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A Study of Publication Delays

Peter J. Denning

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Introduction

Many authors complain that editing, refereeing, and publication delays in professional journals are "excessive". Readers complain that published materials are not "timely". To see whether there is any substance to these complaints, I undertook my own study of publications delays for all papers published in two ACM journals and two IEEE journals during the period June 1975 through December 1978. These were the journals:

CACM -- Communications of the ACM

JACM -- Journal of the ACM

TC -- IEEE Transactions on Computers

TSE -- IEEE Transactions on Software Engineering

This report summarizes the results of my study. I conclude that TSE has nearly the minimum delays one can reasonably expect of a refereed journal (14 months from submission to publication) and that the other journals are slower (about 20 months) but otherwise nearly the same. I have no way of knowing whether these delays are not "timely", but I do believe editing delays are longer than necessary.

Method

Almost all papers are published with two dates: received and revised. The first indicates the month and year in which the editor first received the paper for consideration. This date usually approximates the time at which the authors completed the research project -- but not always because authors may have tarried or the paper may have been rejected by another journal. The second date indicates the month and year at which the last revision was received by the editor. The significance of this date is less clear: depending on the editor, it may mean the date of final acceptance or the date at which the final round of refereeing began.

I used these two dates plus the actual date of publication to associate two quantities with each paper:

E -- Total editing time, the difference (in months) between the received and revised dates, and

P -- Total printing time, the difference (in months) between the revised and publication dates.

Note that E-time includes all delays incurred by the referees, the editor, the authors (in revisions), and the postal service. The P-time includes queueing at the printing office, copyediting, galley-checking, printing, and distribution; as noted above, it may also include the final round of refereeing for some papers. The total publications delay for each paper is simply the sum E+P.

Table 1 shows the number of papers for which I collected these data during the observation period (6-75 to 12-78). These data do not include a small number of papers whose received or revised dates

Journal	No. Papers Analyzed
CACM	233
JACM	188
TC	264
TSE	109

TABLE 1. Numbers of Data Points by journal.

	Editing E	Printing P	Publication E+P
TSE	7.3	6.6	13.9
JACM	11.2	9.2	20.4
TC	11.2	9.8	21.0
CACM	10.2	12.0	22.2

(months)

TABLE 2. Average editing and printing times by journal for the observation period.

were not given. They also do not include papers published in special issues or special sections because these papers are not handled in the same way as the main stream. Therefore the number of papers published in each journal is somewhat larger than the numbers shown in Table 1.

I collected histograms for each variable in each journal over all the papers. For example the histogram H(E,x) specifies the fraction of all papers which had E-time not larger than x months.

I also computed the average value of E and P for each quarter of each year in each journal. For example $\bar{P}(t)$ represents the mean printing time of the papers published in the given journal during the quarter ending at time t. Note that $\bar{P}(t)$ is not necessarily the so-called "printing backlog" at the headquarters office at time t; $\bar{P}(t)$ refers to papers already published, whereas "backlog" refers to papers waiting to be published.

Results

Table 2 summarizes the mean editing and printing times by journal for all papers in the period of observation. TSE has the best record, CACM the worst. However, the CACM's main problem has been excessive P-time; as shown later, this time was down to 8 months at the end of 1978, which suggests that the total publications delay E+P was about 18 months at that time.

Table 3 summarizes the mean editing time by department of the CACM. Although the mean over all departments is 10.2 months, there are significant differences among departments. The table also shows the coefficient of variation, CV, which is the ratio of the standard deviation of the data to the mean. (Smaller CVs imply less variation.)

Figure 1 displays the histogram of editing time for the four journals. This diagram refines Table 2; it shows that TSE has been uniformly and significantly more responsive than the other journals. Table 4 summarizes the data of Figure 1, showing for each journal the number of months required to complete the editing of given proportions of all papers. This table again shows that TSE has been the most responsive; CACM, JACM, and TC were nearly the same until 50% of the papers have been processed; JACM and TC have had the highest percentages of papers that experienced very long delays.

Table 5 summarizes the histogram of P-times in a form similar to Table 4. Over the observation period, CACM had the longest printing times.

