Strategic Directions for ACM Publishing 2001–2004

Becoming the Preferred Computer Science Publisher

ACM Publications Board[†]

Approved by Council June 2, 2001

Abstract

The vision underlying the strategic plan discussed here is simple:

Ensure that ACM becomes the preferred publisher for computer science.

This objective can be accomplished through four specific tasks.

1. Articulate a set of rights guaranteed by ACM to readers, authors, reviewers, editors, librarians, other scientific publishers, and the Association itself. (Section 5)
2. Develop and promulgate appropriate policies and processes for ensuring these rights. (Section 6)
3. Ensure that the ACM Digital Library and Portal provides comprehensive, convenient and permanent online access to all ACM publications and serves as a portal to all computer science literature. (Section 7)
4. Proactively seek out and respond quickly to new publication opportunities and changing publication interests of ACM members and the computer science community. (Section 8)

This document starts with a longer-term analysis of where the Board sees publications in general going, three to ten years out. We then focus on the strategic implications of the above overarching vision and the four tasks listed above. Once this strategic plan is adopted, we (the Publications Board) can determine appropriate tactics and policy to achieve this vision. Having a simply stated, shared vision facilitates identification of relevant strategic directions.

1 Introduction

ACM has a high quality publishing program, with a talented and dedicated staff and effective volunteers maintaining quality publications. We seek to go further, to realize ACM CEO John White's stated vision of ensuring that ACM becomes the preferred publisher for computer science.

ACM is already well on its way towards this ambitious goal. In this document, we examine both sides: the areas in which ACM already has established a preeminent position among computer science publishers, and the areas in which ACM must improve to achieve that position. We must be careful to retain the good qualities when addressing those areas where we fall short. It is also important to note that this vision is ultimately unattainable, as being the best at *every* possible criterion is impractical. We

[†]We thank the ACM Council, Krzysztof Apt, Alex van Lamsweerde and John White for helpful comments on a previous draft.

need to approximate this goal to the extent possible, given constraints on volunteer effort and available resources. One way to circumscribe this effort is to focus on the highest quality computer science publications, leaving the rest to other publishers.

Within this strategic plan, we endeavor to consider resource constraints and to indicate the relative priority of each activity. We also try to make the goals specific, to more easily determine whether each has been met, and provide a time frame for achieving the objectives. We attempt here to also institute a process that can provide objective feedback on the outcomes of the publications effort over the next three years (see Section 6); we feel that some can be achieved in the first portion of that period.

That said, the stated deadlines should be interpreted as indicators of short-term, medium-term, and long-term objectives. It is expected that some tasks will turn out to be harder than expected, and so will be delayed, and that some tasks will need to be reevaluated and perhaps fundamentally altered as we delve into their specifics.

A "three-year strategic plan" is somewhat of an oxymoron; many would consider such a document to be more of a tactical plan. We agree that short and medium term objectives should be consistent with a longer-term strategic direction for ACM publications. While necessarily more fluid and controversial, such a direction is discussed in Section 4 as a structure for further planning and initiatives by the publication Board and staff.

2 Scope

ACM publishes books, journals, magazines, conference proceedings, and SIG newsletters. Certain responsibilities for Proceedings and SIG newsletters have been delegated to the SIG Governing Board (SGB) by the Publications Board, and so will be discussed only peripherally here (though it is our intent to work closely with the SGB to ensure that over time all ACM publications realize this shared vision). The book market (textbooks and research monographs) is extremely competitive, with many publishers, several of which are dominant. It is doubtful that ACM can, without massive investment, become the preferred computer science book publisher. For this reason, the Board decided at its October 2000 meeting to terminate the book program. It is also doubtful that ACM can become the preferred publisher of trade press magazines.

In the following, we limit to scope of publications for which ACM will attempt to become the preferred publisher to information technology journals, magazines, and electronic-only publications, including the Digital Library (DL).

Before we elaborate a strategic plan to become the preferred publisher for computer science, we review the status and accomplishments of the most recent three-year plan.

3 Previous Strategic Plan

The previous three year strategic plan (1997–2000)[1], consisted of ten areas, as defined in the "octopus" diagram[2]. Each area, its definition, and summary is listed below.

1. Infrastructure : the capability to develop, produce, and incorporate electronic files, databases, and other components into the ACM Digital Library; also, the capability to enhance the entire publications workflow.

- complete Phase 2 of the Electronic Publishing (EP) Plan (more formats like HTML, XML; improve Electronic Publishing processes);

[1] `http://www.acm.org/pubs/board/strategic.html`
[2] `http://cne.gmu.edu/pjd/ACM/acmep.pdf`

- complete Phases 3 and 4 of the EP plan: add streaming video; referee tracking capabilities;
- DL Research projects (Stanford, Cornell, NCSTRL); provide research initiatives access to DL as needed.

