OPEN KNOWLEDGE CREATION: BRINGING TRANSPARENCY AND INCLUSIVENESS TO THE PEER REVIEW PROCESS1

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The peer review process that has been in place for many years has recognized shortcomings. The Internet provides a means for changing this process. This paper offers a more transparent and inclusive design for peer review referred to as open knowledge creation. The design proposed utilizes Google knol and group services. The open knowledge creation design consists of four stages: creation, review/revision, evaluation/adoption, and publication. It is intended to offer existing or new journals an alternative to the traditional peer review of research.

Keywords: Peer review, communicating research, Google knol and group services

Introduction

Richard Watson contends that the traditional posture of IS has been "too much of IS scholarship is studying what others have invented, or codifying the experience of others when we could be more influential and respected if we were creators rather than reporters" (Gray et al. 2006, p. 35). He believes that the IS discipline should take a leadership role and act as a change agent for moving the academic community into the Information Age.

At the 2004 International Conference on Information Systems, Watson suggested a number of areas where the Information Systems discipline should lead with changes in the management of its journals (see Gray et al. 2006). His suggestions included

- Improving the quality of reviewed papers by accrediting reviewers
- Creating a market for journal articles in which editors would bid for articles accepted by the accredited reviewers
- Moving our journals to the next level of Internet sophistication

Among the advantages accompanying Watson’s suggestions are higher quality reviews, fairness to authors by shifting the balance of power between journals and authors, shorter times to decision and publication, better use of reviewers (a field’s most scarce resource), better leveraging the Internet’s capabilities, and demonstrating leadership within the scientific community. A brief survey was administered at the 2004 ICIS concerning Watson’s presentation. The survey findings appear in Table 1.

1Carol Saunders was the accepting senior editor for this paper. Juhani Iivari served as the associate editor.
Table 1. Survey Responses from Richard T. Watson’s Presentation at the 2004 International Conference on Information Systems (Gray et al. 2006)

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you believe the current system of reviewing scholarly articles is generally fair or unfair? (n = 74)</td>
<td>Fair</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Somewhat fair</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>Somewhat unfair</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>Very unfair</td>
<td>16%</td>
</tr>
<tr>
<td>Does the publication system work? (n = 75)</td>
<td>System needs change</td>
<td>71%</td>
</tr>
<tr>
<td></td>
<td>System works</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>Not sure</td>
<td>1%</td>
</tr>
<tr>
<td>Create a market for articles? (n = 81) (The suggestion was made to create a marketplace where Senior editors (SEs) bid for papers based on an Associate Editor’s report and AEs can recommend papers to SEs)</td>
<td>An improvement</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>Worth Council study</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Prefer status quo</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Not sure</td>
<td>8%</td>
</tr>
</tbody>
</table>

Conclusions from the survey include the following (Gray et al. 2006):

- There is almost universal dissatisfaction with reviewing
- We have only begun to adapt to the Internet
- The lack of structure hinders productivity
- IS should lead the way

One problem with quality control is argued to be the lack of consistency in reviewing (Gray et al. 2006). Reviewers can vary in the value or importance they place on the content of papers they review. As Watson points out, in this situation “authors whose work is not good enough for publication in a particular journal are sometimes also asked to judge the quality of articles submitted to the same or a similar quality journal” (Gray et al. 2006, p. 33). Watson further states that reviewers are scarce and given the reviewer variability the prospects of getting a paper accepted “is a crap shoot.”

Although a comprehensive solution to these issues is not presently in use, Watson’s survey results suggest some changes are desirable. This paper offers a design that can be used to address a number of the concerns associated with peer review, an area identified by Watson and by Straub (2008c) as in need of improvement. The peer review process proposed utilizes the Google knol service for authoring, reviewing, and publishing.

Much has been written about open concepts versus those that are closed or tightly controlled. Open concepts have such labels as “commons-based peer production” (Benkler 2002, 2006), “wisdom of crowds” (Surowiecki 2004) and “open innovation” (Chesbrough et al. 2006). These open concepts suggest a different approach to peer review from the current practice by expanding the opportunities for participation.

Straub (2008a, 2008b) notes that the traditional journal review process has two risks: (1) the reviewers’ view of a paper is to accept while in retrospect the IS community’s view would have been to reject and (2) the reviewers’ view is to reject and the IS community’s view is to accept. Both errors are undesirable since they conflict with the objective of journals: “to publish good, and occasionally great, papers.” The second risk could be eliminated by accepting all papers. However, this approach is not realistic under the present system of publishing not only because the publication space in physical journals is limited, but also because the quality of the journals would be diluted by the publication of poorer papers. The first risk could be reduced by accepting significantly fewer papers. A main objective of this paper is to address these risks by offering an alternative design to the present peer review process.