The graph of mean editing time by quarter, $\bar{E}(t)$, revealed no interesting pattern. However, the graph of mean printing time, $\bar{P}(t)$, is more interesting; see Figure 2. It reveals that TSE had consistently the shortest delay while CACM had the longest. During most of 1977, just after ACM's period of greatest austerity, CACM had a mean printing delay of just under 15 months; by the end of 1977, the decision of the ACM Publications Board to apply extra resources to work off the backlog began to show results. By the end of 1978, the printing delay was approximately 8 months -- slightly better than JACM.

Department	No. Papers	E	CV
Programming Lang*	14	5.9	.47
Management Appl	19	8.3	.43
Programming Techn	63	9.4	.65
Programming Lang**	23	10.0	.53
Computer Systems	27	12.7	.44
Operating Systems	19	13.4	.34

*Editor A, to 6/77

**Editor B, from 7/77

TABLE 3. Mean and coefficient of variation for editing time, for selected departments of the CACM.

Percentiles of E histogram, H(E,x)	TSE	CACM	JACM	TC	
30%	3	6	6	6	
50	5	9	9	9	
70	8	11	13	13	Months (x) to attain E percentile
90	15	18	20	22	
95	18	21	24	25	

TABLE 4. Summary of editing time histogram.

Percentiles of P histogram, H(P,x)	TSE	JACM	TC	CACM	
30%	5	7	7	9	
50	6	9	9	11	
70	7	10	11	13	Months (x) to attain P percentile
90	10	11	13	16	
95	11	12	15	18	

TABLE 5. Summary of printing time histogram.

