However, the files were bulky and difficult to handle on IBM compatible computers that were lacking full postscript support. The situation started to change when Adobe announced a new format that had all features of Postscript but in addition had internal data compression and was supported by the company on every major operating system.

Initially Portable Document Format (PDF) was used only for producing the electronic version of conference proceedings. All papers were still handled using hardcopies that were sent for the review, and later to a printing company, that was creating proceedings in book and CD-ROM formats. That company would have scanned the printed material and convert it to PDF. Wide popularity of PDF and reading software was not enough to revolutionize the way the documents flew. However, when Adobe started offering new products that made it easy and inexpensive for an average computer user to create their own PDF files the situation changed dramatically [2]. At first, conference organizers were offering an option to accept initial paper submissions in

the PDF format instead of in a form of a hardcopy. The papers that were submitted electronically could be forwarded to the reviewers by email. Reviewers could evaluate papers and send their comments by email. That allows speeding up the process and saving some postage expenses. However, the hassle of managing manually high number of papers remained. In addition, the final, camera ready version in the form of a hardcopy was required. At some point conference organizers started to require a hardcopy for the printed conference proceedings and electronic version in PDF for the CD-ROM version of the proceedings. The electronic version was to be submitted either by e-mail or by FTP.

In the last three years, more conferences turned to complete on-line document management [3]. Services are available that allow to collect author information and papers through Internet. However, most of those services are not fully integrated as a document management system for the conference organizers. This paper describes a conference paper submission system called SUBMIT that is still evolving towards serving almost all needs of a conference organizers.

### II. SUBMIT SYSTEM REQUIREMENTS

The on-line conference paper collection and evaluation system should handle multiple events at the same time and for each of them provide following features:

- The author interface:
  - Collect contact author information
  - Collect easily accessible paper information
  - Collect of the draft version of papers
  - Collect the camera ready version of the paper
  - Collect additional files for each paper
  - Edit and update the author information
  - Edit and update the paper information
  - Replace a submitted paper with its newer version
  - Replace an additional file with a new file
  - View the anonymous comments made by the reviewers
- The reviewer interface:
  - Access to the paper to be reviewed
  - On-line review form
  - Review and possibly editing of the previously submitted on-line review form
- The session coordinator interface:
  - Listing of all submitted papers by session

- Issuing paper access password for the reviewers
- Listing of all submitted papers and the results of their review
- Listing of all camera ready papers and comparison with the version submitted for the review
- Setting the status of the paper: accepted, rejected, withdrawn
- Mass emailing authors of papers that meet or do not meet certain criteria
  - All papers
  - All accepted papers
  - All accepted papers with final version submitted
  - All accepted papers with final version missing
  - All rejected papers
  - Enabling and disabling each of the author or reviewer functionality for all papers
  - Overwriting the enabled/disabled settings for an individual paper.

Most of the features listed above are already implemented in the system that works and already served one conference. Some features were so far implemented as accessible only to the local administrator instead of being available directly to a session chair or conference chair.

### III. SUBMIT SYSTEM ARCHITECTURE

The paper collection and evaluation system consists of five main components:

- Front-end based on static Web pages
- CGI scripts to carry out actions requested by users
- Local scripts to carry out actions requested by admin
- Paper database that is separate for each conference
- Configuration files that control the behavior of CGI scripts and local scripts.

There are two “front” Web pages, one for authors, and the second one for the event organizers. The first page links to several Web pages that each of them contains a login dialog or group of dialogs that allow access to features available to the paper authors. The latter page links to several Web pages that each of them contains one or more login dialogs that allow access to features available to the session coordinators and/or reviewers.

After successful logging in a CGI script is run. Some actions require only entering additional pieces of information in the login dialog, and the action is executed immediately. Others require editing additional form that has to be submitted before the action is carried over. For example, when a session coordinator wants the statistics for his session he needs to specify the session name before logging in, and the session statistics is displayed by a CGI script on the next screen. When authors want to replace their papers, they need to login with their password and

the paper number, and then a form is displayed that allows editing the author and paper information. The new version of the paper is updated upon submitting the form. The complete diagram of all control paths for remote users that are possible in the system is shown in Fig. 1 and Fig. 2.

