Some Thoughts On Peer Review In The Global Internet Context

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Abstract

Thoughtful review and comments from interested and knowledgeable persons are more relevant than ever to motivating original thought, disciplined research and progress. This paper argues that conflicts of interest, fragmentation and an emphasis of prestige and exclusivity over knowledge transfer, are driving the traditional journal publication model to well-earned irrelevance and extinction. The paper summarizes issues encountered by the author in aerospace engineering, strategic affairs and community relations, along with evolving trends in capturing knowledge. The implications of internet based peer review are considered in suggesting a model for peer review and cross-disciplinary innovation, with some preliminary empirical observations on needed refinements.

Keywords: Peer Review; Electronic journals

I. Introduction

As the title indicates, this paper looks at the issues that are familiar to most researchers regarding the system of peer reviewed publication. It considers what may have changed, and what might change, given the preponderance of the internet in modern human communications and expression. The first part of the paper lays out the reasons why the traditional journal system is in trouble. The second part attempts to lay out a viable alternative.

The topic of peer review has brought out several papers at this conference. Samkin [1] uses a case study approach to document the emotive and perhaps haphazard nature of the academic journal peer review process, and how authors navigate through it today. Mavrofides et al [2], highlighting the continuing search for quality metrics, propose a "reference influence factor" to judge the impact of a given paper. Eichberger and Fachbach [3] assess the process and results of peer review applied to an interdisciplinary symposium on an engineering development problem, using quantitative metrics.

A quick survey confirms that the issues run across several disciplines. Examples cited by the authors of Reference [1] discuss issues and solutions from Management[4,5], Economics[6], Law[7], Nursing [8], Nuclear Medicine[9] and other fields [10,11]. The intense feelings regarding the process are evident from some of the titles, despite their appearance in traditional peer-reviewed journals.

Typing the words "peer review" into an internet search engine, and displaying the images that come up, is an easy and illuminating exercise. It is also a dramatic change from just a few years ago, when few researchers would express their thoughts regarding the peer review system in public. A small sampling of the cartoons that come up, gives a good perspective on researchers' opinions. This exercise is best left to the reader, again a luxury that would have been impossible a few years ago. Listing a series of references to the cartoons, or including them in the paper, is superfluous. We will return to other changes brought about by the internet after considering the various issues.

Views on Peer Review

Peer review is used in numerous walks of life, wherever honest, interested, competent evaluations of some operation, product or process are desired in order to establish and improve quality. Medical establishments, accounting firms, pharmaceutical developers, nuclear plant operators, aircraft designers, college teachers, research authors and their sponsors, all depend on peer review to establish the quality of their operations. The West Virginia University library [12] provides a useful working description of peer-reviewed journals, including the purpose of peer review and the expectation of depth. Their definition cites the expertise of reviewers in the field, as well as the expectations that articles are written by researchers or scholars in the field of the journal, contribution of new information to the field, and the purpose of sharing results of original research with the rest of the "scholarly world". Use of citations of bibliographies or footnotes, and technical terminology presume that readers have backgrounds in the same field.

The Reviewing Problem

To understand why good reviewing is such a precious asset, consider what is involved. A conscientious reviewer treats reviewing as a professional obligation to be carried out in a timely manner to the best of one's abilities, making time regardless of reward or hostility. The process for a submitted paper and for an onsite presentation are similar except for reviewer anonymity. Good reviewing takes multiple readings, searching (in both mental and physical archives) for related prior work and context, analyzing the conclusions against the results, and carefully framing questions before arriving at summary recommendations. A good peer review should thus engage the brains of the authors and the editors. People who put this level of thought and effort into such an invisible assignment, are far fewer than submitted papers.

II. Issues With Traditional Peer Review Model

GroupThink

The U. Nevada library's definition of a peer reviewed journal [13] triggers some thinking and arguments. This is in no way to be taken as criticism, but instead points to that resource as accurately summarizing accepted views of most people today regarding peer-reviewed journals. Some issues triggered by their definition are:

1. Author credentials as criteria for acceptance
2. Assumption of a narrow audience
3. Publication as certificate of quality
4. Reviewer credentials as proof of validity
5. Assumption that researchers who review are also scholarly enough to have perspective beyond their areas of specialization.