Other Methods of Communicating Research (Not Peer Reviewed)

An alternative approach to communicating research used in the hard sciences is arXiv (pronounced “archive”). arXiv uses electronic copies of papers to make information known. Its existence was one of the contributing factors leading to online scientific publishing, known as the open access movement. If adopted it would most likely result in the eventual

3 arXiv is owned and operated by Cornell University, a private not-for-profit educational institution. arXiv is funded by Cornell University Library and by supporting user institutions. For information, go to http://arXiv.org.
disappearance of traditional scientific journals. Many professional mathematicians and scientists regularly upload their manuscripts to arXiv for worldwide access and sometimes for reviews before they are submitted to peer reviewed journals. Authors submit their manuscripts to arXiv and moderators for the area review the submissions only to ensure that they are not off-topic. The moderators are volunteers who have been approved by the discipline-level advisory committee and by the arXiv staff. Although comments on the manuscripts can be made by readers, there is no assurance that helpful comments will follow. In essence, the arXiv archive houses many manuscripts, some of which are subsequently submitted to peer reviewed journals. The advantage of arXiv is that it makes results available much earlier than publication in peer reviewed journals. However, it does not guarantee their accuracy or importance.

Another alternative approach is the Social Science Research Network (SSRN). SSRN’s objective is to quickly disseminate social science research. It is organized as a number of specialized research networks in each of the social sciences. Each specialized network encourages the early distribution of research results by publishing submitted abstracts and working papers. The networks encourage readers to communicate directly with authors and other subscribers concerning their own and others’ research. There is no formal peer review in SSRN.

Open Knowledge Creation Design and Its Implementation

The design proposed in this paper is referred to as open knowledge creation (OKC). OKC’s goal is to improve the peer review process for existing or new journals. Open knowledge creation uses the Google knol service as the primary tool for authors, editors, and journals. A general discussion of a similar approach to OKC is given in Hardaway (2005).

The Google knol service offers some convenient features that can be helpful in increasing reviewer participation. When a manuscript is created using the knol service it becomes referred to as a knol. Subsequently a link to the knol is posted within a Google group. Participants who offer feedback on a knol also have their contributions documented by the knol service.

There are other benefits to the Google knol service. With the feedback to a manuscript recorded as part of the knol, one can simply click on an individual’s name and see all of his/her papers and feedback to other manuscripts currently published as knols. This capability offers a convenient record of an individual’s scholarly work all in one place. Being able to review a person’s scholarly efforts provides transparency so that the community can see the contributions made by others.

Google Groups is used in OKC to segregate papers based on their topic. Groups would be created in advance by the journal with each group representing an existing special interest group (SIG). Members of the IS community would join those groups in which they are interested after notification on ISWorld. Organizing the IS community around existing SIGs tailors communications to those most likely to have similar interests. This also helps to manage the number of emails each member receives since Google’s group service automatically e-mails postings made by a group member only to other members of the same group.

The creation of the groups would be administered by a journal. Once members of the IS community join the group(s) that reflect their interests, use of OKC can begin. In addition, editors for each group would be assigned by a particular journal (e.g., MIS Quarterly) so they can assess the posted manuscripts when they are ready for consideration.

When an author believes that a manuscript is ready for review, the author requests feedback by posting an abstract and a link to their knol in the appropriate group. The four-stage design of OKC is shown in Figure 1 and includes the creation, review/revision, evaluation/adoption, and publication stages.

Creation Stage

OKC begins with the creation of a knol. As illustrated in Figure 1 each knol serves as a master whereby its multiple authors can make revisions using the on-line editing features. The knol service records all versions (past and current) of the manuscript. Since the knol service creates a new version (there could potentially be hundreds of versions) every time the knol is saved with a change (small or large), the author(s) determine which versions of the knol to make accessible to the community.

Review/Revision Stage

Before a knol can be reviewed, the author must choose from among three collaboration models.
• Open collaboration model: members of the appropriate Google group(s) are allowed to edit the knol

• Moderated collaboration model: members of the appropriate Google group(s) may suggest edits to the knol, but these edits need approval from the author before the original manuscript will incorporate the suggested editorial changes

• Closed collaboration model: only owners/authors of the knol may edit the knol (i.e., manuscript)

Potential reviewers are notified by the author’s posting of a link to the knol in the appropriate Google group. The abstract included in the posting allows IS researchers to determine if the research falls within their area of expertise and current interest. Since some people consider themselves as experts in relatively narrow areas whereas others may feel their expertise spans a rather wide range of topics, quality control may be a challenge. It may be helpful that members of a group will be initially smaller in number and over time a better sense of each person’s expertise may emerge. In addition, the link to the knol is sent only to the members of the group so unwanted participation can be minimized.