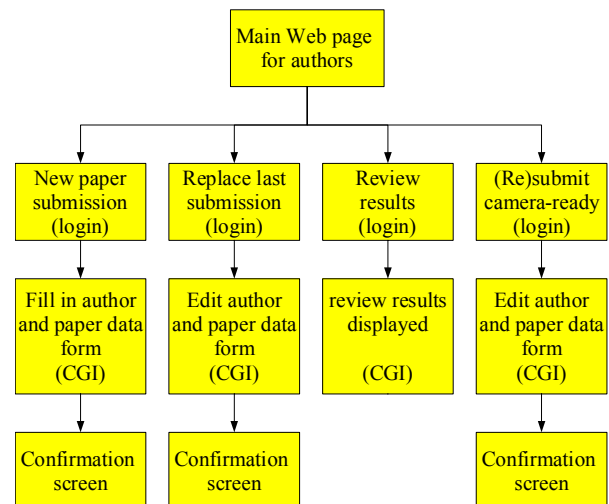


Fig. 1. The diagram of possible control paths for authors of papers in the SUBMIT system.

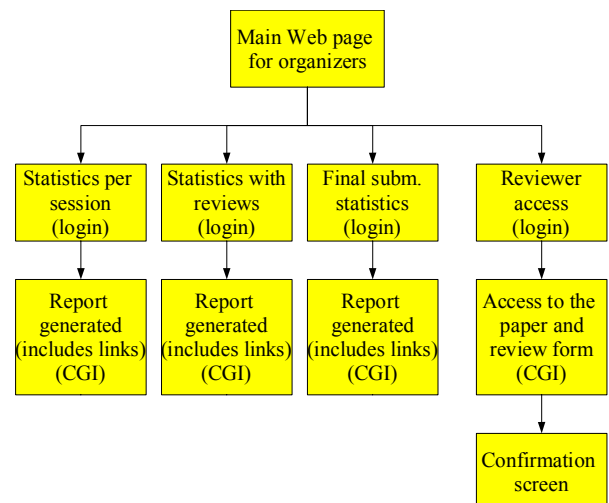


Fig. 2. The complete diagram of possible control paths for session coordinators and reviewers of papers in the SUBMIT system.

Since the nature of the system suggests that each user access the system only to perform one operation at a time, there is no mechanism to establish a session, i.e. remember his identity when moving among different data paths. Such a mechanism is a must in some other on line applications such as a Web-based retail store.

Some actions such as mass emailing, paper withdrawal, setting a paper as accepted or rejected have significant impact either on the paper database or on communication with authors. Therefore, those actions

were currently designed as accessible only by the local system administrator. However, a Web-based front end and login-based authorization can be easily added as necessary.

#### IV. SUBMIT SYSTEM IMPLEMENTATION

The system described in this paper has been developed using PERL as scripting language [4]. It was utilized to for paper collection and evaluation for the 27<sup>th</sup> Industrial Electronics Annual Conference in 2001. The submitted binary files are stored as individual files separately from the author and paper database. That makes the database files more efficient and allows easier recovery in the unlikely case of the database integrity loss.

To allow flexible configuration and handling of multiple conferences at the same time a three level set of configuration files is used. There are two first level configuration files. The first configuration file controls the essential parameters of the system such as bases for URLs and CGI scripts, system home folder location and the list of supported conferences that are called as supported events. For each supported event, the main second level configuration file location is specified. The second configuration files controls the color scheme of the system Web pages.

The remaining levels of configuration files are separate for each event. There is one second-level configuration file for each event. It defines several settings such as:

- the locations of database files and folders
- the prefixes and suffixes for the data files
- links referring back to the conference Web site
- information whether specific features are enabled for the particular conference at a time
- denial error messages in case the disable features are accessed
- short announcements that are to be displayed to users who access particular features of the system

The second-level configuration file also defines locations of the third-level configuration files. Those configuration files define the names of the sessions/technical tracks, who to notify about new submissions, the list of authorized session administrators and levels of their access, and the list of reviewers.

The following subsections illustrate sample control paths executed by the users of the SUBMIT system.

##### A. Submitting a New Paper for Consideration

In order to submit a new paper for consideration an author should:

- Choose the “Initial Paper Submission” login screen – upper portion of the window shown in Fig. 3.
- Click on “submit a new paper” button.

