

September 24, 2007

This report is based upon contributions from a number of Committee members, suggestions from BoG members, and guidance from an online survey of Society Members.

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## 1 Recent activities summary

Since ISIT 2007 in Nice, France, the Online Committee has done the following:

- Recruited new members to include students and better balance the Committee among “hackers” and “non-hackers”. Current Committee members are listed in Appendix A.
- Surveyed Society members on current websites and desired features. An assessment of the survey results is available in Appendix B.
- Evaluated content management systems (CMS) as the basis of Society websites in the future. See Section 3 for motivation and summary of the related issues.
- Prioritized and developed specifications for desired features. High-level descriptions of the features are available in Appendix D, and detailed descriptions of the features are available in Appendix E.
- Engaged potential developers to obtain cost and time estimates, and developed an implementation plan. See Section 4.
- Formulated this report, proposal, and plans for the Committee to continue facilitating website developments. See Section 5.

## 2 Recommendations

The Committee feels the time is right for the IT Society to move from a static HTML website to a dynamic website based upon a general purpose Content Management System (CMS). (See Appendix C for an explanation of a CMS.)

The Committee recommends that the BoG allocate \$50-75k and task the Committee to proceed with the two-phase plan outlined in Section 4, i.e., manage the migration of the main Society website to a CMS and oversee the development of a look and feel and custom features for the new site, putting an emphasis on usability.

## 3 CMS motivation and issues

The current Society website consists mainly of static HTML pages, but the site could be greatly enhanced if it were moved to a CMS. Among other things, migration from the current site to a CMS would allow:

- more frequent updates of the online resources, thanks to an interface allowing non-hacker volunteers to easily make site updates without affecting look-and-feel, and without requiring much time from the webmaster
- archiving of past reports, BoG minutes, etc.
- management of multimedia content, such as videos of plenary lectures, etc.
- integrated search capabilities, allowing many pages to be automatically updated as content is added, as well as allowing users to find content based upon their own search terms

- implementation of more advanced features, taking advantage of the latest advances in web technologies

We note that the Online Committee has for some time been evaluating the feasibility of some of these features with experimental Plone CMS (<http://dev.itsoc.org>) and static multimedia (<http://media.itsoc.org>) websites. Appendix C describes the CMS concept in more detail and articulates how one can enable more dynamic, up-to-date content while requiring less time from web volunteers.

There are several commercial and open-source CMS softwares available, and the main challenges appear to be finding the right infrastructure and forming a solid partnership with a developer that will support what the Society needs now and in the future. The next few paragraphs describe issues that would arise in moving to a CMS, more or less in the order they would need to be addressed.

### 3.1 Choice of CMS

The most prevalent open-source content management systems are Joomla (<http://joomla.org>), Drupal (<http://drupal.org>) and Plone (<http://plone.org>). From a user perspective these three solutions are basically equivalent as the content management interface can be made equally simple. However there are significant differences on the developer's side (scripting languages, database engines, modules available, and so forth), and the choice will impact the long-term future evolution of the website. Although it is not clear at this point which CMS will best suit the IT Society needs, as this will depend on the features to be implemented, it appears that either Drupal (<http://drupal.org/>) or Plone (<http://plone.org/>) are the best options for a general purpose CMS. This conclusion is based upon the Committee's collective experience, several readings, and reactions from volunteers in other organizations, e.g., the folks at ACM SIGGRAPH. In either case, any customization for the Society's specific needs, including usability, likely would require contracting with a developer partner.

### 3.2 Choice of Developer

Although a general purpose CMS provides a great deal of functionality out of the box, it is often the case that certain custom functionality needs to be developed and integrated for specific applications. For such circumstances, it is necessary to have the development performed by a professional or company. A side benefit to partnering with a developer is that they can help ensure that the Society employs best practices for hosting, managing, and updating the CMS after it is deployed.

### 3.3 Content migration

Because much of the Society's current content is static HTML, moving to a CMS will require translating it into the supported formats and content types, e.g., constrained HTML, XML, StructuredText, etc. This is not a bad idea per se, because the current content is probably in need of restructuring for archival purposes, and certain parts of the content (e.g., news items, events, dissertation abstracts) could take advantage of the content types and automation provided by the CMS.

### 3.4 Look and feel

Any CMS comes with a default look and feel, and it often takes a lot of work to customize it. This is best done by a professional team that knows the ins and outs of the system. In most cases, a user not logged into the website should not know or care whether their is a CMS generating it. A side benefit to developing a custom look and feel is that all the graphics would be archived and reusable for conferences, etc. (see proposed feature [D.1.3](#)).

### 3.5 New features

A good general purpose CMS allows for customization and streamlining operations for a group of people. The Committee has prioritized six features that will allow Society volunteers to do their jobs more effectively and Society members to gain more value from the Society websites. These features include:

- Repository management
- Meeting management
- Conference management
- Volunteering page
- Job opportunities page
- Dissertations, surveys, and tutorials

These features are summarized at a high-level in Appendix [D](#), and in more detail in Appendix [E](#).

### 3.6 Security

The CMS should support secure access rights to certain parts of the website. In particular, the following kinds of web spaces must be enabled:

- Private sections - access limited to a few selected people. Example: awards committee discussion pages (see [D.2.1](#)), treasurer page, etc.
- Public sections with restricted editing - accessible by everyone, but editing restricted to selected people. Example: BoG meeting minutes (see [D.1.1](#)), videos of plenary lectures, etc.
- Public sections with open editing - accessible by everyone, editing allowed for registered users. Example: volunteering page (see [D.1.4](#)), paper discussion area (see [D.2.4](#)).

The need for secure access to certain content will require usernames and passwords, and mechanisms for password recovery when forgotten. It would be beneficial to have as few usernames and passwords per user as possible, preferably one each; there may be a way to leverage the IEEE web accounts, but this would have to be explored. In any case, policies will have to be developed to determine who can access what content and how.

### 3.7 Content access based upon IT Society membership

Moving to a CMS means that the IT Society can provide a much richer variety of content than is possible with the current website. With the addition of tutorials and plenary talks, access to the resources provided by the Society becomes more valuable. It is not clear whether access to all or part of the features listed above should be restricted to IT Society members. Membership-related logging in should not be a hurdle that discourages contributions. However, by requiring Society membership to access certain resources, we may be able to provide a positive incentive for people to join the IT Society, which could help boost revenues. A related technical question is whether the membership database could be integrated with the CMS.