We recommend use of the closed collaboration model at the outset since OKC is a new way of doing things and thus a phased-in implementation is probably the best initial approach.

There are four types of feedback available to a knol.

• **Numerical Ratings**: used to provide an overall rating of a knol based on a five-point Likert scale assessment

• **Comments**: used to address specific points in the manuscript or to raise specific questions

• **Edits**: used only with moderated collaboration

• **Reviews**: used to obtain a more thorough critique of the entire manuscript
Each of the four types of feedback can be obtained from a solicitation by the author(s) and/or group editors.

Feedback will vary. For example, some may feel uncomfortable with unorthodox papers and tend to post negative responses. It is believed this will be moderated to some extent by a more transparent process where all feedback reveals the identity of the reviewers unless the reviewer purposely wishes to post anonymous feedback. We believe the non-blind aspect of the review/revision stage will encourage constructive collaboration between authors and other members of the academy. Our hope is that over time the transparency of the OKC process will result in increased beneficial feedback and be received in a more positive manner. An additional advantage to having the feedback posted is that the author(s) or even the reviewers have the opportunity to interact with one another. This could help clarify different points of view. Although they will consider the content of all forms of feedback, the responsibility of making a recommendation to the senior editor lies with the group editor.

Once reviewers begin to post feedback the authors can monitor the remarks and make revisions to the manuscript based on their judgment of the critiques. This process would continue until the author(s) decide to close the review. After closing the review and making revisions, the author(s) are ready for a group editor to formally consider the manuscript. Although the OKC process is different than the practice used today, editors in OKC would have basically the same roles as they do now. The group editor5 may also want to solicit one or more reviews in addition to those resulting from the group’s feedback. At this point, the group editor may confer with a senior editor about which reviewers to invite on especially promising papers.

Watson suggests a paper marketplace whereby authors post their papers and IS journals shop for papers of interest. We do not recommend an open marketplace for OKC. The idea of a marketplace may be implementable at some point in the future but is not advised at the outset. Instead, as suggested so far, we recommend that one journal use OKC and fully implement it.

**Evaluation/Adoption Stage**

In the evaluation/adoption stage, editors responsible for each Google group could review the knols to identify manuscripts that they believe have potential. Manuscripts with potential can emerge in two possible ways: (1) a journal may decide to have its group editors scan knol postings in the group to which they are assigned or (2) the author(s) may notify the group editor once they think their knol is ready for consideration. The group editor then assesses the knol and, after completing the review process, forwards all manuscripts judged to have potential to a senior editor. If the author(s) do not agree with the group editor’s assessment, they still have the option to formally submit their paper to the journal even when the group editor has not recommended that it be forwarded. Such papers likely would have a more difficult time making it successfully through the journal’s formal review process.

For those manuscripts forwarded by the group editor or formally submitted by the author, the senior editors would make the decision to proceed forward with an acceptance without further modification, send the paper out to additional reviewers, continue with revisions, or reject the manuscript. Hopefully, the senior editors would take into account the various types of feedback on the knol before making their decisions.

**Publication Stage**

The publication options in OKC include the publication of manuscripts (1) in the traditional manner (on paper or electronically) and (2) in the form of a Google knol. The knols can then be added to a Google “collection”6 that could house the journal issues. Knols in the OKC design would be easily accessible by both the IS community and the public since Google’s search engine can be used to find papers of interest.

**Encouraging Reviewers**

Obtaining the participation of reviewers is vital to the success of OKC. Adjusting to a new process that involves valued academic capital will be a challenge. This adjustment will require active and continued journal support.

One approach to encourage participation from the IS community can be found by understanding how participation in open source development has occurred. An open source

5In OKC, the role of the group editor is envisioned as comparable to that of an associate editor.

6A collection is an easy way to group knols together and link to them. A collection looks like a knol with most of its content being a list of related knols.
project starts with one or more developers beginning a project by posting it on the Internet (i.e., Sourceforge.net) and carrying the initial burden of the coding and governance. They become the managers for the project and govern all aspects of the project including the content and participants. If the project is of interest to others, then they would begin to develop code and offer it to the managers of the project for consideration while others may just suggest desirable features. If the contributions are considered good they are adopted. When programmers make a substantial number of quality contributions, two things typically result: (1) they establish a reputation within the community as good programmers, and (2) they are often asked to assist with the governance of a project.