- Fill in the on-line submission form – shown in Fig. 4.
- Select the track or session type.
- Select a file on the local machine by clicking the “browse” button.
- Make sure that the e-mail data filed is correct.
- Submit the paper by clicking the “submit” button.
  - When in doubt wait several seconds and check your email for confirmation before clicking another time. If multiple submissions are created, notify the system administrator.
- Check the system reply and write down the paper number and the author’s password – shown in Fig. 5.
- Follow the link to the paper to verify its integrity.
- Check e-mail for the confirmation.

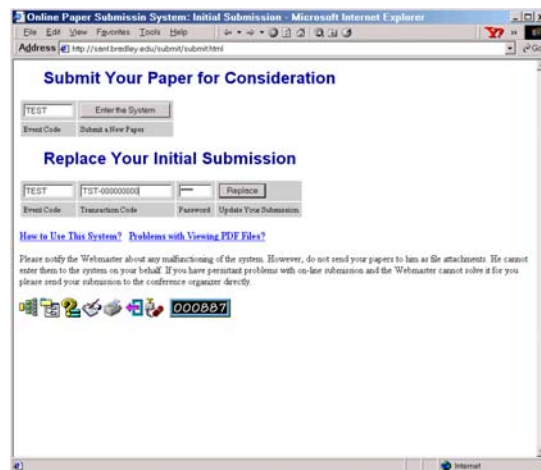


Fig. 3. Initial Paper Submission and Replacement combined login screen.

Fig. 4. Initial submission and resubmission data form.

##### B. Replacing a Paper Submitted for Consideration

In order to replace the paper already submitted for consideration before the review process starts an author should:

- Choose the “Initial Paper Resubmission” login screen – lower portion of the window shown in Fig. 3.

- Fill in the paper number and the author's password.
- Click the "replace" button.
- Edit the on-line submission form. The form will be filled in with data entered during the previous submission – shown in Fig. 4.
- Select the track or session type.
- Select a file on the local machine by clicking the "browse" button.
- Make sure that the e-mail data filed is correct.
- Submit the paper by clicking the "submit" button.
- Check the system reply and write down the paper number and the author's password – shown in Fig. 5.
- Follow the link to the paper to verify its integrity.
- Check e-mail for the confirmation.

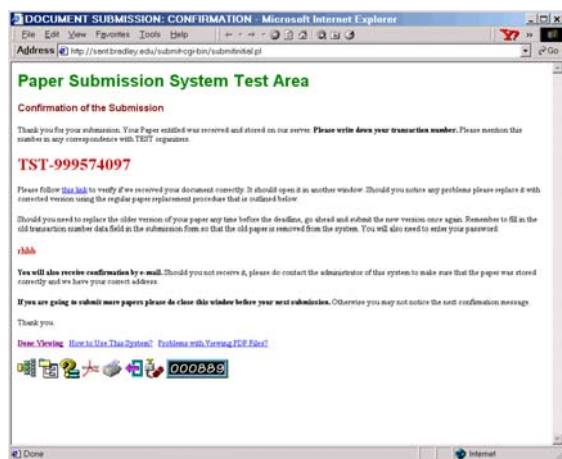


Fig. 5. Submission confirmation screen.

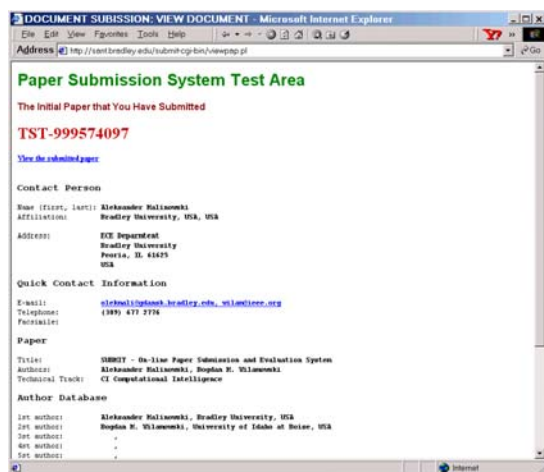


Fig. 6. Submission Verification screen.

### C. Verifying Initial Paper Submission

Sometimes an author or co-author wants to verify the correctness of data and the version of the paper already submitted. In that case:

- Choose the "Verify Initial Submission" login.
- Fill in the paper number and the author's password.
- Click the "View" button.

- Inspect the data displayed on the Web page – shown in Fig. 6.
- Follow the link to the paper to verify its integrity.