Saffman [14], points out that "one cannot be a researcher and a scholar at the same time". His reference is to the researcher's focus on narrow depth versus the perspective expected of a scholar. A particularly entertaining example is the Religion in South Asia (RISA) group of the American Academy of Religion [15]. Dominated by PhDs and grand-PhDs emanating from one group at a particular Divinity School [16,17], this group was notorious for shutting out participation even by accomplished senior professors in their own discipline. Posts by questioning practitioners however lucid or expert, were censored as not coming from academics. Posts by academics were mysteriously "lost" due to "computer error". They then felt compelled to bestow their wisdom on all through the open internet, describing themselves with no trace of shyness as "scholars". Several turned out to be graduate students or post-doctoral fellows. Predictably, they generated so much laughter that they decided to shield their scholarly deliberations from the outside world, and led to the notice displayed at their "archives" site when last viewed. This example is illustrative because the group exemplified all 8 symptoms of GroupThink[18], and suffered a shock to the first – the Illusion of Invulnerability. Sadly, similar symptoms are exhibited by other groups of older, though no wiser, "experts" in many fields.

Conflicts of Interest

Conflicts of interest are distressingly common in the peer review process. The dual role of quality control and motivation entrusted to journal editors and reviewers, encounters conflicts of interest, especially when there are underlying competitive aspects and financial pressures. The picture is the same, whether in engineering or pharmaceuticals. In the "Science 1" disciplines, conflicts may have more to do with priority and fame, also leading to large grants. In engineering, it may have more to do with funding for particular organizations, and the urge to keep competing concepts or organizations from getting ahead. Where the associate editors are themselves competing to solve the same problems, and the reviewers may be consultants hired by the editors' organizations, the author with the potentially "disruptive" paper is at a hopeless disadvantage – a situation encountered all too commonly in the flagship journals of aerospace engineering. Several techniques used in "killing" or "sliding in" a paper are listed below.

1. **Delay:** Most journals swear by the dictum that "timeliness is the essence of fairness"[19], but this is of little comfort to authors made to wait longer than the average human gestation period for the first reviews.
2. **Dismissive rejection or glowing acceptance:** While uncritical acceptance of work agreeing with one's own conclusions is a conflict of interest, a very destructive technique is the short, dismissive rejection with the deterrent declaration that the reviewer is an authority on the field, implying that seeking the reasons would only prove the author's ignorance.
3. **Unusually harsh or mild comments:** Likewise, a 4-page diatribe against a paper may deter even the editor's intentions to read and understand. The American Helicopter Society Journal achieved uniqueness in the late 1990s by deleting all (including the primary corresponding) authors except the government author of a paper and then publishing a "correction" front page with the authors' names in the next issue. At the other extreme

is uncritical commendation. More than one journal in the aerospace field have featured articles from the editors' organizations or immediate social circles in practically every issue for several years, with little indication of objective reviewing.

4. **Demand for "additional work":** A tactic used to deter or indefinitely delay publication of a competitor's work, this might be framed as a minimal requirement for acceptance.
5. **"Re-Review" following rebuttal**: Rather than considering an author's detailed rebuttal demolishing a negative review, an editor may send the paper to a completely new reviewer for a "Re-Review", conveying to the new reviewer that the pesky author refuses to go away after 14 months. Can the choice of such a reviewer be better than the original choice? A second and "final" rejection is guaranteed, especially with the new reviewer full of pride at being picked by the editor as an "authority".

Reviewers are anonymous (which is essential) and do not have to defend their (in)actions (which is a problem). The most egregious abuses lead to nothing worse than a hesitation to send any more papers – until the desperate search for "expert" reviewers makes the editor forget. Editors can delay publication indefinitely. The case of the 14-month delay mentioned above is by no means exceptional. Competent reviewers are hard to find – and are usually competitors. From all this, one concludes that ***it is not possible in the traditional peer reviewed publication model to eliminate conflicts of interest.***

III. Extinction of the Traditional Journal Model

The above discussion leads to the proposition that the traditional model of submit, review, rebut, revise, proofread and only then publish, in media controlled by professional organizations or commercial publishing houses, is on a trajectory to extinction. Several indicators are listed below.