Summary: By the end of this calendar year, CACM and the magazines will have their articles also available in html form. As a result of a collaboration with the University of Illinois, ACM journal articles will appear (during calendar 2001) in html form. As a result of recent Publications Board initiatives, significant changes have been made, and continue to be made regarding the improvement in EP processes to create a better publishing environment for authors, editors, and readers. ACM has made parts of the DL available to Cornell, Stanford and NCSTRL.

2. International : create virtual regional editions; regional contributions to preprint repository.

Summary: Although the specific goals mentioned above were not implemented, the Board is pleased to note that a number of the journals now have Editors-in-Chief outside of North America (*TOSEM*, *ToCL*, *Calgo*, *interactions*). In addition, a new *Transactions on Asian Language Information Processing* has been approved, and the Editorial Boards of the journals now contain members from many different countries. Recently, there have been serious discussions with the BCS (British Computer Society) with regard to several initiatives, including having their publications included in the ACM DL.

3. SIG/Track 2 Collaboration : work with SIGs interested in evolving their newsletters to magazines; SIGCHI/interactions as a model; electronic-only SIG publications.

Summary: Intelligence magazine is an example of this initiative. SIGART has evolved its bulletin to a magazine by working closely with the magazine staff at HQ. SIGART provides the intellectual content, and staff provides the design, production, and non-technical editorial information. Other SIG collaboration includes moving the SIGDOC newsletter into a formal *Journal on Computer Documentation*, and working with SIGCSE to develop an electronic-only *Journal on Educational Resources in Computing*. The electronic-only *TechNews* and *Ubiquity* have also been started.

4. Professional Update Program : creation of CDROM and/or web-based products that provide users with a set of readings, followed by a test. Upon successful completion, a certificate attesting to the reading knowledge of the user in that area would be provided.

Summary: This project was moved to the responsibility of the Education Board.

5. Licensing : of Digital Library content to institutions, consortia, and aggregators. Long-term archiving and persistent access policies; international.

Summary: A significant revenue stream has been developed by licensing the DL to libraries, consortia, and corporations. The combination of vast content, good service, and attractive pricing has created a very positive feeling on the part of the libraries. The Board has recently adopted a policy statement regarding long-term archiving, which was presented to the ACM Executive Committee. The Board expressed a concern that there could be a negative impact on membership as more and more libraries and consortia acquire the DL. This is being monitored.

6. Personal ACM : developing products and services to enhance the value of ACM membership/ DL subscription. Includes but not limited to: profiles and alert services; author virtual bibliographic pages; links to external home pages.

Summary: A "binder" capability has been developed for DL subscribers, where searches can be saved, email alerts can be received, and expanded searches are provided.

7. DL Content and Services : includes retrospective capture of all journals, proceedings, newsletters, and books; capturing of proceedings abstracts; providing forum capabilities to discuss articles; integration of Guide/bibliographic databases into DL; developing new areas of publishing based on DL usage; developing pricing and policies for electronic-only advertising.

Summary: All journal articles and most conference articles are now in the DL; proceedings abstracts currently being captured in HTML form; forum capabilities now exist in the DL, as well as *Ubiquity*, and soon, in *TechNews*; and the Board provided input to Staff in developing online advertising plans.

8. Copyright : clean up interim policy; option for author-retained copyright; definitive and online corrections.

Summary: The Board completed the clean up of the Copyright policy; this policy has been a landmark, in that many organizations have used it as a basis for their policies.

9. Track 1 (Research) : electronic refereeing; technology transfer; "distinction" (certification); exploit DL; Preprint Service.

Summary: Electronic refereeing has not been developed yet. It is tied to several other initiatives (*Computing Reviews*; referee tracking, etc.). "Technology transfer" refers to creating Track 2 publications by "rewriting" Track 1 type research results. This has not been attempted yet. "Distinction" refers to the certifying of a paper as meeting ACM's quality standards, without necessarily specifying a journal for that paper. This too was not addressed. An ACM-sponsored preprint service, *CoRR* was initiated.

10. Computing Reviews : as a front end to the DL literature; cease print?; relation to referee tracking and electronic refereeing.

Summary: A plan has been developed to use a vendor to produce CR while having the vendor provide a number of services such as electronic reviewer tracking and administration; this plan is now being implemented; the Forum capability that now exists in the DL was provided by this vendor.

Some of the unaddressed aspects of the previous strategic plan are included in this next strategic plan.

1. Infrastructure A staff/volunteer committee has evaluated various manuscript tracking packages, and has delivered its recommendation (see Section 5.1).

2. International More needs to be done (see Section 5.7).

3. SIG/Track 2 Collaboration Much more needs to be done (see Section 8).

4. Professional Update Program This is no longer under the Publications Board.

5. Licensing There is still much more to do, particularly in more aggressively selling the DL to the corporate market (see Section 7).

6. Personal ACM The components of this section other than a binder capability are just now being developed (see Section 7).

7. DL Content and Services Guide integration is now part of Portal project, and appears in this next three-year plan (see Section 7.1). Developing new areas of publishing based on DL usage is also a future project (see Section 7).

8. Copyright Monitoring of the copyright policy with respect to relevance, new technologies, legislative and political developments, etc., needs to be continued (see Section 5.1).