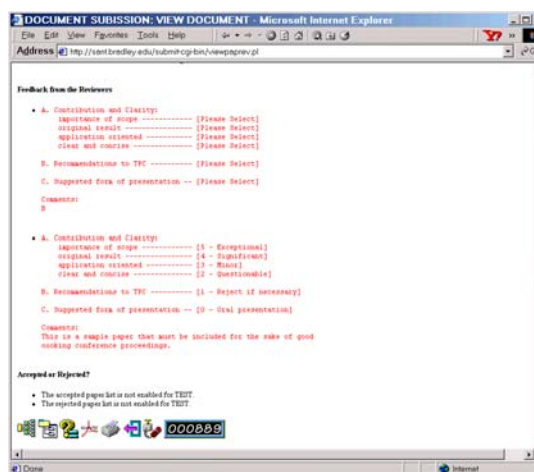


Fig. 7. Anonymized Results of the Review screen.

### D. Accessing Anonymized Results of the Review

When the review process is complete, authors will receive an email regarding whether their paper is accepted. They may want to see the anonymized comments from the reviewers. In that case:

- Choose the "Feedback from the Reviewers" login.
- Fill in the paper number and the author's password.
- Click the "View" button.
- Inspect the data displayed on the Web page – shown in Fig. 6 and Fig. 7.
- It is also possible to view the submitted paper.

System may be configured so that the system may allow checking the comments already made when the review is still in progress.

### E. Submitting or Updating the Camera Ready Paper

When the authors receive notification about acceptance of their papers they have to upload the camera ready version of the paper. Uploading the paper is by default enforced by the system. However, it can be configured so that the final submission is optional. When submitting the camera ready version of the paper the author follows the procedure similar to the initial paper replacement with one exception – the track or session cannot be changed. The login screen is entitled "Final Paper Submission". The system can be configured for more restrictive acceptance of binary file formats.

### F. Submitting an extra file with extended summary

In some cases conference organizers allow or request authors to submit additional binary files that may be included only in the CD-ROM version of the proceedings or used to prepare an abbreviated version of the



proceedings. At this time the system allows only one additional file per each accepted paper. When an author wants to submit that additional file:

- Choose the “Extra File Submission” login.
- Fill in the paper number and the author’s password.
- Select a file on the local machine by clicking the “browse” button.
- Click the “Submit” button.
- Check the system reply and write down the paper number and the author’s password.

### G. Verification of the Final Paper Submission

As in the case of initial paper submission, co-authors may want to verify the data stored in the submission form and the integrity of the final paper. They need to follow a procedure that is similar to the initial paper verification. They need to use the “Verify Your Final Submission” login. When the extra binary file is submitted, authors can verify that file in addition to inspecting their paper.

### H. Session Coordinator’s Initial Paper Summary

A technical track chair or a special session coordinator needs to monitor the paper submission process and at start the review process. The coordinator may inspect author and paper data on-line or request an Excel file with the current database state. In any case, the papers are available for viewing and download through the Internet from the password-protected dynamically generated Web page. That Web page contains paper access codes that should be forwarded to the reviewers. The system administrator should be provided with the reviewer e-mail address so that he could generate password for each reviewer. To access this information the coordinator should use “Initial Paper Submission” login.

### I. Session Coordinator’s Review Summary

When the review process is in progress the session coordinator may use another password-protected dynamic Web page. That Web page would contain the results of the review process for each paper. At this time there is no automation provided for the session coordinator because the final decision has to be made after including comments that cannot be quantified. To access this information the coordinator should use “Paper Review Summary” login. The sample screen is shown in Fig. 8.

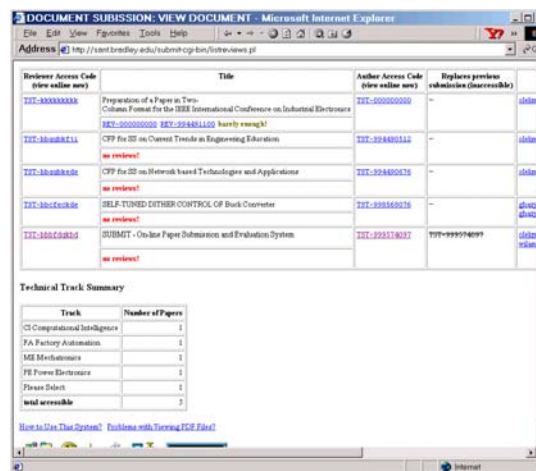


Fig. 8. Review Summary screen.

