Our Past as a Prelude to our Future

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Computing has evolved faster than perhaps any other discipline. The advances in hardware, software, and theory have been staggering. Such progress engenders a narrow focus on the *the next thing*.

ACM was formed in 1947, when computing itself was just getting started. But the prevalent focus on the future has left a gaping hole in our knowledge: while there is a growing literature on the history of computing, there is little on the history of ACM.

Why is this important? The history of ACM is in many respects the history of computing. The story of how computing originated and how it got to where it is today cannot be told without also understanding how ACM originated and evolved. What was the impetus for the current eighteen transactions and six journals published by ACM? What was the genesis of the 34 current Special Interest Groups, and (perhaps just as importantly), the factors influencing the rise and fall of those SIGs no longer with us? Where did early (and middle) leaders see the field going; in what ways were they prescient and in what ways were they mistaken? What does the last fifty-odd years of ACM tell us about the next ten years, the next fifty years?

Our experience with the ACM Portal is that older material is disappearing. There are ACM conferences for which no printed proceedings can be located. In the last several months, four ACM Turing Award winners have died. Few of those present at the founding of ACM are still alive (Robert Campbell passed away July 1.). We are losing our past.

Finally, it seems appropriate for the leading society of information technology to use that technology to record both where it has come from and where it is going.

This white paper proposes a comprehensive, coordinated effort over the next two years to document ACM's history, culminating in the announcement at the 2005 ACM Awards Dinner, when the ACM Turing Award is given, of the following.

- A coffee-table-style book, entitled something like "ACM: The First Fifty Years," offering for the first time the origins and evolution of ACM from 1945 with pictures, history, and interviews, and linking this history with that of computing in general.
- A more scholarly book drawn from the same sources but providing much more detail and historical information on how ACM has grown and handled the challenges that have confronted it over the last fifty years.
- A multimedia web site, the *ACM Historical Archive*, making available for current and future generations of ACM members and historians digitized source documents, statistics, interviews, photographs, and videos, from the entire spectrum of ACM's activities, including publications, SIGs, and Boards.
- A separate Turing Award web site, containing a digital version of every single document ever written by every ACM Turing Award winner, along with interviews and ancillary information.
- A book entitled "Turing Award Lectures: The Second Twenty Years 1986–2005".
- A DVD-ROM containing all of this electronic material. The DVD would be bundled with the coffee-table book, as well as available separately.

These resources would provide valuable material both to content researchers and to historians of science, would promote ACM's activities, would serve to illustrate and emphasize ACM's involvement in all aspects of computing, and would solidify ACM's position as the preeminent computing organization.

1 Context

Here the various materials currently available are listed, in three general categories: the general topic of "History of Computing," ACM-specific historical material, and efforts by other organizations to document their institutional history.

1.1 History of Computing

- ACM SIGPLAN sponsored two conferences, in 1978 and 1993, on the history of programming languages (HOPL). There was also an ACM Conference on the History of Personal Workstations in 1986. Each conference has an associated proceedings in the ACM DL.

- Several SIG newsletters have articles on subtopics. An example is Denise Gürer's "Women in computing history," ACM SIGCSE Bulletin, June 2002[1].

- MIT Press has a series on the History of Computing, with 25 books. Amazon.com lists another 40 books on that topic, such as **A History of Modern Computing** by Paul E. Ceruzzi (2000) and **An Annotated Bibliography on the History of Data Processing** by James Cortada (1983).

- ACM has (had?) an "ACM Press History Series," with three books published: **History of Personal Workstations** by Adele Goldberg (editor), 1988, **A History of Medical Informatics** by Bruce I. Blum and Karen Duncan (editors), 1990, and **History of Scientific Computing** by Stephen G. Nash (editor). Also published by ACM, but apparently not in that series, was **Turing Award Lectures: The First Twenty Years 1966–1985** by Robert L. Ashenhurst (editor), 1991.

- ACM supported the six-part video program "The Machine That Changed The World" in the early 1990's, and the two-part "Computer Pioneers and Pioneer Computers" video program that ACM produced with The Computer Museum.