1. **Adversarial / arrogant attitude:** The basic assumption of the term "refereed publication" is of an adversarial relationship between the author and the reviewer, with the Editor serving as the unbiased Referee. This model ignores the basic fact that the intellectual property and the contribution are those of the authors, and that people read the journal for the author's work, not to admire the publisher or the editor.
2. **Poor value addition by sloppy reviewing:** Given the stated purposes of peer review, authors have to wonder about the value added if there is no intelligent discussion.
3. **Cost ("paper charges").** Many journals demand money to publish papers. One must wonder why this should be acceptable to any author, beyond the obvious publish-or-perish pressures of the academic tenure track.
4. **Delay:** This is nearly always due to the poor work ethic of the editors and the reviewers. One Chief Editor of one of the aerospace journals mentioned before, sagely advised in the 1990s when asked about two long-pending papers, that in his vast experience, delayed reviews are usually due to the paper being bad. Counseled in return to get his office in order and call back when he had a better clue about his job, he accepted both papers with admirable alacrity.
5. **Poor visibility:** Most institutional libraries are under financial pressures. Far from subscribing to new journals, they are constantly seeking to cut back on subscriptions to existing ones.
6. **Misses the Search Engine Audience:** Many journals (belatedly) do allow titles and abstracts to be found on the internet, but expecting searchers to then pay for the full text is not usually realistic, if one remembers that they also extract hefty publication charges from the authors. Access through institutional libraries is a partial solution, but in this author's opinion, it is also a temporary one given the same library budget problem. Citations will be more numerous on papers that are accessible, and this will sooner or later induce authors to seek publication where the full text can be accessed free of cost, by new authors. Since the above journal models offer absolutely no financial incentive to the authors (or reviewers, for that matter) authors have no motivation other than perceived "prestige" or fear, to keep subsidizing publishing houses with their intellectual effort. They then risk having their work ignored by citations in favor of later, but openly-accessible work by others.
7. **Evolving Reader Habits:** The present generation coming up through college grew up with the internet. They ignore linear or hierarchial methods of organizing knowledge. Their test of relevance is whether something shows on the first few search engine screens.
8. **Casual adoption of technology** in review systems poses its own problems. Electronic submission and web-based access for reviewers are convenient and eliminate much of the effort of printing and mailing reviews. However, these conveniences also do the

disservice of conveying the false impression that a review has been done, and make it far too easy to "fake" a review.

9. **Universities are relying more on "prestige" criteria in promotion/tenure decisions**. The primary support for the traditional paper journals comes from the fear and pressure induced by academic promotion/tenure processes among researchers and faculty. Today, every faculty member appears to be under pressure to be described as being among the "top three" in their field. By conventional definitions, this would result in a drastic reduction in the number of faculty in any given field. The solution is to narrow the field enough, and limit the scope of a journal enough to ensure apparent uniqueness.
10. **Fragmentation and proliferation** of journals inhibits cross-disciplinary innovation. The solution adopted by specialist communities to the lack of competent "expert" reviewers in their narrow fields, is to create ever‑tighter peer circles. This leads to fragmentation of knowledge and "inbreeding" of research communities who have strong interests in keeping the circle tight. Library budget constraints then lead to an interesting effect of the prestige chase: *The most "prestigious" publications may be so exclusive that few can even find them.* This route destroys cross-disciplinary knowledge dissemination.
11. **Academic freedom vs. responsible behavior:** Most researchers and faculty treasure academic freedom, and would attack any and all attempts to abridge this freedom on any account whatsoever. However, academic freedom is most endangered from within, by egregious behavior that does not stand up to any reasonable examination of motives, competence or ethics. Examples of abuses abound. The RISA example arose when knowledgeable community practitioners sought to reasonably rebut [20] outrageous "scholarship" bordering on criminality [21]. Scholarly communities that do not welcome and facilitate well-reasoned disagreement from "lay persons", are not worthy of respect. Knowledgeable community members shut out of so-called "scholarly journals" form their own responses"[22-24], arguably reaching far more readers than the journals do.

IV. So Why Have Peer Review?

Thoughtful review and comments from interested and knowledgeable persons are more relevant than ever to motivating original thought, disciplined research and progress. In brief, they

- Help set in context of prior work
- Ask questions that clarify the author's thinking, calculation, presentation and writing
- Catch errors
- Facilitate rebuttals, revisions and explanations
- Increase utility to other readers through an open discussion of important issues.

This list does not include the commonly-assumed purpose of "Accept only High-Quality Papers". Some process for rejection is essential, if only to encourage other authors to devote their best efforts. A high rejection rate however, is a low-quality metric of quality. The journal's responsibility to not publish nonsense must be weighed carefully against the risk of rejecting innovative work. There are better ways to ensure quality, as discussed later.

V. Technological capabilities and evolving trends in capturing knowledge from prior work

The key to solving many of the issues with the traditional journal system, is to remove the power to obstruct publication, without removing the power to pose countering facts and opinions. The function of protecting the public from wrong theories, data or results through censorship, must be given up and replaced with the function of presenting competing views and letting the reader make informed decisions. Internet Search Engines brought about a continuing revolution in access to knowledge. In the 1990s, we spent considerable effort conceptualizing how to guide learners towards the most appropriate resources. Our efforts were swiftly overtaken and rendered irrelevant as users adapted intelligently to the endless possibilities of Search engines, and the engines themselves improved immensely in speed and accuracy of finding relevant material. Resources such as "Google Books" and "Google Scholar" have done much to rebut the irrational disdain of "scholars" for internet-based publication. Delivery to personal communication devices such as e-readers broadens access by another order of magnitude. The internet is global, and even automatic language translation is routine.

