QUALITY CONTROL IN THE E-JOURNAL ENVIRONMENT

THE COMMERCIAL PUBLISHER: TALES FROM THE EDITORIAL BACK OFFICE

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This paper describes the concept of quality control in the context of the electronic journal. It considers implications for submission of articles, peer reviewing and copy editing, and concludes that quality control is arguably even more important in the e-journal environment.

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First, the disclaimer: the subtitle of this paper is 'tales from the editorial back office' - this is a warning that I will not cite all of my sources. Therefore some of the content of this paper is unverifiable. Is there a comment here about quality control?

Quality Control

Who needs it?
What is it?
Is it different in the e-journal environment?

This table is an attempt to describe concisely who uses learned journals and why. The terms used to describe groups of users should be taken in the widest possible context.

Researchers	news of competitive/related research communication and recording of results registration of first claim gaining feedback from peers credibility/visibility/tenure
Editors/ Editorial Boards	establishment of new research areas provision of focus/forum for a particular research area
Teachers/students/ others	study/information gathering

Table 1. Who uses journals and why

Regardless of whether journal users inhabit the ivory towers of academia or the frenetic corridors of industry, I would suggest that they are all engaged in serious pursuits upon which depend the livelihoods (and in some cases the lives) of themselves and others.

They therefore need some assurance that the information on which they depend, and will spend time trying to replicate or validate, has been researched and presented in a responsible way - particularly if they are paying for it.

Some research carried out by a group in the Netherlands (and supported by a large journal publisher) suggested that the following are valued most by those using journals for scientific research[1]:

- reliability
- relevance
- accessibility
- usability
- timeliness

I would argue that these points provide an accurate description of the aims of quality control. A listing from the publisher point of view can be found in *Promises and Pitfalls - An AAP/PSP Briefing Paper on INTERNET Publishing*.[2]

How are these aims achieved in traditional print publishing?

Perhaps one of the most basic quality-controls is that of the law. The act of publishing carries certain legal obligations in most countries in the world. Most responsible publishing operations employ legal advisors, and train their staff to identify potential infringements, so that authors and editors can be advised sensibly. No, I am not going to regale you with a string of lurid tales of illegal deeds - though I think I may be the only publisher to have received a message from a journal editor that he had been threatened at gunpoint to accept a paper. Thankfully, the local police force stepped in. Then there was the case of the reviewer who was the spurned lover of the author.... but I will save that one for another day and do a quick walk-through of the submission, peer review and copyediting process.

The first stage in the publication process is submission of a paper. The editorial office may be on a university campus and, as university budgets get ever tighter, it may be funded by the publisher who, in the case of a large and prestigious journal, may well pay for the full-time services of an editorial assistant, as well as running costs.. The editorial office will read the paper and will offer advice to the author on how best to present it for the peer review process. While most journals issue written guidelines for authors, experience from at least one publisher indicates that a mere 30% of authors adhere to such guidelines (we will come back to this point later). Authors may be advised to submit to an alternative journal, considered more suitable for their paper, or they may be advised to do some rewriting before submission. So, the first quality check comes with initial submission.

Any paper passing this initial filtering process is then usually submitted for peer review. The editorial office will approach two or more experts in the field to ask them to check the relevance, scientific accuracy, and contribution of the paper to the field of research which the journal represents.

The peer review process is arguably the most valuable of the quality control processes. It is an unwritten rule that anyone having a paper accepted for a journal will, in return, review two or three future papers. It is the responsibility of the journal editor, editorial board and publisher to ensure that suitably qualified and responsible reviewers are chosen. Guidelines given to reviewers can vary and the process can be subjective - nonetheless this process provides valuable feedback to the author and a valuable service to the reader. Disputes are not unknown, delays are commonplace. This is the part of the publishing process which is the most time-consuming and difficult to achieve. It is largely a voluntary activity; it is a task reviewers take seriously (reputations and careers are at stake) and thus it takes a large amount of time and effort (between 2 - 6 months on average - and if a paper needs to be submitted for a second review after rewriting then the timescale becomes even longer). In publications where time is particularly critical the process is closely controlled by the publisher and reviewers may receive payment to ensure response within a specified time.

The copyediting process represents the final quality check during which the publisher's staff will check that references are complete (i.e. that they can be used to retrieve the relevant paper); that the illustrations will reproduce to show what the author is aiming to demonstrate; that

there is no obvious legal infringement such as libel or trademark violation; that the reader can navigate around the paper, i.e. that the labelling is consisten, and that the paper can be understood without any ambiguity (sometimes just as necessary for native as for non-native English speakers). The typeset proofs are, more often than not, reviewed by the author, the copyeditor and, sometimes, the journal editor too, before the final printing stage.

Here is one (admittedly rather extreme) example of the sort of issues which can arise during peer review and copyediting. This example was provided by the staff at a very prestigious large circulation publication. In the course of checking citations for a paper submitted by a large research group it was noted that the references did not seem complete - research results published by a second research group at a different institution had been excluded. It took a week of concentrated effort from a member of the publishing house staff to persuade the high-powered PR person at the submitting institute that despite being in competition for funding with this second group they could not, and should not, exclude all references to their work.

There is of course the final, final, check whereby the typesetter and printer check the accuracy of what they have produced and this is viewed and checked once again by the publisher.

I would suggest that all the processes I have described are still relevant and necessary in the e-journal environment, wherein there is a chance that automation of some checking processes might be possible. There are also a number of new challenges to the quality control process and I hope to suggest a few of these here.

Can automation save time and cut down the problem of checking for errors introduced during the typesetting process?

In some subject areas time from submission, to publication, to receipt of feedback from readers of the published paper can be 18 months or more. By this time many researchers may have moved on to a different area of interest. Can the electronic environment provide tools and techniques to cut down the wait for feedback from reviewers and fellow researchers?