9. Track 1 (Research) The next three-year plan will incorporate some of the "exploit DL" elements, such as no paper distribution, and enlarged coverage (see Section 7).

10. Computing Reviews Referee tracking is included here (see Section 5.1).

We now turn from the strategic plan covering the period of 1997–2000 to our vision for the next three years. But before doing so, we look further out, to the changes possible over the next decade.

4 A Long-Term Prognosis

Council's request was for a three-year strategic plan. In the following pages, we lay out a strategic vision centered around the goal of ensuring that ACM becomes the preferred publisher of computer science literature. We place the DL and the Web as the focus of all ACM publication activities, and emphasize making `acm.org` the portal to all computer science literature. To follow through on this vision, we advocate a number of tactics:

- Build on strengths: specifically, the DL and a reputation for high quality at low price,
- Seek new constituencies and partners, both within ACM and in the international community,
- Significantly expand DL services,
- Seek new content, and
- Improve internal operations.

The longer term, three to ten years out, is much less certain. The role of STM publishers in knowledge propagation is being fundamentally reexamined. Some prominent members of the research community feel that it is no longer appropriate to yield an author's copyright to a publisher, for the privilege of being published. Many question the large profits that some commercial publishers extract from readers and libraries; some even question the common practice of scholarly institutions, ACM included, of using profits from publishing to fund other activities, regardless of the desirability of those activities. As subscriptions shift from print to electronic, distribution costs go down (though not as dramatically as some claim, and production costs remain high), and readers expect cheap or free access to scholarly works. Self-publishing by posting on one's web site and using comprehensive search engines erode the value of ACM's imprimatur (or may come to increase that value). Business models departing from the "reader pays" approach institutionalized over the last century are being considered. As but one example, free electronic journals are being offered, though their continued viability is still an open question. Indeed, even the concept of "journal" is being reexamined, with the Board starting to consider overlay journals in the DL containing articles collected from several existing journals, as well as submissions to the DL proper in addition to those to a specific journal.

The Board views the overarching vision, the strategies, and the specific tactics enumerated in this document as appropriate in this time of great change. The Board continues to discuss the evolving landscape, in an attempt to understand what it portends the new role that publishers will play. Certainly the instability of publishing in this new internet age argues that ACM should diversify its revenue stream, so that it is less dependent on profits from publications. And the Board needs to ensure that its policies continue to meet the needs of the many constituencies listed in Section 5, while working with Council and staff to ensure ACM's enduring viability.

5 Becoming the Preferred Publisher

ACM publications have relevance to several constituencies: authors, readers, reviewers, editors in chief (EiCs), associate editors, institutional subscribers, other scientific publishers, and the Association itself. We desire that the policies, publications, staff support, and pricing be configured so that *every* constituency is unequivocally convinced that ACM is *their* preferred publisher.

Over the last year, we have spent considerable effort developing the **Rights and Responsibilities in ACM Publishing**[3] which articulates what the term "quality publishing" means to us. That document states some four dozen rights that ACM wishes to provide these constituencies.

In this section, we list some of the challenges before us, and provide specific goals and specific deadlines for achieving those goals. To structure this section, we consider each constituency in turn. In Section 6, we discuss the means by which we will achieve these goals.

5.1 Authors

Authors publish in ACM journals and magazines because they cover appropriate technical areas, are of high quality, and are widely available. ACM publications meet two underlying needs of authors: broad dissemination of (and access to) the work and positive recognition. These needs are achieved through the technical quality of ACM's publishing program, and by its moderate pricing and liberal access policies, all of which are reflected in its reputation and by its imprimatur.

There are several areas where ACM falls short in addressing the needs of authors.

Reviewing time There are two metrics of interest here: the *turnaround interval*, from the submission of a manuscript to the author's receipt of the editorial decision on that manuscript, and the *appearance interval*, from the initial submission of a manuscript to its publication. The second interval includes possibly multiple rounds of review, as well as usually one or more author revisions. Both intervals vary tremendously across the publications, and both are generally far too long, in this age of internet time. The average turnaround interval for each refereed publication needs to be reduced to no more than six months, and the average appearance interval needs ultimately to be reduced to 24 months (for transactions; other publications require even shorter intervals). We feel that this objective can be met by January 2003, through judicious use of good practice, through periodic evaluation of reviewers, associate editors, and editors in chief, and through insistence that authors also provide rapid revisions.

A further reduction to four months for average turnaround and eighteen months for average appearance will require a culture change. Reviewers must come to realize that ACM has significantly reduced its internal processing time, and that there is a shared expectation across the discipline that three months is an adequate amount of time for a quality review. This will require frequent communication with the reviewing community, to articulate the advantages and feasibility of faster article processing.

Finally, authors appreciate not only efforts to reduce the average values of these intervals, but further, that the maximum values also be reduced, i.e., that ACM *guarantee* these intervals. We feel that a 6/24-month guarantee can be implemented within the time frame indicated above. Indeed, such a guarantee will be essential for helping to change the culture, to move to a 4/18 month guarantee.