### 3.8 Licensing and content generation

One of the powerful features of moving to a CMS is that it makes it easy for volunteer users to contribute content. For example, IT Society members could contribute tutorials on various topics or other documents that could be shared, as well as comment on existing content.

However, since the IT Society would be hosting this content on a website, we must develop licensing and copyright rules for contributed content. Both Wikipedia and the Connexions project use licenses, and choosing a licensing scheme is an important decision. However, the particulars of this licensing can be decided at a later date.

## 4 Implementation plan

This section describes a draft plan for migrating the main Society website to a CMS and overseeing the development of a custom look and feel and several new features for the site.

Based upon three proposals from developers working with the IEEE Signal Processing Society, as well as initial feedback from potential developers, the Committee expects that migrating the entire IT Society website to a new CMS would take between 3-4 months. It is important that the developers have time to get a good sense of how the Society wishes to use the site in order to design an appropriate interface that will make the site easy to use both internally (for the BoG, committees, and volunteers) and externally (for the IT Society members and other users).

The short-term plan is broken into two “phases”. The steps for both phases are summarized below, along with some timeline and cost estimates based upon initial feedback from potential developers.

- Phase I
  - Cost: \$29.5-58k
  - Deliverables
    - \* CMS site (Install and setup: \$1.5-5k)
    - \* Custom look and feel (HTML/CSS/Skin: \$5-10k)
    - \* Content migration (\$5-25k)
    - \* User management (\$2.5k)
    - \* Repository management feature (\$1.5k)
    - \* Meeting management feature (\$10k)
    - \* Dissertations, tutorials, and surveys feature (\$2.5k)
    - \* Unit testing (\$1.5k)

- Timeline
  - \* **Week 0** – select CMS and developer
  - \* **Week 1** – finalize specifications on the different customized features to be implemented
  - \* **Weeks 2-3** – static design and other visual design
  - \* **Weeks 4-10** – custom content development
  - \* **Weeks 10-12** – configuration
  - \* **Weeks 13-14** – testing
  - \* **Week 15** – training
  - \* **Weeks 16-17** – existing content migration

- Phase II

- Cost: \$13.5k
- Deliverables
  - \* Conference management feature (\$8k)
  - \* Volunteering page feature (\$3k)
  - \* Job opportunities page feature (\$1k)
  - \* Unit testing (\$1.5k)

In Phase I, the Committee will team with a developer to implement a CMS, migrate the Society content from the current static HTML website, design a custom look and feel for the site, and implement 1-2 features from Appendix D.1. For example, the Committee could emphasize one administrative feature, such as Meeting Management, and one feature oriented at member value, such as Dissertation Abstracts. These features should be simple enough to implement in a short time frame at reasonable cost.

In Phase II, the Committee will continue overseeing the development of the remaining short-term features. The goal will be to have them all in at least testing phase in time to report on progress at the Spring BoG meeting. Breaking the plan into two phases will allow the Committee to reroute after Phase I if it is unhappy with the developer.

The Committee will report to the Officers, and any other interested BoG members, at each milestone to summarize status, test usability, and update the timeline and cost estimates.

## 5 Future activities

In addition to overseeing design and development of the new website, the Committee will work to encourage participation by Society volunteers and support the website once it is in place. The following will be some of the activities of the Committee going forward.

**Associate Online Editors.** The aforementioned features cannot be easily handled by a single Online Editor. Even the implementation of the simplest ones requires the definition of a new organizational structure to manage the resources. As a relevant example, the ACM SIGGRAPH group has 12 volunteers actively contributing to their website.

The Committee will work to distribute responsibility for maintaining content to relevant parties. For example, committees could be made responsible for their own committee updating and archiving needs. For instance, the BoG minutes should fall under the responsibility of the IT

Society Secretary. At the appropriate time, the Committee will also seek to nominate a group of Associate Online Editors who would help editing all the content and ensure that the IT Society fully exploits the potential of a CMS. Such distributed management would greatly increase the amount of resources available online and would ensure reasonably frequent updates.

**Contributed content.** In an effort to increase the existing content and engage more users with the new website, the Committee will actively encourage contributions of a variety of content, e.g., dissertation abstracts, tutorials, and survey articles, and will work to ensure that appropriate licenses and copyright are put in place. Although it is important to ensure a certain quality of the contributed content, it probably does not need to go through the same scrutinizing process as regular publications. Moreover, the IT Society does not need to endorse all content on the site, as long as it is clear which content is and is not endorsed. A CMS like Plone already provides a tagging functionality that distinguishes the types of content. One could also imagine having the soundness of the contributions briefly checked by the Online Editors before making the contributions available publicly. The ability to comment on existing content also provides a means for content to evolve in a distributed manner without requiring much input from editors.

**New features.** The Committee will continue to describe and prioritize features for the Society websites, and will take proposals from all Society members into consideration. The features listed in section D are a set of “core” features, that the Committee believes are the most likely to be useful and arouse interest. The short list of longer-term features presented in Section D.2 is the result of discussions among the Committee, but suggestions of new features or content from the general membership are definitely welcome. Ideally, the evolution of the CMS could incorporate any new ideas for content type, workflows, etc. submitted by members or Officers.

All of the above activities will be regularly highlighted in the IT Society Newsletter, beginning with the next issue.

## A Committee membership

Rich Baraniuk	João Barros
Matthieu Bloch (New, Student)	Jean-Francois Chamberland (New)
Marc Fossorier (New)	Ralf Koetter
Frank Kschischang	J. Nicholas Laneman (Chair)
Steve McLaughlin	Mehul Motani (New)
David Neuhoff (New)	Alon Orlitsky
Ashutosh Sabharwal	Anant Sahai
Anand Sarwate (New, Student)	Ulrich Speidel (New)
Daniela Tuninetti	Adriaan J. van Wijngaarden

## B Survey results

The Committee conducted a survey of ISIT 2007 attendees who voluntarily signed up for the [announcements@lists.itsoc.org](mailto:announcements@lists.itsoc.org) mailing list. The survey had 75 respondents. The most important features of the current site to users were access to Pareja and information about conferences. Users were most familiar with IEEE Xplore, arXiv and the main IT Society page but not the Media or Development sites. Correspondingly, the interest in new features centered around expanding digital content, especially out-of-print books and past plenary lectures. Respondents were less interested in web features to enhance collaboration and online discussion of research materials. While Pareja was deemed to be sufficient, several people thought Manuscript Central would increase transparency. Opinions towards EDAS were generally favorable, with some caveats regarding the format of reviews, interface, and its high price tag.

