ACM *TODS* in this Internet Age

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It is a cliché that the Internet has revolutionized many aspects of life in the past decade. Scientific publishing is but one of the many enterprises that have been impacted by the connectivity and high bandwidth afforded by the World Wide Web. Most scientific journals now have a web presence. That said, it is still remarkable the degree to which ACM in general and *TODS* in particular have embraced the unique capabilities of the web to aid in the propagation of knowledge.

Here I summarize the disparate and broad ways in which *TODS* utilizes the web, in all phases of publishing.

Journal information The *TODS* web site (`http://www.acm.org/tods/`) provides on-line editorial guidelines, charter, and scope of the publication, as well as listing the editorial board, editorials, and links to these columns.

Manuscript submission Manuscripts are submitted by filling out an on-line form. The Editor-in-Chief is immediately notified of this submission by email, enabling an Associate Editor to be located and assigned quickly, generally within a week.

A manuscript tracking system affords authors the status of their submission, turnaround statistics for all submissions, and the current backlog of accepted, to-be-published papers.

Manuscript reviewing The tracking system provides access for reviewers to the paper assigned to them and allows them to enter their review on-line. It also maintains confidentiality in the review process via elaborate system controls. Referee rights and guidelines are provided on the *TODS* web site.

Editorial oversight The tracking system maintains information on each paper assigned to an Associate Editor, and notifies that editor by email whenever the paper changes status, such as when reviews have been received. This system provides an extensive set of reports to allow the Editor-in-Chief to assess the editorial process and quickly locate bottlenecks. This enables each submission to be efficiently and expeditiously handled.

Article dissemination Once a paper is accepted, the author can access style files on the *TODS* web site, as well as information on how to prepare the final version. The electronic version of the paper is available from the web (at `http://www.acm.org/tods/Upcoming.html`) as soon as it is provided by the author, generally several months before the paper appears in print.

Article citation page The citation page for each *TODS* article contains a wealth of information. Consider Timos Sellis' seminal paper (`http://doi.acm.org/10.1145/42201.42203`) on multiple-query optimization in the March 1988 issue.

- The journal, volume, issue, and author(s) are all links, to obtain lists of other papers of that journal, author, etc. in the ACM Portal.
- The *Digital Object Identifier* (DOI) for this paper is 10.1145/42201.42203. ACM is a member of PILA, the Publishers International Linking Association, known as CrossRef (`http://www.crossref.org/`), as are many other publishers and scientific societies. ACM deposits DOIs for each article ACM publishes together with a core set of metadata for the article, in the shared CrossRef metadata database. Other publishers with references to ACM works then send their reference metadata to CrossRef to look up the ACM-supplied DOI and thereby establish permanent links to the works referenced on ACM's site. ACM, in turn, takes the metadata of the references authors supply in article bibliographies, and queries the CrossRef metadata database to retrieve DOIs deposited by other publishers and thereby establish links to articles held on other participating publisher sites.
- A link provides the meta-data in BibTex format. Other links identify similar papers, allow the user to create or join a discussion forum on the paper, or add it to a "binder" (a collection of Portal entities that interest the user). (Access to binders and other Guide facilities are available to all ACM Professional, Student, and SIG

(including SIGMOD!) members as a basic membership benefit—see http://portal.acm.org/info/ for details.)

- The paper itself is available as a PDF file. Older papers, like this one, are scanned, and thus are longer (this 46-page paper is over 3MB in size). More recent papers are in native PDF. Wolfgang May and Bertram Ludäscher's December 2002 paper (doi.acm.org/10.1145/582410.582411) at 54 pages requires only 634KB, about one-fifth as big. Every *TODS* article, from the first issue of Volume 1 published in 1976, is available online.
- The full abstract is given on the citation page.
- This paper has 31 references, which are listed on the citation page. Some, in this case almost half, are links to citation pages in the ACM Portal (which include many papers not published by ACM). ACM has collected almost half a million of these links, and regularly expands the coverage. All references are linked through their DOIs. Older papers were scanned and OCRed and the references extracted from the PDFs before they could be looked up. For recent and future articles, the references are captured as part of the extended metadata itself, so extraction from PDFs is no longer a required step.
- Also listed on this paper's citation page are thirty papers that reference this paper, providing forward pointers into the literature. Thus works in the Portal have links that are traversable in both directions, allowing one to move backward in time to a paper's predecessors, or forward in time to a paper's successors.
- The index terms are provided by the ACM Computing Classification System, a hierarchical taxonomy (http://www.acm.org/class). Most *TODS* papers are classified in a subcategory of H.2 Database Management. Also included are general terms.
- Some papers include an electronic appendix or supplement; see for example the recent May and Ludäscher paper.
- Pointers to materials directly related to the paper are included in the paper's citation page. Examples can be found at the following links. After going to each, click on the "additional resources" link. (These are distinct from "Appendices and Supplements" in that "Additional Resources" point to resources available from external sites over which ACM has no control; ACM guarantees perpetual access to the former.)
  - http://doi.acm.org/10.1145/502030.502031 (a technical report)
  - http://doi.acm.org/10.1145/503099.503102 (a URL to a project)
  - http://doi.acm.org/10.1145/352958.352963 (an extended version of the paper as well as citations for two additional papers)
  - http://doi.acm.org/10.1145/383734.383737 (another URL with related technical reports and data)
  - http://doi.acm.org/10.1145/288086.288087 (additional documentation and code)
- A "Peer-to-Peer" section lists articles (and links) that readers of this article have also accessed.
- Finally, this citation page contains a review of the paper from *ACM Computing Reviews*.

Searching the Portal The ACM Portal can be directly searched by anyone for terms in the title, author list, abstract, or review, by ISBN/ISSN, publisher, date, journal, type of publication, DOI, conference sponsor, conference location, classification, subject and/or keyword. Under an Agreement, Google (http://www.google.com) now indexes the entire contents of the ACM Digital Library, and *TODS* articles in DBLP (http://www.acm.org/sigmod/dblp/db/index.html) are linked to their ACM citation page.

Table of contents by email ACM, Student and SIG members can request an email alert of the table of contents of new *TODS* issues.

As this list indicates, ACM in the last decade has augmented *TODS* with an extensive array of web-based facilities to aid the author, reviewer, Associate Editor, and especially, the reader. This effort has cost several million dollars and greatly benefits the scientific community.

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