Response to Galler, Pinkerton, Arden Letter

Key Words and Phrases: proprietary, software protection, copy-right, patent, trademark
CR Categories: 2.2, 2.3

EDITOR:

This is in response to the Galler, Pinkerton, and Arden letter [Comm. ACM 11, 12 (Dec. 1968), 802] concerning proprietary software packages. I agree with Finerman's basic comment that the original letter raises two questions: (1) the free and open exchange of software packages; and (2) the availability of software descriptions referenced in professional publications.

The Sun Oil Company has sold, bought, and traded such packages and has received and given some away free. A software package created by Sun Oil Company employees as part of their assigned duties represents a Sun Oil Company asset just as much as does an invention, or a design, or a trade secret, or any form of proprietary information. The decision as to whether to use this package only within Sun, or offer it for sale, or give it away to the public is a management decision that must be made in line with the company's responsibilities to its employees, stockholders, customers, and the public. It is the kind of decision that our company management makes frequently in the case of other proprietary information and the same criteria are applied.

In broad terms, the proprietary information that we think might harm our competitive position if released is kept within the company. The proprietary information that we think would yield more in sale revenue than the harm we would suffer because of its use by others we offer for sale with appropriate secrecy agreements. The proprietary information whose wide use would be in the best interest of the public at large, we release for public use. We treat our proprietary software packages in this way, and we would expect other private, profit-oriented organizations to do the same.

We consider proprietary software packages to be articles of commerce just as any other invention, design, piece of proprietary information, or manufactured item is. We find that software packages can be evaluated prior to sale, and we do this as a matter of course. We find that where the construction of the package is important to our use, we can arrange to examine this if we agree to suitable restrictions as to disclosure. We consider this to be hardly any different from our requirement that we evaluate the performance and general design of any machine or computer that we plan to rent or buy.

With regard to the second point, the availability of software descriptions referenced in professional publications, I find myself in both agreement and limited disagreement with Finerman. I agree that a paper submitted for professional publication should be judged solely on its content and that implementation details of software packages are not automatically necessary.

I disagree with the implicit assumption of Galler, Pinkerton, and Arden, as well as Finerman, that the description of a commercial article is generally to be classed as sales literature and that sales literature is by nature not appropriate for professional publication. Although this assumption is rather clearly made by mathematical journals, it can be seen to be less effective in the more practical of the physics journals and almost vanishes in the publications of the engineering societies, which do not hesitate to accept papers on specific, proprietary apparatus and devices. The ACM is at least in part an engineering society, and the creation of software is more like engineering design than like the discovery of scientific principles or the proving of mathematical theorems. The criteria to be applied by ACM publications should recognize this connection of ACM with engineering principles and standards and not automatically exclude a description of a commercial article.

The professional publication of the description of a specific commercial device or software package conveys useful information to the reader and subjects the description to a critical review that other sales literature never receives. This review is useful to the prospective purchaser and user as well as to the creator of the device. Both the information distribution and the review serve the computer community and advance the art.

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"ACM Has a Tremendous Story To Tell"

EDITOR:

Hurray for George Samson! It is about time somebody in the ACM decided that the public needs to be let in on "the secret world of computers." ("ACM Has a Tremendous Story to Tell" [Comm. ACM 12, 2(Feb. 1969), 122]). As almost anyone who is acquainted with any part of the general news media will know, correct information on the capabilities of computers is sorely lacking, although incorrect information proliferates. Ever since the establishment of a sizeable computer industry we have been hanging the "members only" sign (or is it perhaps "high priests only"?) on the computer room door. "You can only see what goes in and what comes out, not what is inside." If we, the computer professionals, do not start explaining these big Black Boxes (or Blue, or Red, as the case may be), through the ACM and other means, then someone is going to start capitalizing on the general public misinformation (if he hasn't already). Let us not forget it is our duty to educate others as well as ourselves. Let me be counted as one in favor of Mr. Samson's effort, and as one who will be glad to help.

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Comment on a Paper by Ku and Adler

Key Words and Phrases: resultant algorithms, polynomial resultants, g.c.d. algorithms, reduced p.r.s. algorithm, Bezout determinant, Laplace determinant expansion, analysis of algorithms
CR Categories: 5.0

EDITOR:

I have read with much interest the paper "Computing Polynomial Resultants: Bezout's Determinant vs. Collins' Reduced

P.R.S. Algorithm" by S. Y. Ku and R. J. Adler [*Comm. ACM 12*,1 (Jan. 1969), 23–30], and I certainly wish to be among those congratulating the authors on the excellence of their paper. However, there is one aspect of the paper which requires criticism. Throughout Section 4, the authors present much empirical evidence and many arguments to justify their conclusions that for polynomials in two or more variables the Bezout determinant method is faster. The empirical evidence presented is incontrovertible; but the arguments are incomplete, and the conclusions are false, as I will show. The truth is that for any fixed number, k, of variables the reduced p.r.s. algorithm is faster for sufficiently large degree, n. (Note that the empirical data are all for $n \leq 5$.)