Full responses can be found at:

[http://cms.itsoc.org/bog/online-committee/web-features-survey/survey\\_view\\_results](http://cms.itsoc.org/bog/online-committee/web-features-survey/survey_view_results)

### B.1 Profile of Survey Respondents

Of the 75 respondents, 52 (69.33%) were full Members, 12 (16%) student members, and 11 (14.66%) non-members.

Membership status	Number	Percentage
Fellow	12	16%
Senior Member	10	13.33%
Member	34	45.33%
Student Member	13	17.33%
Non-Member	6	8%

### B.2 Opinions on IT Society site, Pareja and EDAS

Respondents who voiced opinions on the IT Society page found Pareja the conference calendar, and links to books and reviews as the most useful features. A smaller group also liked to get announcements and access to the BoG meeting materials. One user accesses the Transactions on IEEE Xplore via the Society page due to expensive journal bundling practices from the IEEE. Very few people found fault with existing features, except for two who cited the out-of-date thesis abstracts.

Opinion on Pareja was divided. For each person who lauded Pareja's "simple" and "streamlined" interface there was another respondent who decried it as "clunky" or "ugly." Positive aspects of Manuscript Central that were cited were:

- a single login per *author* rather than one login per *paper* (so that authors can track multiple submissions and maintain a history)
- transparency in the submission process with automatic notifications and verification
- lower burden on editors and thus faster review times
- a common platform across several IEEE publications

Defenders of Pareja had negative experiences with Manuscript Central or found the differences to be too minor to be worth making the switch. A distinction was drawn between using Manuscript Central as an AE versus as an author, but there was no consensus on which system was better from the editorial perspective.

Respondents mostly liked EDAS and thought it "works well," and was convenient but there were some reservations about whether it was worth the money. One respondent suggested using an open-source system for conferences. Some respondents did not like the multiple-choice review style used by EDAS, and some found the user interface poor. One count in its favor is that it has become the "de-facto standard."

### B.3 Popularity of new features

Of the new features suggested in the survey, the most popular was the digital archiving of research materials. An overwhelming number of respondents wanted digital versions of out-of-print information theory texts (78.66%) and past Shannon and plenary lectures from ISIT and ITW (69.33%). The next most popular options, garnering more than 56% interest, were digital conference archives for non IT-society conferences such as Allerton and CISS, non-IEEE journals such as PPI and Information and Control.

Two more options that received greater than 50% support were collecting survey/tutorial materials and a more full-featured conferences page. Interestingly, all options involving using the IT Society web page to facilitate discussion, create content, archive committee work, or flavors of "social networking" garnered less than 33% interest.

Only three alternate suggestions were made: to create a preprint server with "time-stamps" like arXiv to expand resources for teaching and presenting information theory, and to add information about conferences in related fields such as Machine Learning. The latter two suggestions reflect a desire to create bridges between the IT Society and others (students or other researchers) that was not reflected in the set options presented to survey participants.

### B.4 Usage of existing web resources

Of these 75 respondents, 66 (88%) were generous enough to answer 6 more questions on their usage of existing features of the IT Society website. The results, summarized in the table below, show that the IT Society resources beyond the main page are mostly unused<sup>1</sup>.

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<sup>1</sup>The Student Society site may be an exception, as there were only a small number of student member respondents

Resource	unaware	do not visit	< 1 x/month	1-3	4-10	11+
IEEE Xplore	1	2	4	7	16	34
arXiv	4	7	10	15	10	18
<a href="http://itsoc.org">itsoc.org</a>	0	7	28	22	4	3
ITSoc Students	26	18	16	4	0	0
ITSoc Media	42	7	12	3	0	0
ITSoc Development	47	1	8	4	4	0

## C Content management systems explained

A *content management system (CMS)* is server software, often web based, that supports the evolutionary life cycle of digital information such as text, multimedia, and other files. (See [http://en.wikipedia.org/wiki/Content\\_management\\_system](http://en.wikipedia.org/wiki/Content_management_system) for a longer explanation.) Most web applications enable management for specific types of content and applications. For example, the websites Manuscript Central (<http://sps-ieee.manuscriptcentral.com/>), Wikipedia (<http://www.wikipedia.org/>), and Flickr (<http://www.flickr.com/>) provide content management functionality for papers, encyclopedic information, and digital photos, respectively. They do so by implementing a set of *roles* to characterize different users in their relation to the content and *workflows* to identify different content *states* and to specify how certain roles can cause certain transitions among states.

To make these concepts more concrete, consider the example of Manuscript Central. A simplified view has roles of “Author”, “Editor”, and “Reviewer”. The workflow specifies which roles can perform various actions when a paper is in states such as “Incoming”, “Assigned”, “Under Review”, “Accepted”, and “Rejected”. For example, when an Author uploads a paper, it starts in the Incoming state. The Chief Editor can assign an Editor to the paper, moving it to the Assigned state. While in the Under Review state, the Editor, Reviewers, and Authors potentially go through several rounds of review, with the system controlling who can access reviews and upload revisions under what circumstances. Finally, the Editor makes a decision to accept or reject the paper, and the system moves it to the appropriate state.

A *general purpose CMS* provides a common foundation for managing different kinds of content types generically, but can be customized and extended for specific applications. The main advantage of starting with a general purpose CMS is that a great deal of baseline functionality is available out of the box and does not have to be implemented from scratch. The main disadvantages of a general purpose CMS are that the raw user interface and learning curve can initially be intimidating, and the software complexity often requires partnering with a developer for streamlining and customization.

A CMS is deployed primarily for interactive use by a potentially large number of contributors. This feature could be important in the future if a significant number of Society members engage in the website. However, even if a small set of volunteers are the primary contributors and editors on the website, a CMS can make their time spent much more efficient. The main reason for both of the above benefits is that a CMS generally provides a simplified means for contributing content, e.g., News Items or Events. These are entered through structured forms and appear automatically on the site as part of the CMS. By comparison, the process now involves sending an unstructured email to a webmaster who edits low-level HTML and has to place the piece in each page on which it should appear.

If the Society now knew precisely what content it wants to manage and the appropriate roles and workflows for managing it, then building a custom application from scratch could make sense. However, a lot of time and energy would be spent “reinventing the wheel”. Building upon

a solid, general purpose CMS would provide the Society with substantial functionality out of the box, provide room for growth, and allow volunteer time and energy to be devoted exclusively to identifying custom content types, workflows, and user interfaces.

## D Feature descriptions: high-level

This section lists the desirable features that have emerged from the Committee meetings, the results of the online survey, and discussions with Officers. The implementability and desirability of each feature are indicated by symbols defined in Table 1.