- The IEEE Computer Society has a journal, *Annals of the History of Computing*, 1979 to present. "In an interview recently published in the *Annals*, Bernie Galler remarked that, when helping establish this journal, he fought for a rule that its editors would not accept papers on topics more recent than 15 years old." [2] (SIGPLAN observed that same limit in their history of programming languages conferences.)

- The IEEE established the IEEE History Center in 1980; in 1990, the Center moved to the campus of Rutgers University, which became a cosponsor[3]. The mission "is to preserve, research and promote the history of information and electrical technologies."

- Scholarship in the history of computing remains active. In the past few years, several doctoral dissertations have been written, including three in the last six years from the History and Sociology of Science Department at the University of Pennsylvania. The Charles Babbage Institute at the University of Minnesota[4], formed by members of the computer industry and run by professional historians and archivists, is similarly active in preserving the history of computing.

[1] `http://doi.acm.org/10.1145/543812.543843`

[2] "A View from 20 Years as a Historian of Computing," *IEEE Annals of the History of Computing* 23(4):49–55, October–December, 2001.

[3] `http://www.ieee.org/organizations/history_center/`

[4] `http://www.cbi.umn.edu/`

Of these above resources, perhaps the only one related specifically to the history of ACM is the Turing Award Lecture collection; the video programs ACM produced may have mentioned ACM, but certainly did not go into any depth on ACM's history.

1.2 ACM History

Some material more relevant to ACM was located.

- There are several short histories of ACM. The June 1962 issue of *CACM* included the paper "Fifteen Years ACM" by Franz Alt[5]. The July 1972 issue of *CACM* was a 25^{th} Anniversary issue. It contained the historical article "The first 25 years: ACM 1947–1962" by Lee Revens[6]. The October 1987 issue of *CACM* celebrated ACM's 40^{th} anniversary. This issue included commentaries by Anita Cochran ("ACM: the past 15 years, 1972–1987")[7] and Eric Weiss ("Commentaries on the past 15 years")[8].

- The July 1971 issue of *CACM* included the article "On the ACM Publications Board" (its formation) by Eric Weiss[9]. The July 1972 issue of *CACM* included "Publications in Computing: An Informal Review," also by Eric Weiss[10], in which some of the history of ACM publications was summarized.

- There is a wealth of information in the President's letters in *CACM*, as well as in other ACM publications (such as the article "Recommended future directions for ACM" by Jean Sammet et al. in the December 1974 *SIGCSE Bulletin*[11]).

- *JACM* just published a special anniversary issue, commemorating its fiftieth volume[12]. This issue contains interesting retrospectives from the previous Editor-in-Chiefs (including "Journal of the ACM—The Beginnings" by Franz Alt[13]) and from ACM's Mark Mandelbaum, along with forward-looking articles.

- An early editorial in *ACM TODS* (in the December 1980 issue)[14] gave the history of the first three years of that publication and provided three of the original documents that played a role in this journal's founding: "The Proposal for a New Journal in Database Systems, As Submitted to the ACM Council on January 28, 1975," "A Memo of June 26, 1975, Indicating the Approval of the Proposed New Journal (TODS)," and "A Memo by the Northeast Regional Representative to ACM Council Dated May 2, 1975". These make for fascinating reading. For example, here is a quote from the third memo: "Furthermore, while there has been a tremendous flurry of activity lately in the data base area, caused in part by the excitement relating to Ted Codd's "relational data base" approach, I do not believe for many reasons that this situation will last. In fact, most of the material that currently circulates in this area will be soon forgotten." While this author was certainly mistaken that the excitement of relational databases would die down in the late 1970's, I fear that he is correct that much of the material from that time will be forgotten, though not because of disinterest, but rather because of availability. The same can be said about material from ACM's early years.

[5] http://doi.acm.org/10.1145/367766.367777
[6] http://doi.acm.org/10.1145/361454.361455
[7] http://doi.acm.org/10.1145/30408.30419
[8] http://doi.acm.org/10.1145/30408.30420
[9] http://doi.acm.org/10.1145/362619.362621
[10] http://doi.acm.org/10.1145/361454.361456
[11] http://doi.acm.org/10.1145/382201.382988
[12] http://portal.acm.org/toc.cfm?id=602382&coll=portal&dl=ACM&type=issue&idx=J401&part=journal&WantType=journal&title=JACM
[13] http://doi.acm.org/10.1145/602382.602386
[14] http://doi.acm.org/10.1145/320610.320611

- Several SIGs have historical information in their newsletters, including a history of ACM SIGCHI[15], unfortunately restricted to SIGCHI members, though a photo history of SIGCHI[16] is accessible to all. A history of SIGGRAPH and its conference is in the *SIGGRAPH Newsletter* in its February and August 1998 issues: "SIGGRAPH and the SIGGRAPH conference: the early days" by Robin Williams[17] and "Looking back to SIGGRAPH's beginnings" by Carl Machover[18].