The proof of this assertion is simple. The authors employ a nonrecursive version of Laplace's rule for expansion of Bezout's determinant, which avoids redundant computation of minors. However, it is easy to verify that the irredundant version still requires at least $\sum_{k=2}^{n} k\binom{n}{k} = n(2^{n-1} - 1)$ multiplications for a determinant of order n. In fact, $\binom{n}{k}$ distinct minors of order k must be computed, each requiring k multiplications, for $2 \leq k \leq n$. Thus the computing time for the Ku-Adler method is an exponential function of n. In contrast, the computing time for the reduced p.r.s. algorithm is known to be a polynomial function of n for any fixed k—even if exact unlimited-precision integer arithmetic is used. For $k = 1$, this has been proved rigorously in G. E. Collins, "Computing Time Analyses for Some Arithmetic and Algebraic Algorithms," to be published soon in *Proceedings of the IBM Summer Institute on Symbolic Mathematics by Computer, 1968* and available now as a technical report. The analysis given there extends easily by induction to arbitrary k. For example, computing times for the reduced p.r.s. resultant algorithm are $O(n^4)$ and $O(n^8)$ for $k = 1$ and 2 respectively. Much faster algorithms based on modular arithmetic are currently being developed, tested, and analyzed.

I think this demonstrates again that a simple analysis is often more revealing than a ream of empirical data (although both are important).

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Move ACM 1971 Conference from Chicago?

EDITOR:

With regard to the letter of Robert R. Fenichel [*Comm. ACM 12*, 2 (Feb. 1969), 84], moving the location of the 1971 ACM Conference from Chicago could only be construed as a political action. According to the purposes of the Association as printed on the masthead, taking a political position could be justified only if it were necessary to protect the free exchange of information in computer science; this is not the case. Indeed, because of the central location of the city of Chicago, holding a conference there should reduce travel expenses, and thus facilitate free exchange of knowledge.

If we are told to shun Chicago in 1971, shall we be told for whom to vote in the national elections of 1972? Shall *Communications* only accept papers from those authors whose politics agree with some standard, established by Fenichel or by majority decision? Shall the truth of mathematical theorems be determined by vote?

Lawyers are fond of saying, "Beware the entering wedge." I think that this is one precedent we do not want set.

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On Obtaining Technical Information from the Federal Government

EDITOR:

COSATI, the Committee on Scientific and Technical Information of the Federal Council on Science and Technology, has established a Task Force to review the Government's technical information dissemination policies and practices, assess their adequacy, and recommend improvements as needed. To date the Task Force has interviewed many officials in the Government sector of the scientific information community.

However, other members of the information community and the scientists and engineers of the nation have not been heard from. What obstacles do they encounter in obtaining access to the Government's scientific and technical information? How do they view the present dissemination systems? Are the results of the Government's vast R&D programs actually available to and utilized by the private sector of the economy? What improvements are needed and what recommendations should be made? What specific aspects of Government dissemination programs or systems do you find satisfactory, commendable, or would you like to see expanded? These are but a few of the questions to which the Task Force is directing its attention.

You are invited to share your personal views with the Task Force. Please identify yourself as: scientist, engineer, librarian, other information specialist, manager, or other (specify). Anonymous comments cannot be considered; however, the identity of the contributors will not be disclosed without their permission. All replies should be sent to the undersigned. If you wish to obtain a brief summary of the responses obtained, mention this fact when forwarding comments on your experiences, problems and recommendations.

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On Selecting the Sites for IFIP Congresses

EDITOR:

In his Letter to the Editor [*Comm. ACM 11*, 12 (Dec. 1968), 801] Saul Rosen complains about Edinburgh and Ljubljana as sites of IFIP Congresses. I can assure Mr. Rosen that his arguments are known to IFIP officers. These arguments are some of many, pro and contra. I myself, for instance, have not only seen "The Yellow Rolls Royce," I have been repeatedly in Ljubljana. Mr. Rosen is right, there will be certain hotel problems for Rolls Royce owners and for others.

It seems, however, that Mr. Rosen does not realize that there are considerable differences between the organization of a U.S. national conference (even a national conference in a smaller country) and the organization of an international congress. The variation of problems is considerably greater, and the experience gained from one congress is not necessarily of help for the next one. IFIP does not compete with American national conferences, otherwise we would have to hold all our congresses and conferences in U.S. and Canadian cities.

The proper wording is that IFIP has accepted the Yugoslavian offer to hold IFIP Congress 71 in Ljubljana, and we accepted the British offer for 1968 in Edinburgh. Usually IFIP does not have dozens of offers, and we cannot select a country and city and make them organize a congress. Years of preparation may be necessary to get the offer ready at

the national level and few national technical societies have the staff, organization or financial resources possessed by AFIPS.