On-time publication As of January 2000, ACM journals are published on average seven months after the cover date. Authors want their articles to be available in a more timely fashion. There are two

[3] `http://www.acm.org/pubs/rights.html`

basic sources of delay. Some EiCs do not deliver articles on time, and the production process has been unable to get issues out on time.

All ACM publications should be available electronically and in print by the first day of their cover month. This can be achieved by January 2002. All new publications should be on schedule within a year of their commencement.

Status appraisal Authors now view the publishing process as a black box: their article is submitted, at some later time is accepted (or not), and at some still later time comments are requested (within 48 hours!) on the proofs. This behavior is common (but not universal) in scientific publishing, but nevertheless is infuriating to authors. The reviewing and publishing process should keep authors appraised of the status of their article at all points in this process. Doing so will generate considerable good will. An appropriate process has been developed, and should be in place for all journals by June 2001. Additionally, a web-based manuscript tracking system should be put in place, starting with some journals in January 2002 and in place for all journals by July 2002.

Editorial processes and policy The list of author rights should be implemented, attaining the appropriate balance between standardization and customization, with mechanisms put in place to ensure these rights by October 2001. Also, we should continue to monitor the Copyright policy with respect to relevance, new technologies, legislative and political developments.

5.2 Readers

Certainly the largest group associated with a publication is its readers (or at least, hopefully so!) The set of current subscribers is small and decreasing; the set of potential readers is much larger, and increasing. There are several reasons for the steady decrease in subscriptions, including a glut of publications from commercial publishers, the rise of the ACM DL, and an increasing reliance on institutional subscriptions, both print and electronic. Nevertheless, we fee that ACM is failing to meet the needs of its readers in the following sense: 60% of ACM members are non-academic. These people are practitioners who, by and large, are being under-served by the ACM publications program. (The fabulous response the *ACM TechNews* has gotten is one example of the thirst for practitioner-based publications.) This is a market that ACM must tap if it is to survive. Strategies are needed that will result in a net increase in readership, measured using a suitable metric. This is discussed further in Section 8.

Low cost subscriptions ACM has an admirable record in terms of its pricing of all publications. The Digital Library is especially attractive in its pricing. However, we should actively work with the SIGs in developing innovative pricing models, to encourage wider availability.

Availability of electronic and print editions ACM needs to continue digitizing past content, so that *all* content is in digital form. Also, other distribution formats should be considered, as discussed in more detail in Section 7.

On-time publication Readers expect a publisher to honor its stated publication schedule, as discussed above.

Relevant areas The desire by readers for relevant journals and magazines includes areas outside of the existing expertise within the SIGs. This need is being partially met with the introduction of third-party material in the Digital Library. However, the continuing downward trend of transaction subscriptions also needs to be aggressively countered. Other kinds of products, such as tutorials, should be considered, throughout the next three years (see Section 8).

Existing ACM publications should be monitored for signs of declining interest or changing scope. The Publications Board should review each publication at least once every three years to monitor subscription and submission rates and shifts in editorial focus. Shifts in focus are usually not negative, but the Publications Board should be aware of them and take them into consideration in overall publications planning. In some cases a new publication may be needed to fill a gap left when a publication shifts in a new direction. In cases where interest in a publication seems to be severely declining, the Publications Board should consider changes that may increase interest in the publication, as well as the possibility of discontinuing that publication.

Ease in searching Readers desire that articles be identifiable via conventional search strategies (authors share this desire). Searching is overwhelmingly done via search engines such as Google, CiteSeer, Yahoo, AltaVista, and HotBot. Webizens (current readers and especially potential readers) will not tolerate idiosyncratic search engines nor engines that impose hurdles such as creating an account. This argues for free access to meta-data, in appropriate format(s) for indexing by web search engines. (Whether this extends to meta-data for non-ACM material still needs to be decided.)

Bibliographic reference pages ("citation pages") for all DL articles are already freely available to the public and accessible by Web search engines. It is possible to get these pages in response to a Web search. It's just not likely[4]. This need should be achieved by July 2001.

5.3 Reviewers

Reviewers are critical participants in this scientific publishing venture. They are far more numerous than EiCs and Associate Editors. They receive less recognition for what they do, yet put in more time per submission than editors. There is anecdotal evidence that some reviewers are turned off by their interaction with ACM, and refuse to review subsequent articles, or refuse to do so in a timely manner. ACM has to do a much better job of managing its relationship with reviewers.

Reviewers will appreciate the rights that we have identified. However, we should develop a uniform process through which reviewers feel appreciated and respected and be treated with consideration throughout the process. Additionally, we should find new ways of letting reviewers know that their contribution is valued. The reviewing process should be made as smooth as possible. Adoption and careful integration of a manuscript tracking system should help.

5.4 Editors in Chief

Unlike some commercial publishers, ACM does not pay its EiCs, in part because doing so is counter to low subscription rates[5]. (The rationale for not paying reviewers is even more compelling.) Many of the same requirements above for reviewers (making them feel appreciated and respected, treating them with consideration) apply equally to EiCs.