  This is not a comprehensive list; there must be other such articles. A central repository of this historical information, organized by SIG, would be quite useful.

- Several ACM Student Chapters have history pages on the web: Bridgewater College, Indiana University South Bend, John Hopkins, Stetson University, University of California Santa Cruz, University of Illinois, University of North Florida, University of Otago, University of Tasmania. (Again, this is not a complete list.)

- A Google search on "History of ACM" brought up many sites[19, 20, 21, 22], but they all concerned other ACM's (!)

In summary, there seems to be scattered across the ACM Digital Library at least two dozen articles on the history of particular Boards (such as the Publications Board), particular SIGs, and particular publications. There are also some short articles on the history of ACM. However, there has never been an effort to pull this material together.

1.3 Other Institutional Histories

Other similar organizations have undertaken efforts to document their past.

- SIAM has been involved in a project to collect an oral history of that organization and of numerical analysis in general and to place this information on the web. This is a 2.5 year effort, funded primarily with a $220K grant from the DOE.

- The IEEE published **A History of the IEEE Lasers and Electro-Optics Society** by Dean B. Anderson in 1993 and **The IEEE Signal Processing Society: Fifty Years of Service, 1948 to 1998** by Frederik Nebeker in 1998.

- The afore-mentioned IEEE History Center holdings include the "IEEE Archives, which consist of the unpublished records of the IEEE." [23]

- **A Centennial History of the American Society of Mechanical Engineers 1880–1980** by Bruce Sinclair was published by the ASME in 1980.

- The ASCE published **The American Civil Engineer 1852–1974 the History Traditions and Development of the ASCE** by William H. Wisely in 1974.

[15] `http://www.hcirn.com/res/org/sigchi.html`
[16] `http://turing.acm.org:18080/photolib/index.jsp`
[17] `http://doi.acm.org/10.1145/281278.281318`
[18] `http://doi.acm.org/10.1145/279389.279427`
[19] `http://www.acm.edu/intro/history.html`] refers to the Associated Colleges of the Midwest.
[20] `http://www.maxpages.com/allcountry/ACM_History` refers to the Academy of Country Music.
[21] `http://acm.emath.fr/info-us.html` refers to the Agenda des Confèrences en Mathématiques.
[22] `http://www.childrensmuseums.org/history.htm` refers to the Association of Children's Museums.
[23] `http://www.ieee.org/organizations/history_center/ieee_archives.html`

- Terry Reynolds, Charles Forman and Larry Resen co-authord the 1983 book **75 years of progress : a history of the American Institute of Chemical Engineers, 1908-1983**.

These books provide possible models for what ACM could produce.

2 Elaboration

Further details on each of the deliverables of this initiative are now provided.

2.1 Books

The focus of this activity is on collecting historical information, some of which is rapidly being lost, and on assembling this information into a coherent history of the Association. The specific artifacts would be two books, drawn from the same sources but targeted to rather disparate audiences, as well as a collection of lectures.

The first book would be appropriate for members of the Association. It is a large-format, well-designed book, printed on quality glossy paper, with a sophisticated layout and interesting pictures, emphasizing both the Association and its interaction with computing at large. This book would serve to describe the Association's central role in computing and provide a compelling identity for the Association.

The book would be researched and written by a professional historian of science, to ensure quality scholarship and an engaging narrative. The prints in the book would be located and assembled by a professional photographic archivist/editor; those not included in the book could be placed in the *Archive*. Connections with the history of computing in general would make the book more relevant and interesting to readers. (Note that ACM has published one coffee-table style book, in 1997, **Wizards and their Wonders**, which was nicely done.)