Table 1: Meanings of symbols.

▲	easy implementation - close-to standard feature of CMS
▲▲	moderately easy implementation - requires some additional development
▲▲▲	difficult implementation - requires significant development
♥♥♥	highly desirable feature
♥♥	desirable feature
♥	aroused little interest

A detailed description of the features can also be found in Appendix E. In particular, *content types* and *workflows* are associated with some of the features. A workflow is simply a state diagram representing the different states of an object (report, call for paper) and the transitions from one status to another. In a CMS, workflows can be directly implemented and defines how an object can change, what operations that can be performed on it, and who can perform them.

### D.1 Short-term implementation

This section describes the features prioritized for implementation in the short-term.

#### D.1.1 Repository management (▲/♥♥)

**Purpose.** The purpose of this general feature is to provide an online repository whose content and access permissions are entirely controlled by a selected group of people, e.g., a particular committee. For instance, this generic feature would allow:

- a committee to share, discuss and archive documents;
- the Treasurer of the IT Society to archive his/her reports; note that the Treasurer repository can have a public part, accessible to all users, and a private part, accessible to the BoG only for instance.

A certain degree of collaborative work could also be performed within repositories. For instance, before publishing a committee report, committee members could post their comments and approve the report online. It could be possible to have a report approved by only one person, or by a group of people.

#### D.1.2 Meeting management (▲▲/♥♥♥)

**Purpose.** The purpose of this feature is to streamline the organization and execution of meetings among busy people who may use the CMS infrequently. The interface must be really simple,

otherwise attendees will resort to emailing their reports to webmasters for posting rather than using the CMS.

### D.1.3 Conference management (▲/♥♥)

**Purpose.** The purpose of this feature is to simplify the planning and website management of a conference. The proposal given here is somewhat bare-bones. With additional work (and some cost) it will be possible to integrate additional features. An average ISIT now typically spends thousands on their website, including licensing to EDAS. Even by creating a uniform template and method for passing information about conference organizing from one year to the next could save significant time and money. The money saved over the next few years may be sufficient to pay for the development costs.

### D.1.4 Volunteering page (▲▲/♥♥)

**Purpose.** The idea of this feature is to set up a page where members can go to volunteer for Society-related activities like reviewing, conference organizing, sessions chairing, BoG membership, BoG ad hoc committees, etc. This would not only be a useful service to people who are looking for volunteers, (e.g. associate editors, conference organizers looking for program committee members, sessions chairs, etc.) but also an opportunity for people to become involved in Society activities. For instance, this page would provide a form allowing people to enter their name and contact information, and to check boxes indicating the activities for which they would like to volunteer. There would also be a second interface providing an easy way for people who are looking for volunteers for some task to view the potential volunteers who have expressed interest.

### D.1.5 Job opportunities page (▲/♥♥)

**Purpose.** This feature would provide a centralized page for members to check opening positions (most likely academia-related) and for faculty to post announcements. There is already such a webpage on the Student IT Society website, but it is seldom updated. This feature can easily be implemented with a CMS and a simple user interface would encourage frequent updates.

### D.1.6 Dissertations, Surveys, and Tutorials (▲/♥♥)

**Purpose.** The purpose of this feature is to enable user-contributed dissertations, surveys, and tutorials, either as Links or Files. It can also form the basis of a Paper content type for the long-term features described in Section D.2.7.

Dissertations, surveys, tutorials, and retrospectives on new and not-so-new trends in Information Theory, Coding, etc., are important for the community. To the best of our knowledge, the Transactions on Information Theory seldom publishes such papers (except in some special issues). The web could be an appealing alternative. It is not clear whether this content should be officially endorsed by the IT Society, or if we should allow a more distributed way of contributing along the lines of something like Wikipedia. The second option would probably ensure more frequent updates and would be of greater interest for students.

## D.2 Long-term implementation

This section describes features for implementation after the first few phases of working with a developer.

### D.2.1 Awards committee page (▲/♥♥)

**Purpose.** This feature would consist in setting up an awards committee page with restricted access that awards committees can use when deciding the IT Paper, Joint IT/Com award, Wyner award, Shannon award, Chapter award, and various IEEE awards. This would not only allow archiving of papers and nomination reports to facilitate the task of subsequent committees, but also allow online discussions, online voting and provide report templates.

### D.2.2 Online Newsletter (▲/♥)

**Purpose.** The idea of this feature is either to complement or replace the current IT Society newsletters. For instance, this feature could easily be implemented like a weblog. Based on the results of the survey, it is not clear whether this should complement or replace the existing paper version. An online newsletter would offer more dynamic content, and one could consider increasing the frequency of publication.

### D.2.3 Enhanced conference websites (▲▲/♥♥)

**Purpose.** The idea would be to set up a webpage providing enhanced conference resources, such as electronic programs or direct access to conference proceedings. An advanced implementation of this feature can be found on the SPIE website (<http://spie.org/x6087.xml>), but one could also imagine providing the program in iCal format (readable by most Calendar Applications). Ideally, the implementation of this feature should be coordinated with the organizing committee (for conferences like ISIT), but this is not mandatory (see the ISIT2007 program on <http://www-demo.itsoc.org>). Ideally, conference attendants could also access the paper and presentation associated with a given talk online, through an organized events page of sessions and talks.

### D.2.4 Paper discussions area (▲▲▲/♥)

**Purpose.** This feature would allow registered members to upload some technical content (most likely papers, but this could be extended to presentations or even videos, see <http://scivee.tv/>) and to discuss it online. Ideally, the discussion plugin should have LaTeX support, perhaps allow the insertion of figures and have a simple cross-citation tool. A more elaborate version could enable the comments posted by an IEEE IT Society member to have a semi-permanent link associated with each comment post that can then have an automated BibTeX entry generated for it, so that people can easily cite online comments in their future papers. Ideally there should also be a way to automatically checkpoint entire discussions into a single LaTeX document that gets revised periodically.

This feature seems to have little popularity, but this might be due to the fact that only 13 students have answered the survey. The existing Student IT Society mailing list which was specifically created to foster discussions has not had much success, but online forums would probably be better suited for that purpose.

**Testing.** In order to test the user friendliness and to obtain feedback, the paper discussion feature could be tested at a smaller scale. For instance, its usage could be limited at first to certain committees, such as the Awards Committee (see D.2.1), or to a couple of contributed surveys and tutorials (see D.1.6)

### D.2.5 Member profile management (▲/♥)

**Purpose.** The idea would be to allow registered member to create a profile hosted by the IT Society. This profile could provide a short biography and a list of IT-related publications. This is probably not really useful for established researchers, but could be handy for students and post-docs whose affiliation often changes.