One relevant technical innovation is the moderated discussion forum, where moderation involves active, thoughtful participation of knowledgeable entities, not to be confused with the largely obscene "discussions" at most news sites. Many scientific communities and weblogs already have formalized "list-serve" discussions where posts

appear after moderation. Examples of vibrant discussion fora may be found in the Strategic Discussions community. The distinguishing features here include (a) an accountable email address to join, (b) well-guarded privacy of postors, (c) clearly stated scope of the forum and of individual threads, (d) freedom to post and have entire new threads appear immediately without moderator approval, (e) freedom to edit one's own posts, and (f) a system where moderators may edit, move, delete posts and threads, warn, discuss and ban users where they perceive the need. It is dangerous for any postor to assume any knowledge of other postors' age, nationality, location, occupation, or experience. This makes for exceptionally demanding debates, where opinions must stand or fall on logic and facts alone. The usual descent into personal attacks on the mainstream media sites, is actively deterred by the moderators. Such a forum is unmatched for knowledge value, intellectual challenge and indeed for learning experience on debating skills, when the audience is truly global and broad-based in opinion and experience.

VI. Open, Two-Stage Peer Review

How can the best features of the above be captured in journal peer review? Table 1 summarizes a proposed model for cross-disciplinary publication, based on experience with peer-reviewed Strategic Studies journal experience. From [25] comes a discussion of the process adopted by the Journal of Atmospheric Chemistry and Physics. Features are a rapid "access review" stage before immediate internet publication, enabling an 8-week interactive discussion with comments archived and citable. Designated reviewers may remain anonymous, but other commenters are identified. In stage 2, the traditional manuscript review process occurs before publication in the main journal. The model proposed in Table 1 would not require that other comments be signed, but all are subject to moderation for civilized discourse.

Preliminary empirical observations

The primary challenge in this system is in motivating experts to participate. Social-media aspects may be a way to motivate, as seen from strategic affairs discussions, a forum on Space Solar Power, and the recent Gulf of Mexico oil spill, all of which bring out knowledgeable albeit anonymous persons along with a crowd of casual participants. Most engineering journals, however, are not likely to generate many comments from readers. Getting authors to submit articles requires recognition and assurance of the quality control processes and archival endurance of the "journal". Both are tough issues to ensure. Given the low to zero cost of publication, however, authors are able to get their articles cited and mirrored by multiple sites, with the original reference citation included in the article.

Table 1: Proposed Cross-Disciplinary Publication Model

Model	Rationale
Web-based journal with periodical volume and date identifiers	Archival, with swift global search enabled
Submitted on-line in specified format	Possible hardcopy publication
Editor assigns 3 anonymous reviewers anywhere in the world	Editor can reject, and reviews come from several perspectives.
Article posted on-line for comments and response.	No censorship, but comments moderated.
Anonymous review comments sent to author with time to modify or withdraw article	Encourages reviewers to help author improve article without penalty
Remaining debate published with article.	Main quality control; Archival reader sees discussion.
Further comments published as new.	Provides closure in a reasonable time.

Strong moderation is required, especially as author ego is a problem with many authors unused to social media. While such media are excellent in stripping the "credentials" cover from opinions, thoughtless comments can discourage participation by people who expect somewhat deeper discussion. However, one can safely say from experience that such problems are no less or more in social media than in august gatherings of international experts.

The Journal of Atmospheric Science reports an excellent "impact factor" for their articles, and points out that their system "deters submission of low-quality papers", thereby achieving a low rejection rate along with the high impact factor. This is an encouraging sign that open publication with peer review and discussion can provide a solution to many of the problems with today's journals. Some remaining issues are discussed in Reference [26].

VII. Conclusions

1. The purpose of peer review should be carefully re-emphasized
2. Abuses cannot be avoided with traditional

paper journal review system
3. Evolving technology and habits, and the fragmentation of time that many experts face, have driven traditional peer reviewed paper journals to the verge of irrelevance.
4. Swift and unobstructed publication is essential.
5. Open but moderated, interactive discussion provides good quality.
6. Archiving reviews and rebuttal is a good experiment.
7. Motivating participation and ensuring archival endurance require thought and resources.

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