At the present time, EiCs are basically on their own, with little support from ACM. The long standing ACM traditions for running a journal are buried in an unusable, incomplete, inaccurate, and

[4] We have been looking into this, though don't really know the reason. Perhaps these pages are buried too deeply in the ACM Web to be extracted by most engines. Perhaps article titles don't appear prominently within the HTML. This could be fixed by including metadata tags. In any case, pages in DBLP (`http://www.acm.org/sigmod/dblp/db/index.html`) do appear in web searches, so there must be a solution. Perhaps we should also try submitting the DL URL directly to the major search engines, and if that doesn't work, contact them to find out what the problem is.

[5] ACM *does* provide limited funds to EiCs for secretarial support.

generally unavailable policy manual and a few people's corporate memory; these processes need to be made explicit and communicated effectively to EiCs and editorial boards.

We are now evaluating tracking software for use by editors and reviewers. This software should be in place by December 2001, and will be an important component in reducing turnaround and appearance intervals. Additionally, orientation sessions for incoming Editors-in-Chief as well as new Board members would be useful.

5.5 Associate Editors

There is an order of magnitude more associate editors than EiCs. While the editorial boards are under the direction of the EiCs, the publications staff can nonetheless provide support, and we can provide coherent policies and mechanisms for handling submissions. Support for the associate editors in their handling of articles will be an important topic of discussion with the EiCs, and is an important feature of the tracking systems we have been evaluating.

5.6 Institutional Subscribers

For ACM's scientific journals, the bulk of subscriptions, both print and electronic, will be to libraries, library consortia, and company subscriptions. These institutional subscribers have somewhat different needs from readers. They of course share the desire for low subscription rates. The consortia rate structure that ACM has developed is appropriate, and should be kept low (though demand may be inelastic at these low levels, indicating a possible raise in rates to provide funds for other publishing needs).

Also of interest to institutional subscribers is a stable mix of products. Issues should be brought out on time, meta-data should be accurate, and combined issues (e.g., volume 3/4) should be avoided.

We should perform more outreach with a small group of representative institutional subscribers to better understand their needs. Anecdotal evidence indicates that ACM is in good shape relative to commercial publishers, but less so relative to other non-profit publishers. At least two meetings with librarians should be carried out over next three years.

5.7 International Readers and Authors

ACM is an international society, but is regarded by many to be US-centric, for a variety of reasons. Yet there are also significant efforts within ACM to serve members and the research community who reside outside of the US. The editorial boards of ACM journals are truly international in scope, conferences are increasingly being held outside the US, and ACM invests considerable resources to deliver digital content internationally.

The ACM publications should be deparochialized. *TechNews* is primarily addressed to a U.S. audience. References to "the government" betray a US bias. We should reach out to volunteers to identify parochialization, as a first step in removing it.

5.8 Other Scientific Publishers

ACM should incorporate the best practices of other computer science publishers, as well as publishers in other domains. In this regard, we should undertake a study of other superlative publishers to suggest ways in which ACM could improve its policy and practice.

It is somewhat ironic that the ultimate goal is for other publishers to equal ACM in their commitment to readers, authors, editors, reviewers, and institutional subscribers. In becoming the preferred

publisher for computer science, ACM will provide a positive role model for other publishers, commercial and non-profit. ACM should provide a gold standard against which other publishers can compare themselves. If publishers adopt these practices, then eventually ACM won't be *the* preferred publisher, but will be only one among many superlative publishers. In this role, ACM should cooperate when possible with the best of the other publishers (the IEEE Computer Society being an obvious candidate).

5.9 The Association Itself

The publications provide ACM with approximately $400K per year in profits. The pricing model for these products also provides benefits to ACM members (indeed, some report that the publications are the primary benefit of ACM membership). Finally, the publications provide highly positive visibility for ACM, attracting new members.

Revenues from ACM publications is a significant and important income stream for the Association. While a significant part of this income is re-invested in publications, the investment levels must be balanced with other ACM objectives and initiatives. Council and the Board should work with the CEO, COO and Directors to ensure that the right balance is reached in investing to meet the objectives of this Three Year Strategic Plan.

6 Achieving Appropriate Policies and Processes

It is irresponsible for ACM to make promises that it cannot keep. For this reason it is critical that we develop appropriate policies and processes (both reviewing and production) that enable the Association to state that it can deliver on its promises.

The Capability Maturity Model (CMM) was developed at the Software Engineering Institute at Carnegie Mellon University to assess the ability of software development organizations to deliver high-quality products within stated costs and time frames. This framework, which has been used to formally assess many organizations, differentiates immature from mature software organizations, and recommends a specific set of improvements to go from an immature to a mature organization. The CMM has been applied to software development, to software acquisition, to total quality management, and to systems engineering. It provides a framework that can be adapted to assess the ability of ACM to deliver high-quality publications within stated costs and time frame and to suggest a path to improved service.