### D.2.6 Preprint server or arXiv interface (▲▲▲/♥♥)

**Purpose.** The idea of a centralized server for IT-related preprints has aroused quite some interest, however it is not clear whether the IT Society should push for the creation of an independent preprint repository providing functionalities similar to arXiv (timestamp, etc.), or design an interface to arXiv in the spirit of <http://arxiv.org/corr/home>. In both cases, there should be an automated way to have the links migrate from a preprint posting to a paper published on IEEE Xplore. This would encourage users to access papers through IEEE Xplore, and would be financially beneficial to the IT Society in the long term.

### D.2.7 Integrated submission process (▲▲▲/♥♥)

**Purpose.** The idea behind this feature would be an improved submission and reviewing system for the IT Society. The current submission system (Pareja) lacks a couple of convenient features such as

- a login per user rather than login per paper,
- a history of submitted papers / reviewed papers,
- up to date status of submitted paper (the American Physical Society provides authors with all the information about their paper, date when the reviewers were assigned, dates when reminders were sent, etc.).

If nothing else, this feature would probably reduce the numbers of angry emails received by Associate Editors. The submission system could even be designed to replace a conference paper management system such as EDAS in the long term, and could include the posting of preprints in the reviewing process.

## D.3 Archiving Features

This section highlights some archival features that will eventually be implemented once copyright and other non-technical issues are addressed.

### D.3.1 Digital archiving of out-of-print resources (▲/♥♥♥)

**Purpose.** The idea would be to set up an online repository of out-of-print and rare IT-related resources, such as Fano's "Transmission of information; a statistical theory of communications", Csiszár and Körner's "Coding Theorems for Discrete Memoryless Channels", etc. This feature has aroused a lot of interest and poses no technical difficulty, however the major difficulty is probably to deal with copyright management.

### D.3.2 Digital archiving of non-IEEE journals and conferences (▲▲/♥♥)

**Purpose.** This feature would provide access to non-IEEE proceedings/journals. In the case of proceedings not available online, one possibility would be to host the papers directly on the IT Society site. In the case of journals, the website could just be an interface to these resources. Once again, the main issue would be the copyright management.

### D.3.3 Digital archiving of plenary lectures (▲▲/♥♥♥)

**Purpose.** The idea would be to archive the videos/slides of plenary lectures. This feature is already provided to some extent by the IT Society via the website <http://media.itsoc.org>. However, the user interface can be seriously improved. Several tools allow to combine videos with slides in a coherent and user-friendly way. Examples of such multimedia content can be found on <http://www.inria.fr/multimedia/exposes>, <http://www.scivee.tv/> or <http://www.wlap.org/>. Note that this need not be restricted to conference lectures, some of the talks given on other occasion might be of interest to the community.

A related question is whether the IT Society should consider investing in video recording devices, video editing software, and student training to ensure a consistent coverage of the main events (ITW, ISIT, etc.)

## E Feature descriptions: detailed

### E.1 Repository management

**Purpose.** The purpose of this general feature is to provide an online repository whose content and access permissions are entirely controlled by a selected group of people. This generic feature would allow for instance:

- a committee to share, discuss and archive documents;
- the Treasurer of the IT Society to archive his reports; note that the Treasurer repository can have a public part, accessible to all users, and a private part, accessible to the BoG only for instance.

A certain degree of collaborative work could also be performed within repositories. For instance, before publishing a committee report, committee members could post their comments and approve the report online.

**Content type.** Repository management is often a built-in feature of any CMS, and is already implemented on the current <http://dev.itsoc.org> website.

### E.2 Meeting management

**Content type.** Meeting (Folder) and Report (File) content types. The Meeting content type should contain the following:

1. Event: Date, Location, Logistics
2. People List: List of people to notify about the meeting, preferably just a pointer to an existing People List / Mailing List, e.g., BoG

3. Agenda (Page / Table that contains Agenda Items, Persons Responsible, and Links to Reports)
4. Folder of report / presentation Files

The user interface for creation of a Meeting should step through filling in the data, instead of all on one page. A Management screen should be available for sending email announcements / reminders, requesting reports, etc. For viewing the contents of a Meeting, it would be fine to view the Agenda; however, it would also be useful for the Agenda to have a link that generates a single PDF by concatenating the Agenda and all Reports.

The Report content type is analogous to the File content type in Plone, with Edit and View interfaces. Certain reports may be sensitive, so it should be very easy to indicate that the report should be private to the People List of folks attending the meeting.

### Roles.

- Leader: Creates the Meeting object, organizes Agenda, and invites Reports.
- Reporters: Submit and revised reports.
- Reviewers: Review reports before the meeting.
- Participants: Access the reports while at the meeting, insert comments, etc.

### Workflow.

1. **Plan.** The Leader creates a Meeting instance, fills in Event logistics, and drafts an Agenda. The edit page for the Agenda should make it really easy to add and sort Agenda Items, identify people responsible (using a search of site Members, for example), and indicate whether or not a report should be expected. There should be buttons like "Announce Meeting" and "Request Reports" which send emails to the appropriate people.
2. **Report.** When the Leader clicks on "Request Reports", a script iterates across the Agenda Items, creates the corresponding Report if not already present, and then emails the edit link for the Report to the person indicated in the Agenda item. This should enable a Reporter simply to click the link in their email, upload the file (predominantly PDF), and click Save. Ideally, the Report edit page could be simple enough so as not to confuse the Reporter with too many details, e.g., permissions, relationships, etc.
3. **Review.** Once reports have been uploaded, the Leader and Reviewers may wish to go through a round of review / edit on the reports, potentially requesting updated reports, and then finally moving to approval of reports. Once all the Reports are approved, the Leader may wish to announce that reports are available for discussion, remind about the meeting, etc.
4. **Publish / Archive.** After the meeting, the Meeting and all Report objects are published and made accessible to searches throughout the rest of the site, e.g., a page of Treasurer reports.

### E.3 Conference management

**Content type.** Conference content type. The Conference content type should hold all of the information for a conference, from the organizational aspects to the public website. There are several workflows that operate on the objects within the conference. A Conference is a container for two subfolders:

1. the *Organization* subfolder used by the conference committee to write proposals, budgets, submit reports, and other “behind the scenes” work;
2. the *Website* subfolder which holds the public website for the conference once it has been approved.