### J. Session Coordinator’s Final Summary

When the camera-ready papers are submitted the session coordinators need to inspect the final version of the papers. They can do it by using “Final Paper Submission List” login. That password protected Web page contains a list of submitted papers. The initial version of the paper can be compared against the final version.

### K. Reviewer Access

At the beginning of the review process, the technical track or session coordinators contact the potential reviewers. Then they provide each of the reviewers with access codes to each paper they want them to review. They also send an e-mail address of each reviewer to the SUBMIT system administrator. The administrator generates reviewer’s password and sends it directly to each person.

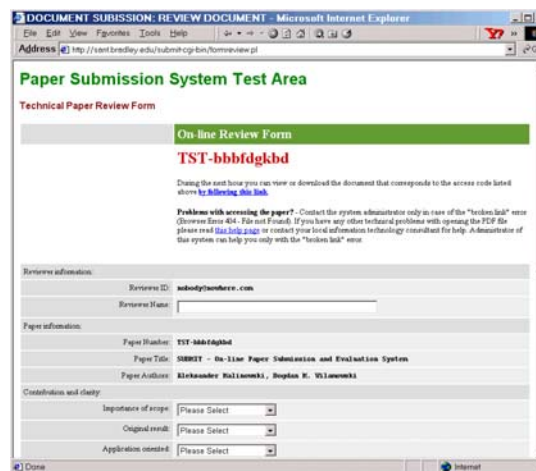


Fig. 9. On-line Review Form.

Upon receiving the paper review access number and the password, each reviewer can login to the system using “Reviewer Access” login screen. They will be provided

with the review form and an access to the paper. They can either perform the review at that time or only download or print the paper. In the latter case, they can login later to complete the process. Since the review form is short and simple, the system does not allow storing partial results of the review. Fig. 9 shown the review form and the link to the paper (underlined).

#### *L. Local Administrator Activities*

In the current version of the SUBMIT system the local administrator needs to provide several services for each conference served. Those services include:

- Initial setup of the system for each conference
- Generating user Ids and passwords for session coordinators. The generated passwords are emailed automatically.
- Generating passwords for the reviewers. The generated passwords are emailed automatically.
- Generating Excel files with the current database information. (This will be automated soon.)
- Removing duplicate submissions.
- Adding papers to the accepted/rejected/withdrawn paper list.
- Generating mass e-mail messages to the authors of all, accepted, rejected, accepted with the final paper submitted, accepted with the final paper still missing – papers. Various combinations are possible by applying interactive query to the paper database.
- Resending lost password and paper number, and correcting the incorrectly set author's email.
- Database backup.

#### *M. Conference Registration*

The conference registration is usually either contracted with another organization such as IEEE or performed even entirely off-line due to the copyright signature requirements. This makes integration of the registration into the SUBMIT system a very low priority task. At this time, the system does not handle any registration-related tasks other than manual mass e-mailing all registered authors. That task belongs to the local administrator tasks that were listed in the previous subsection.

## V. CONCLUSION

Although the system is still being developed and improved it already proved practical and useful during all stages of paper collection evaluation so far for one conference. The immediate improvements of the system needs to address automated Excel file export with the summary of information stored in author and paper database. At present, this extraction still has to be performed manually by the local administrator.

Remote on-line access to changing the configuration files or list of accepted/rejected papers may also be developed if necessary. At present, the configuration files must be edited manually. They still can be updated remotely using FTP protocol. However, even the basic administrative actions require good knowledge of the system. The present minimal load on the system does not justify time and effort to be spent on developing a user-friendly interface for those features.

The SUBMIT project development followed the “need to use” pattern. I.e. additional features were being added as the need arisen. That allowed for the minimum development time before the project could be at least partially utilized. However, it made it necessary for the users to go through one complete conference cycle before the system was in full operation.

You can test the SUBMIT system at any time by using a “fake” conference named TEST by visiting the Web site located at <http://sant.bradley.edu/submit/>.

## VI. ACKNOWLEDGEMENTS

The authors would like to thank the numerous authors of papers that were submitted for IECON'01 for their patience, troubleshooting reports and suggestions. They hope that the operation of the system will be smooth from the start in its service for the next conferences.

## VII. REFERENCES

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