It was unfortunate that the lecturing halls in Edinburgh were too small for a participation of which the organizing committee in the United Kingdom obviously did not dare to dream. As far as I can judge, this will not happen in Ljubljana; some sense of adjustment may be necessary to accommodation—but this same fact will offer a chance for other participants.

There were Yugoslavian delegates in Edinburgh and there are obvious possibilities to check such a fact before writing a letter to a journal.

I do not know Mr. Rosen's definition of "some reasonable level of computer activity"; only a few countries can stand comparison with the United States—and there we have had a congress. We face reproaches that we have had too many congresses and conferences in the highly developed countries. I trust that further consideration will lead Mr. Rosen to a better appreciation of the decision on IFIP Congress 71; he may find several more reasons that Ljubljana was not so bad a choice. I trust that most American colleagues do not share the opinion that IFIP intends or admits minimization of (American) participation. And European colleagues like to attend American national conferences even though the excellent (and sometimes almost excellent) facilities might mean a bigger burden on their finances than they like. International cooperation requires compromising.

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Restore Professional Atmosphere at ACM Meetings

EDITOR:

I am prompted to respond to the President's letter "Let's Face It" in the April issue. I do not take issue with the financial aspects, although I would suspect we will soon outrun the other professional societies in the area of dues. I also do not take issue with the "reduction of benefits" as I have always felt *Computing Reviews* was not useful to me. I agree fully with the necessity for drastic action.

However, where I do want to make a stand is in the matter of recruiting new members. I have been actively pursuing this, in the past, and have been somewhat successful. Recently I moved to the L.A. area, and promptly joined the Los Angeles Chapter, expecting much of a group situated in one of the largest population areas in the world. I have been greatly disappointed both in the attendance at the meetings and in the meetings themselves.

My disappointment stems from the subject matter and from the speakers. Three of the last meetings which I attended had to do with social conscience and community aspects. Two of these were on the same subject "Operation Bootstrap," which is an L.A. area self-help program for black people. Our sensibilities were assaulted with language worse than the four-letter variety, much of it heard for the first time. One meeting started out with a film of a toy collection and, I'm afraid, never got much above that level. Another meeting had a guest lecturer who was speaking on the high cost of programming, but which was immediately directed by the lecturer into becoming a "happening." It sure did! There were discussions going on all over the room, with no one able to hear anyone else, and people trying to top each other's stories about how many bit-manipulation routines had been written to do the same thing.

My point is this. I belong to the ACM to advance and enhance my knowledge of my professional field. I encourage others to belong for the same reasons. At the meetings described above, I had taken people as guests to persuade them to become members. Three guesses as to what their answer was. I also have dropped my membership in the chapter (although I will maintain the national). If I want to hear social conscience lectures, I can get them many places besides the "professional society" meeting. If I want to get into arguments about the methods of coding, I can get this at work or during the cocktail hour. If I go to an ACM meeting, I expect worthwhile subjects in a professional atmosphere. Unless and until I can expect this at each meeting, I feel that I can no longer recruit new members.

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A Graduated Dues Structure for ACM

EDITOR:

The serious financial situation in which ACM finds itself probably will lead to a general raise in members' dues. However, a substantial increase undoubtedly will tend to reduce the influx of new members from those groups most essential to ACM's future: students and new computer professionals.

Thus this is an excellent time to reexamine ACM's present dues structure ($25.00 for full members; $12.50 for student members). I believe that the alternative of a sliding scale based on income has considerable merit (other professional organizations, such as the American Library Association, have such a basis).

A significant increase in ACM's over-all revenue, with a substantial reduction in the obligation of students and new professionals can be attained by dues of approximately 0.3 percent of a member's total annual income. A step-wise dues structure based on this rate would look as follows:

Annual Income	Dues	Annual Income	Dues
$ 0- 2,999	$ 5.00	$ 10,000-10,999	$30.00
3,000- 4,999	10.00	—	—
5,000- 5,999	15.00	15,000-15,999	45.00
6,000- 6,999	18.00	—	—
—	—	20,000-20,999	60.00
		—	—

With such a scale, if the median income of the present 31,000 ACM members (including students) was as low as $10,000, the ACM could realize considerably more than $900,000 in individual dues per year compared with the present $600,000 from regular members plus $87,500 from student members. Because the incomes of a large group of individuals usually follow the Lorenz distribution (which is highly skewed to the right) the impact of incomes higher than the median is much greater than if the incomes were distributed normally. This should put ACM back in the black, and provide an essential cushion for unforeseen contingencies.

There is only one catch to this proposal—it can only work if our members want it to work. This can best be accomplished by submitting such a dues proposal to the vote of all present members.

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