**Organization.** The organization section for the conference will contain the proposals, budgets, and other planning information for the conference. Some of these components will have workflows associated with them. The states in these workflows should flag news events in other areas of the site.

1. Events : reports for different parts of the planning process
2. Files : progress and closing reports, CFP, discussion area for paper awards
3. Special Files : Status file

The Status file is a form with some information automatically filled in from existing information:

- Year and Date (e.g. 2007, March 6-10)
- Conference/Workshop Name and Location
- Organizers, committee, and contact information for all of them, e.g., a PeopleList
- Links to all reports and budgets

It will also contain financial and organizational information that can be checked by the BoG, such as.

- Conference status: proposed (with date), budget approved (with date), conference approved (with date), conference held, conference closed (with date)
- Type of IT Sponsorship: sole sponsor, co-sponsor, technical co-sponsor
- Other sponsoring organizations (and their form of sponsorship):
- TAD Processing Charge (date paid, amount).
- Proceedings to go in IEEE Explore? (yes/no)
- Misc. comments

The conference listing page should provide convenient features to search or sort for conferences based upon the above categories.

**Website.** The website will contain public information about the conference<sup>2</sup>. The benefits of integrating the website for the conference with the planning objects are threefold : we provide a permanent home for ISIT and ITW sites that is archival, eliminate the need for conference chairs to find hosting, and integrate the planning and publicity processes more closely. The IT Society could even provide a simple template website. The Look-and-Feel of the previous ISIT websites was not extremely sophisticated, and a simple yet nice-looking template would not be too hard to design.

1. Events : CFP, submission deadline, notification of acceptance, final paper upload, early registration deadline, year/date, name/location
2. Files : CFP, technical program, list of participants, plenary speakers, student program social program, companion program, tours and excursions, tutorial, travel support, accommodation, travel information, awards, tourist information, registration information, information for speakers, sponsors. The natural content type, e.g., File, Page, Event, and PeopleList, will be determined through the development process.
3. Images : logo, photos

#### **Roles.**

- Conference Chair
- other chairs – TPC, publicity, local arrangements, etc.

In addition, there should be a list of local titles/roles for the conference, such as "Conference Chair", "TPC Chair," and so on. These are just re-namings of existing "Owner" and other classes. The conference class should instantiate mailing lists for the Technical Program Committee (TPC), Conference Committee, Local Arrangements Committee, and other groups.

#### **Workflows.**

**Overall Conference Proposal.** – the conference as a whole has a workflow wrapped around it – any authorized user can create a conference object, but it will be invisible until the proposal is approved by the BoG. Once the final report is submitted the BoG can close the conference and it will be archived. The workflow (see Figure 1) is identical to that used for job listings and other workflows, but with different state names.

1. **Draft.** The conference proposal is being *edited* by the committee. The Chair can *submit* the proposal to the BoG.
2. **Proposal.** The proposal is being reviewed by the BoG, who can *request revisions* or *reject it* to send it back to the Draft state or *approve* it to go to the Planning state.
3. **Planning.** The conference is being planned and *edited* by the committee.
4. **Closed.** The conference is over and the final report has been sent and approved.

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<sup>2</sup>See <http://www.isit2007.org/> for an example.

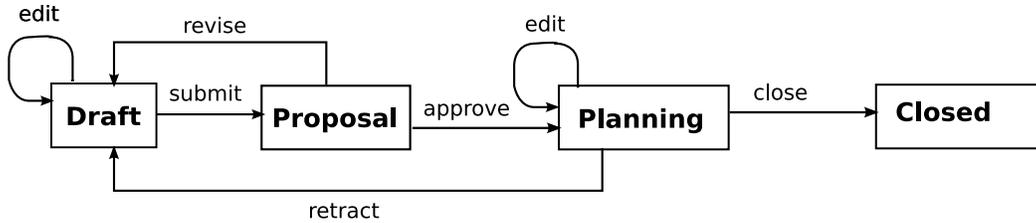


Figure 1: Workflow for overall conference proposal.

Table 2: Ownership and access of conference proposal

	Finance Chair	BoG	Access
draft	edit, submit		private to Conference Chairs
proposal		approve, revise	private to Conference Chairs and BoG
published		close	private to BoG and Conference Committee, website visible
closed			private to BoG, website visible and archived

**Reports** – the conference report workflow is quite simple and works for many different report types. In Figure 2 and Table 3 are the workflow and access table for budget reports. Similar tables can be made for the final report and other intermediate reports.

1. **Draft.** The conference proposal is being *edited* by the Finance Chair. They can *submit* the proposal to the Conference Chairs.
2. **Review.** The proposal is being reviewed by the Conference Chair, Treasurer, and BoG who can *request revisions* or *approve* it to be Published.
3. **Published.** The budget proposal is final.

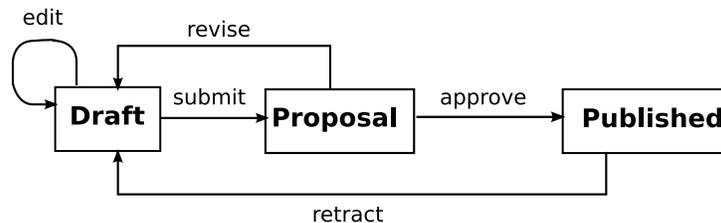


Figure 2: Workflow for conference reports

**Conference Information.** – The static content should be editable by the Website Chair and Conference Chairs, but some can be delegated. For example, the local arrangement chair should be able to edit and submit drafts for the local arrangements. The workflow is identical to job postings.

**Conference announcements.** This feature would provide a centralized page to post conference announcements, call for papers, and important dates. This is probably somewhat redundant with some of the existing mailing-lists, but given the huge volume of emails posted on those lists this

Table 3: Ownership and access of conference reports

	Finance Chair	Conference Chair(s)	Access
draft	edit, submit		private to Finance and Conference Chairs
proposal		approve, revise	private to Conference Chairs and BoG
published			private to BoG, Finance, and Conference Chairs

Table 4: Ownership and access of conference information

	Local Chair	Conference Chair(s)	Website Chair	Access
draft	edit, submit			private to LA, Website, and Conference Chairs
proposal		approve, revise	revise	private to Conference Chairs and BoG
published	retract	retract	retract	public, visible

page would provide a better organized way of accessing such information. One could also provide more detailed information about the status of the conferences sponsored or co-sponsored by the IT Society.