"In an immature software organization, software processes are generally improvised by practitioners and their management during the course of the project...there is no objective basis for judging product quality or for solving product or process problems."[6] Unfortunately, that accurately characterizes the current ACM publication process. "In a mature organization, managers monitor the quality of the software products and customer satisfaction. There is an objective, quantitative basis for judging product quality and analyzing problems with the product and process...This framework describes an evolutionary path from ad hoc, chaotic processes to mature, disciplined software processes."

The CMM organizes this path into five maturity levels, each a well-defined evolutionary plateau toward achieving a mature process. In the following, publication terminology will be used, in place of the software development terminology employed in the definitions found in the CMM.

[6] These quotes are from Mark Paulk, Bill Curtis, Mary Beth Chrissis, and Charles Weber, "Capability Maturity Model for Software, Version 1.1", CMU/SEI-93-TR-024, February, 1993, `http://www.sei.cmu.edu/publications/documents/93.reports/93.tr.024.html`.

1. *Initial*—The publication process is characterized as ad hoc, and occasionally even chaotic. Few processes are defined, and success depends on individual effort, such as by the journal editor or managing editor.

2. *Repeatable*—Basic project management processes are established to track the schedule. The necessary process discipline is in place to repeat earlier successes on publications with similar characteristics. Best practices are communicated, e.g., between EiCs, and promulgated.

3. *Defined*—Both the reviewing and production processes are documented, standardized, and integrated across all publications. All publications use an approved, tailored version of the Association's standard publication process.

4. *Managed*—Detailed measures of the reviewing and production processes and publication quality are collected. Qualitative feedback from all constituencies is regularly collected, via the web when appropriate. The publication process is quantitatively understood and controlled.

5. *Optimizing*—Continuous process improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.

As an example, one of the bullets in the Rights and Responsibilities document states that "authors can expect ACM to issue timely review" of their submission. For ACM to guarantee this service, there needs to be a process in place that has been shown to provide timely review for most submissions, with a short tail to this distribution. At the present time, a CMM assessment would characterize ACM's processes as *Initial*. While there is a general understanding of the reviewing process shared among editors and reviewers, we have no knowledge of which journals provide acceptable reviewing times, and which regularly exhibit unacceptable reviewing times. There isn't even a documented reviewing process. (Actually, there *is* a documented review process, but the problem is that this documentation is buried in publication policies and procedures manuals and needs to be brought to light and made part of EIC orientation as well as modeled in the peer review tracking system.) The timeliness of the review is now based solely on the associate editor or EiC handling the article. We have little understanding of what changes can increase timeliness, or indeed, which editors are timely.

Once a reviewing tracking system is in place, we can define appropriate workflows, tailored to each journal. Then, and only then, can appropriate metrics of timeliness be defined and monitored. At that point, feedback from those measures can improve the reviewing process. The reviewing process can thus move from *Initial* through *Repeatable* and *Defined* to *Managed* and finally *Optimizing*, transitions that will take several years to fully implement throughout the publications process.

As another example, a bullet guarantees that "readers can expect ACM to publish on time." We depend on EiCs to maintain a reasonable backlog of accepted articles, but until recently ACM wasn't tracking the backlog, with the result that many of the journals currently have an inadequate backlog. For such journals, we have no guidelines and few suggestions for how to increase the backlog. Again, a CMM assessment would characterize ACM's backlog management as *Initial*, with the four other levels providing explicit steps to be taken to ensure a backlog within tightly prescribed boundaries, which is a requirement if ACM is to publish on time.

Much of the ACM publication process is currently at the Initial maturity level; a few components are perhaps at level 2, Repeatable. The Publications Board will look at all components, with the guarantees of the Rights and Responsibilities document as a starting point. We will attempt to raise the entire publication process to level 2, Repeatable, within a year (by December 2001), to level 3, Defined, by June 2002, and level 4, Managed, by June 2003, and to level 5, Optimizing, within three years (by June, 2004). We must do so while maintaining the EiCs' prerogative to innovate, and without overly constraining authors, editors, or reviewers. Rather, our purpose should be to provide processes

and tools which enable authors, reviewers and editors to focus on maintaining the high quality that ACM publications have enjoyed.

It should also be emphasized that we view CMM to provide a paradigm of measurement and iterative improvement, as well as an informal, but still quite useful scale. There is not currently a CMM for publication, and it is not our intention to develop one, as that in itself could occupy the entire Board's effort for several years.

At another level, the interaction between volunteers, specifically the Board, and the publications staff needs to be rethought. There needs to be more support for the Board from the staff. The staff has been quite successful at implementing initiatives proposed by volunteers, e.g., the DL, the nascent Portal; what is needed is better handling of details, so that the Board can focus on strategic issues. On the other hand, the Board realizes that staff resources have been inadequate for several years, and so the staff have few cycles to devote to Board support.