The second book, also written by the consulting historian, would be targeted to historians and to the current and future staff and volunteer leaders of ACM, who could turn to this book to get a sense of the context and prior actions of their corner of the organization. This book would be extensively cross-referenced to the source material and would go into depth on all important events and decisions by the Association. At present, this institutional knowledge is dispersed and incomplete. A coherent and comprehensive narrative would be very helpful in understanding where the organization has been, where the inflection points were, how the organization responded in the past to challenges and opportunities, and the vector on which the organization now finds itself.

As mentioned, ACM published a book in 1991 entitled **Turing Award Lectures: The First Twenty Years 1966–1985** by Robert L. Ashenhurst (editor). Jim Gray mentioned that he attempted to collect the subsequent lectures, in preparation for his own lecture in 2000. He said that he contacted most of the awardees directly, an activity that occupied an hour a day for a month. Two conclusions are obvious: Jim now has in hand most of these lectures, and the lectures are difficult for anyone else to locate. A book entitled **Turing Award Lectures: The Second Twenty Years 1986–2005** would now be fairly easy to produce, would be a useful supplement to the web site, and would be timely, coming out immediately after the 2005 lecture.

2.2 Historical Archive

The *ACM Historical Archive* would be an organized collection of source material, including

- digitized copies of memos proposing and discussing new ACM publications, SIGs, and Boards;
- interviews with past ACM Presidents, CEOs, Board Chairs, and other ACM leaders, as well as with ACM staff, many who have been with ACM for several decades;
- SIG-specific information, including interviews with past SIG chairs, charters for SIGs, reports submitted for periodic reviews,
- journal-specific information, including interviews with prior Editors-in-Chief (EiCs);
- strategic plans for boards;
- collected minutes for major committees and boards;
- information on affiliations with other organizations such as AAAI, CRA, IFIP, SIAM;
- videos promoting ACM that have been made over the years, as well as video and audio of past ACM events, such as the annual awards dinner;
- non-proprietary statistical information on Association and SIG membership, publication subscriptions, and other trend indicators; and
- proprietary information and documents (such as selective business records, and correspondence file of the President, CEO, and COO), in a separate protected area, with access on a permission basis for scholars and historians.

The consulting historian would provide valuable guidance to others collecting materials on *what* was potentially of interest and on *how* to locate these materials.

ACM should partner with a physical archive to store the actual physical documents (similarly to what the IEEE has done with Rutgers University). While digitized versions of the documents can be efficiently created and stored and viewed by scanning the documents into PDF, as ACM has done with its older journals and proceedings, it is important to also retain the physical version. The Charles Babbage Institute might be able to store these physical archives and professional archivists at this Institute might be willing to provide expertise drawn from an existing body of practice on choosing, indexing, and cataloging these materials.

The interviews themselves could be conducted by the historian as background for the book, or could be expanded to become source material themselves. The spectrum ranges from a few interviews to check facts and impressions through to an extensive oral history project, with full-scale interviews with many people.

Associated with this web site would an interactive time-line of ACM achievements over the last 50 years, with links to related textual material, pictures, audio, and video, and with contributions from the entire spectrum of Association activities. This could probably be implemented as an extension of the "ACM Timeline of Computing." (Hal Berghel, who originally proposed this timeline[24] with Tony Ralston, is supportive of such an extension.)

[24] `http://www1.acm.org/top/tl/`

2.3 Turing Award Site

The Turing Award was recently increased to $100,000, in part to heighten its visibility. The Turing Award site has a similar objective, coupled with a desire to create an historical record and to provide positive examples and role models of highly productive computer scientists.

An Editor assigned to each awardee would first work with the awardee to develop a complete list of materials, including all publications, but also including other artifacts, such as photographs, correspondence, and interviews, either past or done especially for this site. Permission would be obtained for each article to appear on this site, in concert with the awardee. SIGMOD's experience in gathering all the articles written by Jim Gray was that most publishers were willing to give permission for single articles, when the author requested that permission.

The University of Texas undertook a similar effort for Edgar Dijkstra. Their site[25] contains almost 10,000 pages of material as well as video. (Another example is a web site archiving Albert Einstein's scientific papers, personal letters and humanist essays[26], run by the Einstein Papers Project at the California Institute of Technology in Pasadena and the Hebrew University of Jerusalem.) Presumably most Turing Award winners would have produced much less volume; the point here is that publishers are cooperative.