Conference announcements can be in 4 different states:

- **Draft.** A user is *editing* an announcement. Once the information is complete, the announcement is *submitted* for approval by an Associate Online Editor. In this case the state of the announcement switches to Proposal.
- **Proposal** The conference announcement is being reviewed by the Associate Online Editor, who either decides to *approve* it, *reject* it, or *request revisions*. In the first case, the state changes to Published, in the latter cases it goes back to Draft.
- **Published.** The conference announcement is visible to any user. If necessary, the announcement can be *retracted* for modifications and returns to Draft state. At the end of the conference, the announcement is automatically removed (or archived), and its state becomes Expired.
- **Expired.** The announcement is no longer relevant, e.g., does not show up in a search page, but can be kept for archival purposes.

Figure 3 illustrates the workflow of conference announcements or call for papers, and Table 5 shows who can initiate transitions and the accessibility for each state.

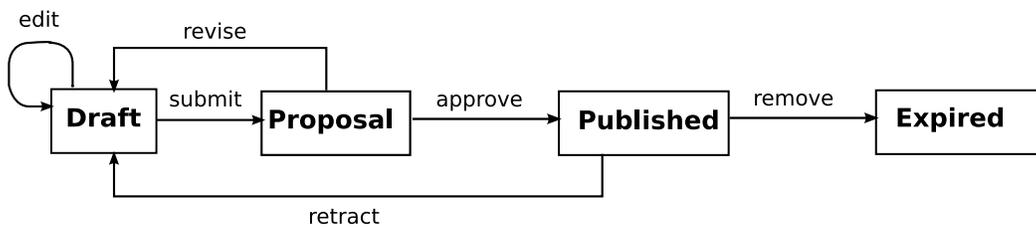


Figure 3: Workflow for conference announcements

Table 5: Ownership and access of conference announcements

	Regular user	AOE	Scanning device	Access
draft	edit, submit	-	-	private to user and Editor
proposal	-	approve, revise	-	private to user and Editor
published	retract	retract	remove	public, visible
expired	-	-	-	public, invisible

#### E.4 Volunteering page

**Purpose.** The idea of this feature is to set up a page where members can go to volunteer for Society-related activities like reviewing, conference organizing, sessions chairing, BoG membership, BoG ad hoc committees, etc. This would not only be a useful service to people who are looking for volunteers, (e.g. associate editors, conference organizers looking for program committee members, sessions chairs, etc.) but also an opportunity for people to become involved in Society activities. For instance, this page would provide a form allowing people to enter their name and contact information, and to check boxes indicating the activities for which they would like to volunteer. There would also be a second interface providing an easy way for people who are looking for volunteers for some task to view the potential volunteers who have expressed interest.

**Content type.** From an implementation standpoint, many of the features required for the volunteers page are similar to those of the job opportunities page described next.

#### E.5 Job opportunities page

**Purpose.** This feature would provide a centralized page for students to check opening positions (most likely academia-related) and for faculty to post announcements. There is already such a webpage on the Student IT Society website, but it is seldom updated. This feature can easily be implemented with a CMS and a simple user interface would encourage frequent updates.

**Content type.** Job announcement content type (file).

**Roles.**

- Announcer: creates a job announcement;
- Associate Online Editor: approves or rejects the announcement;

**Workflow.** Job posts can be in 4 different states:

- **Draft.** An announcer (regular user) is *editing* the job announcement. Once the information is complete, the announcement is *submitted* for approval by an Associate Online Editor. In this case the state of the announcement switches to Proposal.
- **Proposal** The job announcement is being reviewed by the Associate Online Editor, who either decides to *approve* it, *reject* it, or *request revisions*. In the first case, the state changes to Posted, in the latter cases it goes back to Draft.

- **Posted.** The job offer is officially posted on the website and becomes visible to any user. If necessary, the announcement can be *retracted* for modifications and returns to Draft state. If the announcement expires, it is automatically *removed*, but if the position is fulfilled, the user who posted it can manually remove it. In both cases, the state is switched from Published to Expired.
- **Expired.** The announcement is not relevant any more, but can be kept for archival purposes.

Figure 4 illustrates the workflow of job posts.

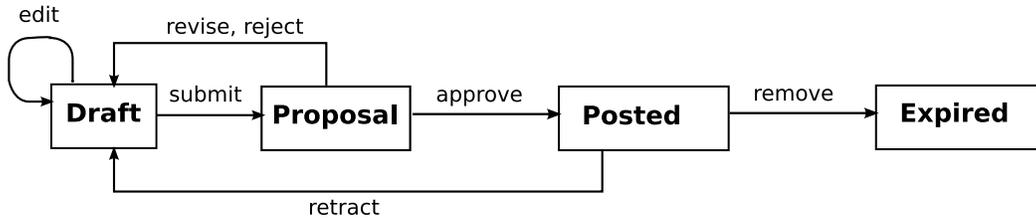


Figure 4: Workflow for job posts.

Table 6 shows who can initiate transitions and the accessibility for each state.

Table 6: Ownership and access of conference announcements

	Announcer	AOE	Scanning device	Access
draft	edit, submit	-	-	private to user and Editor
proposal	-	approve, revise	-	private to user and Editor
published	retract,remove	retract	remove	public,visible
expired	-	-	-	public, invisible

## E.6 Dissertations, Surveys, and Tutorials

**Purpose.** The purpose of this feature is to enable user-contributed dissertations, surveys, and tutorials, either as Links or Files. It can also form the basis of a Paper content type for the long-term features described in Section D.2.7.

Dissertations, surveys, tutorials, and retrospectives on new and not-so-new trends in Information Theory, Coding, etc., are important for the community. To the best of our knowledge, the Transactions on Information Theory seldom publishes such papers (except in some special issues). The web could be an appealing alternative. It is not clear whether this content should be officially endorsed by the IT Society, or if we should allow a more distributed way of contributing along the lines of something like Wikipedia. The second option would probably ensure more frequent updates and would be of greater interest for students.

**Content type.** Citation and Paper content types. More specifically:

- The Citation content type is similar to a Link content type but with extra bibliographic content (e.g., BibTex), including at least list of authors (preferably keyed into site-wide names database), abstract, keyword tags, and URL. The Edit page for the content type should allow searching and auto-filling from standard databases, e.g., ArXiv, IEEE Xplore, INSPEC, Google Scholar.

- The Paper content type would be similar the Citation content type, but with binary File data, e.g., PDF. The Edit page for this content type must have a Copyright Agreement section in which the contributor must check a box before uploading content.

An additional feature that could be of interest is "versions", e.g., multiple links in the Citation object to different versions of the paper, such as preprint and published article. The default URL would be most recent version, most likely the published paper on Xplore; however, those without Xplore access would still be able to easily recover the paper through the link history. Multiple PDFs in the Paper object would allow for similar features, though we would prefer to keep the size of a Paper object manageable.