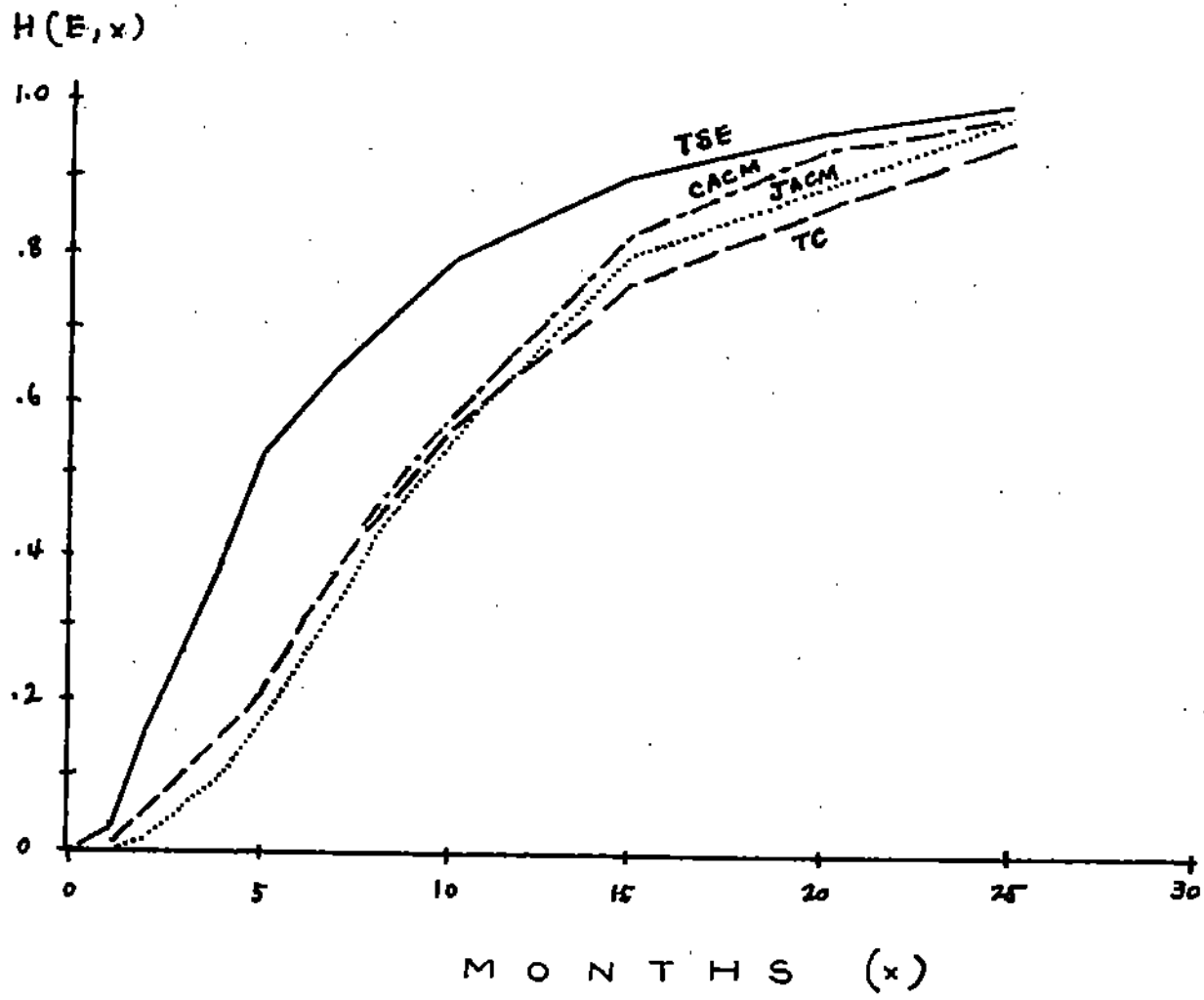

FIGURE 1. Editing time histogram for the four journals.