7 The ACM Digital Library and Computing Portal

The Digital Library stands today as a notable ACM achievement. It provides ACM members with significant new benefits, and has proven to be an extremely useful resource for the scientific community. A central strategy to becoming the preferred publisher for computer science is to ensure that the ACM DL provides comprehensive, convenient and permanent online access to all ACM publications. In order to achieve this goal, continued aggressive development of new content and services must be undertaken. The production systems behind the DL must be solidified, carefully maintained, and updated in order to keep the DL at the forefront of digital library technology. Current trends indicate that print publication of technical journals and conference proceedings may cease to be cost effective within a few years. The DL will could become the sole means of access to much of ACM's technical literature. ACM must continue to adjust its practices and its business plans in order to meet this likelihood.

With the DL as a firm foundation, ACM must aggressively pursue the goal of providing a comprehensive, full-featured portal to computer science literature. The ACM Computing Portal would potentially encompass all of the computer science literature, providing a variety of browsing capabilities, search tools, reference linking, and links to full-text, both within and external to the ACM DL. The steps needed to make this a reality are (a) expanding content, (b) expanding services, and (c) improve internal operations. Finally, ACM must develop innovative economic models for new ACM Portal and DL benefits in order to insure its continued maintenance and availability.

7.1 Expanding DL Content

The Computing Portal project will provide a window from `http://acm.org/` to all computing literature. As a first step, we need to make the DL a comprehensive collection of all ACM literature. ACM is currently implementing an aggressive program to complete the capture of the technical content of all ACM journals, magazines, and conference proceedings for mounting in the ACM DL. This admirable program distinguishes ACM from most other professional societies. Other content should also be added to the DL to increase its holdings.

- Complete the capture of all past ACM journals, magazines and conference proceedings for inclusion in the ACM DL, by June 2001.
- Extend DL holding to other types of ACM content, such as
  - Crossroads, by June 2002. Crossroads metadata is currently searchable in the DL, but the existing mechanism is weak. Mechanisms for more closely integrating Crossroads content

into the DL should be investigated.

  - SIG newsletters, by December 2001. A mechanism for integrating newsletters should be in place by the target date, and some examples should be available.
  - ACM Press books or book chapters, by June 2002.
  - Special reports, such as curricula and self-assessment procedures, by December 2001.
  - Work with SIGs to realize the Portal in the DL, by June 2002.

- Mount preprints of accepted articles in the ACM DL for journals with significant backlogs.

  Some ACM journals provide immediate online access to accepted articles. This practice has not been uniformly adopted, and, although a procedure for integrating such preprints into the DL has been proposed and implemented, it is not in common use by EiCs. It should become familiar and in common use by June 2001.

- ACM should continue to seek strategic alliances with other publishers (e.g. IEEE, SIAM) which would allow DL searches to be performed over a wider body of literature. Another example is CoRR. The goal here is to provide DL subscribers with access to a broad range of other computer science literature.

- Seek opportunities for the permanent inclusion of material by other publishers within the ACM DL.

  The ACM DL is an attractive venue for mounting content by smaller publishers who do not have the resources or critical mass to develop online DL's of their own. ACM should exploit this need to the benefit of DL subscribers.

- Support "open archive" publishing of technical reports, such as CoRR, and work to include such literature into the portal.

7.2 Enhancing Functionality

It is critical that the ACM DL will provide its subscribers with effectively administered value-added services which significantly enhance the usability and impact of its holdings.

ACM recently mounted discussion forums for each article within the ACM DL in which ACM members may participate. This is an example of enhanced DL functionality. ACM must continue to develop more if it is to maintain the interest of the technical community. Examples include the following.

- Bibliographic home pages for authors, i.e., a page (or a process) that displays all the works known to the ACM bibliographic database by the given author, by June 2001.

- An email-based service that alerts members of new DL content based upon their technical interest profiles, by June 2001.

- The capability to link bibliographic references within articles published in the DL to other DL articles they reference, by June 2001. Extend to external journal articles by December 2001, and to other types of material (e.g., external conference proceedings) by December 2002.

- DL content in other formats, such as recordings, videos, and educational applets, by September 2001, with facilities for search in such material by December 2003.

- Integration of the ACM bibliographic database in the DL, so that ACM DL searches can potentially retrieve material from the computer science literature at large, by June 2001.
- Browsing capabilities for DL articles based upon formats such as HTML and MathML, by December 2001.
- Develop a quality labeling facility for DL content, so that users can easily distinguish between refereed, reviewed, unreviewed, and non-ACM content, by December 2003.
- Consider portals for specific research areas.

  As ACM migrates to pure electronic publication with Web-based access, journals and conference proceedings are viewed more as input streams to the DL, controlled by permanent or ad-hoc editorial boards. Over time, this material will be integrated with a variety of other content, including non-ACM material. When the results of a search are presented, a user must be able to easily assess the pedigree of the data retrieved.
- Consider other distribution formats.