### Roles.

- Author: Creates the Citation or Paper instance.
- Editor: Reviews and approves the content on the Society's behalf, perhaps with the assistance of additional Reviewers.

### Workflow.

1. **Draft.** The Citation or Paper is being *edited*, perhaps as a group of Authors in a fashion similar to Wikipedia. In this state the content has not been approved in any way by the Society, but the CMS infrastructure is being leveraged by authors to collaboratively edit and disseminate their work. If the Authors wish to obtain some kind of Society approval, they must *submit* the work.
2. **Submit.** The Editor reviews the content, perhaps with the help of other Reviewers. The Editor can either *approve* the content or *request revisions*.
3. **Published.** The Citation or Paper is officially posted on the website and available through automatic searches restricted to content in this state. In case the Authors or Editor decide to amend the content, it can be *retracted* and returned to the Draft state.

The workflow is summarized in Figure 5 below.

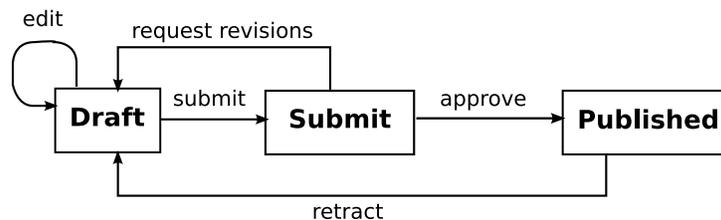


Figure 5: Workflow for citations or papers.

Table 7 shows who can initiate transitions and the accessibility for each state.

## E.7 Integrated submission process

**Purpose.** The idea behind this feature would be an improved submission and reviewing system for the IT Society. The current submission system (Pareja) lacks a couple of convenient features such as

Table 7: Ownership and access of citations and papers

	Authors	Editor	Access
draft	edit, submit	-	private to user and Editor
proposal	-	approve, request revisions	private to user and Editor
published	retract	retract	public,visible

- a login per user rather than login per paper,
- a history of submitted papers / reviewed papers,
- up to date status of submitted paper (the American Physical Society provides authors with all the information about their paper, date when the reviewers were assigned, dates when reminders were sent, etc.).

If nothing else, this feature would probably reduce the numbers of angry emails received by Associate Editors. The submission system could even be designed to replace conference management system such as EDAS in the long term, and could include the posting of preprints in the reviewing process.

**Workflow.** The workflow associated to a submitted paper is shown in Figure 6. The ownership and access is given in Table 8. Preprints can be readily integrated in the process, by allowing users to view the manuscript if the paper is in any state but published.

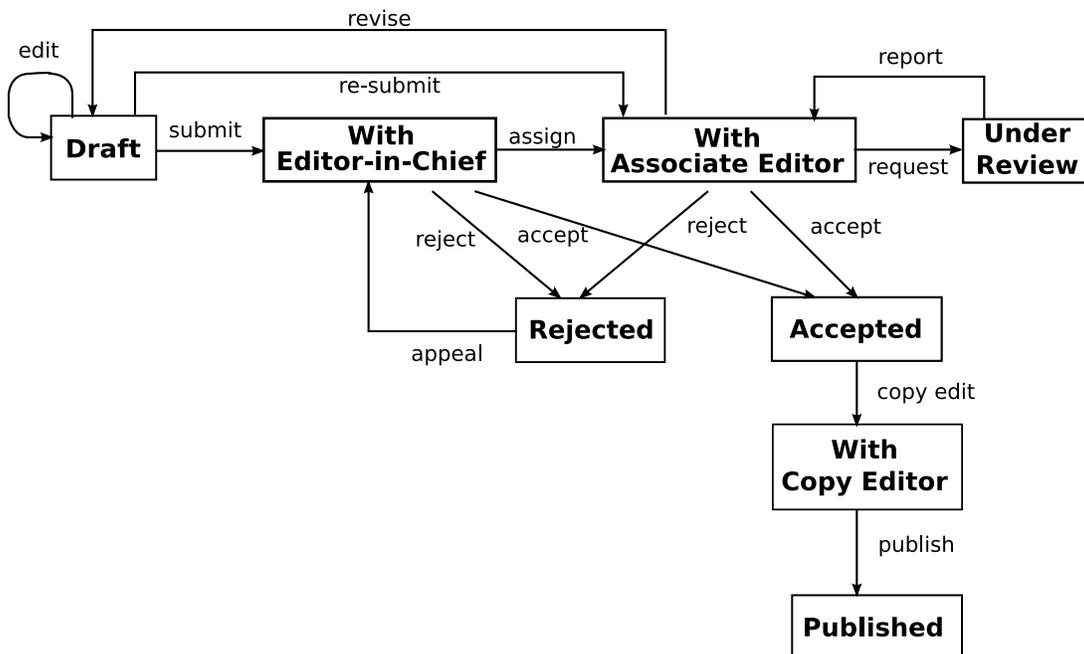


Figure 6: Workflow for paper submission.

Table 8: Ownership and access submitted papers.

	User	EiC	AE	Reviewer	CE	Access
Draft	edit, submit	-	-	-	-	user only
With EiC	-	assign, reject, accept	-	-	-	EiC only
With AE	-	retract	request, revise, accept, reject	-	-	EiC and AE only
Under Review	-	-	-	report	-	EiC, AE and reviewer only
Accepted	-	-	-	-	copy edit	EiC, CE only
Rejected	appeal	-	-	-	-	EiC only
With CE	-	-	-	-	published	CE only
Published	-	-	-	-	-	IEEE Xplore users only

## F System-wide content types

**PeopleList.** The purpose of this content type is to group a bunch of people, not necessarily members of the site, together for some specific purpose, and to apply "tags" to them. Examples could include a list of Officers, BoG Members, IEEE Fellows, conference organizers, etc. Tags could include role, year, etc. Each list item would consist of a name, email address, and potentially a comment. Edit scripts would make it easy to search for existing names and email lists in the system.

An important example is the Board of Governors (BoG) in a given year, award recipients across multiple years, and so on. We want to associate a group of people with a specific role or award for a given year and save this information. The utility of saving it would be that we could then have a nice search interface that would automatically generate many of the page views (currently static) at <http://www.itsoc.org/>, indicate who has served in what capacities recently, and so on.

Probably need to flesh out the data type with a skilled developer, based upon more input to describe our internal structure and archival information needed.