Each Turing Award winner would be assigned to a SIG (for instance, SIGMOD would get Charles Bachman and the afore-mentioned Ted Codd and Jim Gray); that SIG would be responsible for collecting the material and working with ACM staff to obtain the permissions. When the possibility of this site was mentioned to Jim Gray, he responded that he thought other Turing awardees would be as enthusiastic as he was about such a project. As the Turing awardees are not evenly distributed among the SIGs, the SGB EC would need to work with chairs of relevant SIGs to ensure that each SIG had an appropriate number of Turing Award winners assigned to it. Additionally, the EiCs of relevant Journals and Transactions should also be involved.

It would be useful for the Turing Award web site to also be a mirror for the "Turing Archive" [27] and the "Turing Digital Archive" [28].

2.4 DVD-ROM

While all of this material would be freely available on the web, many people don't have fast internet connections. It would thus be useful to put this material, especially the multimedia content (photos, audio, video), on a DVD-ROM, thus permitting enhanced availability of this content.

3 Staffing, Budget and Funding

There are a variety of models for structuring this initiative. In the following one promising model that evolved from discussions with ACM volunteers and an historian is outlined.

3.1 Staffing

A professional historian would be hired as a consultant to oversee the effort. This consultant would interview the core people (probably past ACM Presidents and CEOs), coordinate the interviews of other people (past Board chairs, past SIG chairs, past EiCs, and others), coordinate the gathering of source material, writing the two books, and deciding on the structure of the Archive in cooperation with the volunteer Web editor.

[25] `http://www.cs.utexas.edu/users/EWD/`
[26] `http://www.alberteinstein.info`
[27] `http://www.cs.usfca.edu/www.AlanTuring.net/turing_archive/index.html`
[28] `http://www.turingarchive.org/`

An Advisory Board would be named to provide oversight and advice. This Board would consist mostly of ACM members along with a couple of very senior historians such as William Aspray (Indiana), Mike Mahoney (Princeton), Arthur Norberg (Charles Babbage Institute), Frederik Nebeker (IEEE History Center), or David Allison or Peggy Kidwell (National Museum of American History, Smithsonian).

A staff member at Headquarters would coordinate the paperwork, including obtaining copyright releases, locating material at ACM and arranging for all of the scanning, and handling financial record keeping for the project.

Volunteers, some drawn from the SIGs and Boards, would perform many of the interviews and would work with the Turing awardees to identify materials to obtain for the Turing Award web site. One volunteer would also be needed to edit the second collected Turing Award lectures; another would serve as Editor of the *Historical Archive*.

Freelancers would be hired for auxiliary tasks such as transcription of interviews.

3.2 Budget

Based on past efforts of a similar magnitude, a qualified historian could be hired as a consultant for a two- to three-year effort to perform the tasks listed above at $200K plus $40K expenses (this is a maximum, generous estimate).

The interviews themselves, of every living President and CEO and other major players, perhaps 40 in all, would each cost about $500–$1K in travel expenses and transcription costs, or perhaps $50K for all. (This is an intermediate position on the spectrum of interviews mentioned in Section 2.2.)

Scanning the material for the Archive would cost perhaps $16K for 20,000 pages. If each Turing awardee has 4,000 pages of material, that would be about $120K for scanning. Designing the web site would cost $10K; the staff member would cost perhaps $30K. The DVD would cost about $5K for 1000 copies.

(Producing 1000 copies of the coffee-table book perhaps $60K and the more scholarly book $25K; these costs would be covered by revenue from sales of these books and transfers from other line items for promotional use of the books, such as gifts to volunteers. The scholarly book could also be printed on demand[29].)

Thus, the total cost of this initiative is very roughly $471K.

3.3 Funding

One possibility for funding would be a matching grant from the Alfred P. Sloan Foundation[30], on how to use the web to better preserve the history of the Association. If the SIGs contributed the full amount for the Turing Award web site ($125K) and ACM contributed $75K, and if Sloan matched this at less than 1.5–1 with $275K, the project would be fully funded.

[29] `http://www.1stbooks.com/`

[30] `http://www.sloan.org/main.shtml`

4 Next Steps

A comprehensive, coordinated effort is advocated for this initiative, involving both volunteer leaders and ACM staff.