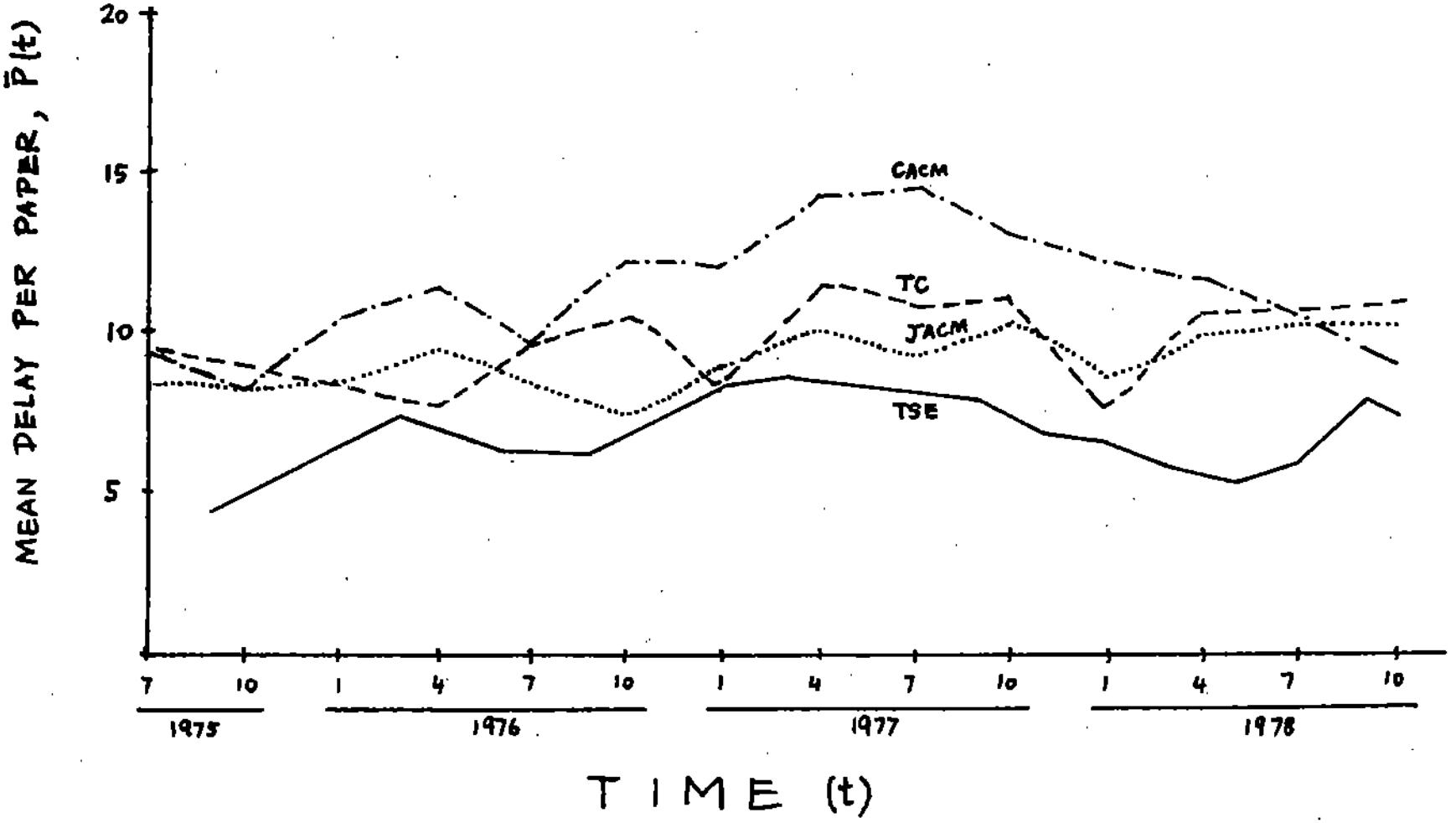

FIGURE 2. Mean printing time by quarters for the four journals.

Conclusion

One of my objectives was to illuminate whether publication is "timely". I think that the TSE's publication delay (14 months) can be taken as a practical minimum -- it is very difficult to obtain the typical two rounds of refereeing and revision in less than 8 months and to maintain a smooth publication schedule with a printing backlog of less than 6 months.* Apparently many authors believe that the prestige of the refereed journals justifies the wait. The only practical way to reduce the publication time is to abandon the refereeing system, as in the SCIENTIFIC AMERICAN or the IEEE COMPUTER. The editor is not required to use the advice of referees and professional editors are allowed to revise papers heavily: the publication time can be as little as 4 months. However, the refereeing process is a much more compelling certification of a paper's originality and technical accuracy.

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*The ACM Transactions on Programming Languages and Systems (TOPLAS), which begins publishing in July 1979, will replace the Programming Languages and Programming Techniques departments of the CACM. (Tables 1 and 3 show that 100 of 233 papers, or 43%, were in these departments in the observation period.) If the editors maintain their 9-month editing time and if the printing time is kept within 6 months, this journal should also be close to the practical minimum for its initial period.

My second objective was to illuminate whether editing times have been excessive. There is a correlation between editing time and the age of the journal. The CACM, JACM, and TC were started before 1960; the TSE was started in 1975. One can argue that the older journals, whose mean editing times are nearly the same (11 months), set the norm of the field. On the other hand, TSE has maintained a mean editing time near 8 months since its inception; there is no sign that editing time is increasing or that the TSE's quality is lower. Thus it can also be argued that the editing time of the older journals is excessive relative to the TSE's.

It is tempting to conclude that age has dulled the older journals. But things are not so simple. Owing to heavy demand, the older journals have adopted a decentralized editorial system -- each department editor has in effect full authority to accept or reject papers. In contrast, TSE has a centralized editorial system -- the editor-in-chief retains most of the control. It is much easier to manage for rapid responses in a centralized system than in a decentralized one. In the COMPUTING SURVEYS, which also uses a centralized editorial system, the mean editing time for accepted papers is also around 8 months. The shorter editing times may be characteristic of a centralized editing system. The older journals are too large to be reorganized under a central editing authority.

Nonetheless a few reforms could help reduce editing time even in a decentralized operation. I recommend some of the policies of the COMPUTING SURVEYS. It is policy that the editor sends a paper to the referees within three days after receiving it, and reports to the author within three days after the last referee has responded.

It is policy to maintain personal relations with each referee; for example, all correspondence is by individually typed letter (no forms or postcards), all reports are acknowledged on receipt, and all referees receive a copy of the editor's letter and the other referee reports along with the author. It is policy to send reminders automatically to referees at two-week intervals beginning after four weeks; with these gentle reminders 95% of all referees report within 8 weeks. It is policy to choose each referee very carefully from among those known to be keenly interested in the subject of a given paper; this has kept the rate of refusals to under 5%. Such policies could be adopted as a standard throughout all departments of decentralized journals.

Some editors argue that seeking rapid response tends to irk referees and to increase the likelihood of careless reports. However, our experience in COMPUTING SURVEYS is the opposite: the referees appreciate the personalized interaction with the editor and they render better reports.

A final reform of the editing system would be the regular reporting of data, such as in this report, to all department editors. Editors are a proud breed. On discovering that his department is significantly less responsive than the average, an editor may undertake his own improvements.