  ACM currently employs PDF as its electronic full text format. Other recently developed formats that download faster should be investigated, as many readers, in particular outside the US, have slow internet access. Other media such as CDROM, DVD, and streaming audio-video from the net should also be considered.
- Include metadata tags in the HTML for DL citation pages, by July 2001.
- Track research and standardization of technologies such as MathML, so as to be ready to exploit their potential for display, interactivity, and interoperability as soon as feasible.

7.3 Improving Operations

It is important to provide a solid base for the continued maintenance and enhancement of the ACM DL as well as smooth transition to the Portal. ACM must develop innovative economic models for new ACM Portal and DL benefits in order to insure its continued maintenance and availability.

Other areas that need emphasis are improvements in DL search and download speed, accuracy of DL metadata (i.e., information and links in citation pages), connection with community-based efforts in indexing and retrieval of digital objects, and mining of access data associated with the DL.

- Develop a single database system within which all of ACM's publication data will be integrated, by June 2002.

  Today three separate databases are used in the production of ACM publications. This increases overhead cost, leads to errors, and hampers the development of new services.
- Improve the performance of the DL searching tools, and develop effective internal procedures to avoid and quickly correct errors in DL metadata, by December 2001.

  Maintenance of reliable metadata will become a very important issue as more external links are provided in the DL.
- Label all DL content with Digital Object Identifiers (DOIs), and use a metadata database to link ACM-assigned DOIs to current URLs, by June 2002.

  Support of rich linking of articles, both internal and external to the DL, requires a reliable and permanent identifier for articles and other DL content. It appears that the best hope for this is the

DOI as implemented by CNRI for the IDF. The DOI is a unique and permanent id is assigned and deposited for each published work. The DOI itself links to a resolver which returns the page pointed at by the link associated with the DOI. Links are maintained by the copyright holders of DOI content or their agents.

- Integrate DOIs into the ACM internal bibliographic database, by September 2001.
- Develop a system for reporting of DL access statistics appropriate for ACM staff, EiCs, and institutional subscriber, by September 2001.
- Tools for mining Web logs should be extended and applied so that new dynamic features can be added to the DL, such as
  - Top ten most requested articles, by March 2002.
  - Automatic identification of "hot topics", by December 2002.

8 New Publications

As the interests of ACM members and the computer science community evolve over time, it is important that ACM be proactive about seeking out and responding quickly to new publication opportunities and changing publication interests. To meet this goal, ACM will need to increase the resources available for publication acquisition so that a full time senior staff member can oversee this process. This "acquisitions editor function" will monitor evolving computer science interests by attending conferences, get to know key people in the field, and monitor relevant publications published by ACM as well as other publishers.

The following specific initiatives should be pursued, with the assistance of such an acquisitions editor function include the following.

- Establishing more Track II publications and other non-journal publications. The acquisitions editor and Publications Board should look for areas where magazines, online newsletters, tutorials, and other non-journal publications might be successful. In particular, efforts should be made to coordinate with SIGs to establish new publications or to turn SIG newsletters into more general-interest publications; consider the possibility of creating online newsletters or magazines that feature magazine-style versions of ACM journal articles; and reach out to non-academic ACM members to find areas of interest to this group.
- Establishing moderated mailing lists as a new format for ACM publications. A number of ACM members moderate large, well-respected electronic mailing lists—some even sponsored by ACM. But ACM currently does not provide infrastructure support for these mailing lists or consider them as ACM publications. The Publications Board and acquisitions editor should survey moderators of successful mailing lists to determine what services ACM should provide, and develop a plan for providing these services and recruiting and launching several such lists. The plan should also include an approval process for establishing new moderated mailing lists with ACM sponsorship.
- Recruiting high quality journals published by other publishers. Periodically the editors of high quality computer science journals not published by ACM become dissatisfied with their publishers and look for alternative publishers. ACM should pursue such journals, and if they appear to be a good fit for ACM, should act to negotiate quickly with the editors to turn these journals into ACM publications.

- Establishing journals in new areas where there is an opportunity to offer one of the first journals. The ACM acquisitions editor should look for emerging areas of computer science that are not well covered by existing journals, and look for top researchers in these areas to propose new journals. The acquisitions editor should work with potential editors and help shepherd them through the publication approval process.

- Consider establishing an ACM "selected papers in computer science" journal. The Board should consider non-traditional approaches, including a "virtual journal" that would designate the best papers from other ACM journals (and possibly conferences) in an online "publication."

- Investigate possible relationships with the WWW Consortium (W3C), with computing-related conferences not currently affiliated with ACM, and with scholarly publishers, such as the British Computer Society, for both Track I and Track II publications.

- Expand the quantity and scope of non-journal literature and other materials in the DL to include more multimedia, software, experimental results, recordings of conference presentations, tutorial materials, etc.

- Develop innovative economic models for new ACM publications that ensure that these publications remain financially viable while meeting the needs of the computer science profession. Alternatives to traditional subscription models should be explored.

This strategic plan is very ambitious, with many specific goals, requiring much work by the Board, by Council, and by the staff. It will be deeply satisfying to accomplish even a subset of these goals, as we work towards the vision of becoming the preferred computer science publisher.