ACM Council The overall direction for such an Association-wide effort would need to come from the ACM Executive Committee and Council. If this initiative was thought to be appropriate for ACM, the Council would appropriate funds to commission the book and to assemble the *Archive*. The ACM EC, working closely with the ACM CEO, would hire the historian and photo editor and prescribe their detailed role. A variety of historians to possibly serve in this role have been identified. ACM Council would also name the Advisory Board.

ACM Staff Many, if not most, of the archival documents are located somewhere in the files at ACM headquarters. ACM staff time would be needed to perform these searches and to collect the material for digitization. The staff of the relevant divisions (publications, boards, SIGs) would also collect relevant statistics and other summative information, to capture quantitatively the arc of ACM's history over the years. The pubs staff would set up a procedure for obtaining permission for the many individual papers and photographs and other material to be included in the Turing web pages. Staff throughout the organization could provide valuable information to the historian and photo editor; time should be set aside for them to be interviewed. Finally, information systems staff would be needed to set up and maintain the *Archive*.

SIG Governing Board The SGB would organize and regularize the efforts of the individual SIGs to document their history, as well as to organize the SIG portion of the *Archive*. The SGB would work with the Pubs Board to ensure that all the Turing awardees were accounted for.

Individual SIGs Chairs of individual SIGs could themselves or though delegation to someone else assemble the history and ancillary material of their SIG and their conference(s), in cooperation with the SIG staff. Some of this material may be published in the SIG newsletter; all of it would be that SIG's contribution to the *Archive*. Interviews with prior chairs of the SIG and prior chairs of the conference could provide valuable historical material. The SIG would also contribute relevant events to the ACM time-line, and would develop the Turing Award site for the awardee(s) in its area. One option would be for the individual SIGs to fund the digitization of the material in the Turing Award web site, with the SGB Project Fund helping out those SIGs that didn't have sufficient resources. (Alternatively, the SGB Project Fund or a portion of the transfer of DL revenue to the SIGs could cover the entire Turing Award website.)

ACM Publications Board This Board would be responsible for appointing an Editor of the *ACM Historical Archive* (both the web site and the DVD-ROM publication) and an Editor for the Turing lecture book. The Pubs Board would also be responsible for coordinating with the EiCs of the publications to organize the publication portion of the *Archive*.

ACM Editors-in-Chief Each EiC could work with the Pubs Board to solicit recollections from past EiC's, and could prepare a history of their journal, for publication in the journal (as has been done for *JACM* and, many years ago, for *TODS*, as mentioned above), or perhaps in the newsletter of an associated SIG. EiCs and their Associate Editors would also work closely with the relevant SIGs in populating the Turing Award web site.

Other ACM Boards Each ACM Board chair would coordinate the collection and assembly of the history of his or her board, including interviews or invited reminiscences of previous leaders of that board. These would be published in an appropriate venue, such as *CACM*, the book, and/or the *Archive*.

5 Proposed Milestones

The first step would be the ACM and SGB Executive Committees to have initial discussions to formally place this proposal on the agendas of the ACM Council and SIG Governing Board summer and fall 2003 meetings, to determine the desirability and scope of this project.

If it were decided to move forward, ACM and SGB could allocate the initial funding. The historian would need to be located; his or her input would be critical for the remaining collection tasks. The ACM staff could then start gathering material and working out a publication permission process.

With this funding allocated, proposals could then be prepared for matching funds. Additionally, the SIG chairs, Board chairs, and EiCs could start locating volunteers. This preparatory and organizational activity would require the rest of calendar 2003.

It is critical to move quickly with initial interviews of those in poor health. Less pressing interviews and other activities could proceed as funding is obtained.

Assuming that matching funds were obtained, the entire year of calendar 2004 would be occupied by many parallel efforts of gathering historical artifacts and of interviews and writing of retrospectives and reminiscences, with material forwarded to the *Archive* and Turing Award sites when available. The historian and photo editor would work on the books during this time.

The year 2005 would see the announcement (at the 2005 ACM Awards Dinner) and availability of the *ACM Historical Archive* and Turing Award site and the publication and distribution of the three books and the DVD.