One such might be the provision of structured formats for delivery, i.e. encouraging authors to submit in a highly structured way so that consistency with format and standards can be checked automatically. The Ginsparg physics preprint servers use this technique to help automate the publication process. Last year at the ICSU Press/UNESCO conference on electronic publishing in science, the editor of a structural science journal described how automated checking is improving timescales prior to peer review[3]. Here is a brief extract from his description:

> "Authors are encouraged to submit papers via e-mail using the CIF standard (Crystallographic Information File). The file contents are validated, special software is used to check the integrity and self-consistency of the data, and the text items are converted into printed proof of the paper. The proof includes formatted tables of data which are extracted directly from the CIF entries. Manual intervention only occurs if an error is detected. If too many problems are encountered the paper is returned immediately to the author. All of this happens before the paper is forwarded to the co-editor for scientific review."

He reports that this procedure saves considerable time and cost otherwise spent in sorting out trivial formatting errors. The improvement in publication time encourages compliance from authors. The journal publishes in print with the CIF data available via WWW.

The editor of the totally electronic *Glacial Geology and Geomorphology (GGG)* journal has discovered that attempts to encourage structured submissions, or even to limit submissions to standard text-processing formats, can be an uphill struggle. This is a subject area in which no data interchange standards (such as CIF data) have been established. This is also a new journal where potential authors do not have the incentive of established impact factors to drive them to compliance with submission requirements.

Timesavings have been achieved on GGG (and many print journals) by carrying out all

correspondence with reviewers by e-mail and by delivering papers for review as e-mail attachments or as a download from a secure ftp site. Experiments have been carried out with revision tools in textprocessing packages such as MicroSoft Word to enable reviewers to annotate a paper, and copyeditors to mark up corrections. However, after annotation by reviewers the paper typically looks such a mess that it can be totally incomprehensible to the poor editor or author who has to make sense of the comments. Currently, the journal is working instead on providing a secure ftp area for each paper in which reviewers can lodge their comments for viewing by the author and a moderating editor. It is too early yet to judge the success of this technique; similar techniques also been tested in the review process for conference proceedings in a number of subject areas.

At the moment, while there are undoubtedly problems in some subject areas in identifying tools which will be usable by reviewers and which will suit the subject matter, it does seem that the principal sticking point is a behavioural one. Many reviewers (copyeditors, and indeed readers) currently prefer to print out anything requiring serious study, and to make marks on the paper version.

I should briefly mention one or two new challenges to the quality control process posed by the electronic environment.

Here is a reference from a draft paper which cites three sources for a publication:

> [Odlyzko1] A.M. Odlyzko, Tragic loss or good riddance? The impending demise of traditional scholarly journals, Intern. J. Human-Computer Studies (formerly Intern. J. Man-Machine Studies) 42 (1995), 71-122. Also in the electronic J. Univ. Comp. Sci., pilot issue, 1994 (http://hyperg.iicm.tu-graz.ac.at). Available at the author's home page, http://www.research.att.com/~amo.

This is a responsible author who has made us aware of different sources for his paper - moreover the paper is static and appears in the same version at each source cited. I do, however, know of cases where authors have forgotten to update or to remove a technical report from a server following changes made to it after peer review and acceptance for publication elsewhere. This means it is available in the public domain in two very different versions. Could this be a potential problem?

One of the most exciting developments in electronic publishing is the hyperlink. If these are used by authors to refer to data or illustrations elsewhere, this poses another set of quality control challenges, most of which are post-publication. The author might provide a link to a server on which results or other information is regularly updated. Whose responsibility is it to check that such links continue to be accessible to the reader, are relevant to the paper and do not contain any legal infringements? Do they constitute part of the paper or are they definitely agreed to be merely a citation? At present, such 'link maintenance' is relatively easy to control as the number of publications involved is small. Experience suggests that because authors are fairly mobile, i.e. they do seem to change addresses fairly frequently, then the responsibility should rest with the publication. Alternatively, some publications are developing an editorial policy which insists that such links will be edited out unless assurances can be provided that the information they provide is cited also as being accessible from an alternative print source.

The electronic environment at last offers increased ability to publish colour and lots of other types of illustrations (Web-lag allowing). However, beware if colour is crucial to the understanding of a particular point. Certain colours will look totally different on different monitors - something which the publisher and author cannot control. A similar problem applies to the fine detail on a still image. Readers' screen resolutions will differ.

The pace of development of new versions of browsers and new applications software poses its own challenges. No longer is it sufficient merely to check static proofs on paper but in the e-journal environment one must check that the material published can be viewed using a variety of World Wide Web browsers or, in the case of CD-ROM publication, using a variety of different machine operating systems and software packages. I will not go into detail

about the problems at the delivery stage of finding reviewers who have the necessary specialist software packages to view research results produced using state-of-the-art applications. Nor have I mentioned the telephone calls from frustrated users who are not totally at home with the use of certain standard viewing software. More 'post-publication' support is needed from the publisher in the electronic environment. Is this also quality control?

I could go on, and I am sure others in the industry could cite many, many more interesting points for discussion.

Conclusion

Quality control is just as important (if not more so) in the e-journal environment as in the print environment. The requirements of the reader and the purchaser for usability, reliability, accessibility, and robust delivery systems have not changed. The peer review process is still one of the most highly valued methods of quality control and is currently no less time-consuming or difficult to achieve in the electronic environment. Those responsible for providing quality control are encountering lots of new challenges, not merely from the media used to prepare, present and deliver information but also, as a result of economic and other pressures.

References

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3. Hall, Sydney R. A Scientist's View of the Issues and Challenges. In: *Electronic publishing in science,* Proceedings of the Joint ICSU Press/UNESCO Expert Conference. February 1996