The possibility of escalating reviewer visibility and reputation within the IS community is particularly likely in the OKC design. As use of the OKC design matures, editors will become aware of an increased number of individuals in the field who provide thorough knol reviews. Additionally, editors will be able to identify good reviewers based on feedback from the authors about the usefulness of the reviews, as well as their own evaluation of these reviews. Based on their quality reviews and demonstrated expertise, outstanding reviewers may be asked to join the journal’s editorial board.

**Expanding the Reviewing Community**

Today the majority of reviewers come from those involved in the active creation and dissemination of research in IS journals and academic conferences. An important goal for the future is an expansion of the reviewer pool to include faculty and/or Ph.D. students who often have considerable expertise in one or more area(s) of the discipline. The implementation of Google groups combined with a modified recognition system (see below) may expand the involvement of these people in the reviewing process. To engage reviewers more fully, we believe that a change in the recognition of a faculty member’s research activities merits consideration. For example, in addition to considering refereed journal articles, refereed paper presentations at conferences, and funded research grants, institutions could recognize faculty members for sharing their expertise through thorough manuscript reviews. The issue of “what constitutes scholarly work” is an ongoing debate where consideration beyond the current practice will need to be evaluated. For further discussion of scholarship assessments see Boyer (1990, 1996). Boyer has discussed this topic of scholarship extensively in a special report by the Carnegie Foundation for the Advancement of Teaching titled “Scholarship Reconsidered.”

**Types of Scholarly Contribution**

The OKC design will require greater incentives for reviewers than those that exist today in order to increase the level of “meaningful” reviewer participation in the IS community. Current practice provides credit for authorship and coauthorship. Many institutions divide authorship into percentages of contribution when evaluating faculty. We suggest that faculty be given greater credit for scholarly contributions in the reviewing area. Table 2 contains proposed types of scholarly contributions in order of merit.

We propose that journals regularly recognize “Noteworthy Reviewers” in their print versions. This would be determined based on the best reviews for all manuscripts submitted whether ultimately accepted or rejected. In addition, the reviews submitted by OKC reviewers would be accessible to anyone since they are stored as part of the knol. The group editor would decide which OKC reviews would be considered noteworthy. Authors could also suggest reviews that they found particularly helpful.

**Reflections on the Trial**

During the initial review of this manuscript, the senior editor suggested that it be created as a Google knol so that a pilot test of the review/revision stage of the OKC design could be conducted. To solicit reviewers, she sent a message out over AISWorld. The message acknowledged concern with the paper review process and encouraged a response to the two alternative papers. One, a paper on reviewing using wikis, has already been published in *MIS Quarterly* (Kane and Fichman 2009; see www.socialtext.net/MISQ5040 for an example of reviewing using wikis.). The second is this paper, which was reviewed on the knol (see http://knol.google.com/k/don-hardaway/open-knowledge-creation-improving-the/1x6me0hip0htm/17). At the end of the trial period, the senior editor posted a response in a knol that contained the following initial paragraph:

In the spirit of the KNOL I will make my comments as Senior Editor available to the IS community. As of January 4, 2010, there have been 801 page views, 2 extended reviews and six comments to your manuscript, “Open Knowledge Creation: Improving the Peer Review and Adoption Process.” Clearly your manuscript seems to have created interest and I hope that it has generated some reflection that will ultimately lead to beneficial changes in the current review process that is followed at most IS journals.
Table 2. Types of Scholarly Contributions

<table>
<thead>
<tr>
<th>Type of Contribution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td>Person(s) responsible for the principal investigation, ideas or perspectives that serve as the basis of the paper.</td>
</tr>
<tr>
<td>Coauthor (Optional)</td>
<td>This category would only be used if an institution’s policy were to further break down the degree of contribution within the author category.</td>
</tr>
<tr>
<td>Noteworthy Reviewer</td>
<td>Noteworthy reviewer is a designation intended to more formally recognize scholarly reviews. The senior editor uses this designation to identify a person who provides quality reviews over time. We hope that institutions will give scholarly credit to those who achieve this recognition.</td>
</tr>
</tbody>
</table>

As mentioned above, there were a total of eight contributions (reviews and comments) to the knol. The reviews were very robust and contained a variety of helpful ideas, many of which were incorporated into subsequent versions of the manuscript. Although not as thorough as the reviews, the comments were also helpful. In fact, two of the comments addressed both the content of the manuscript and the content of a review that appeared on the knol. It was valuable to have comments and reviews expressed in the open with the added discussion among those involved in the reviewing process. This transparent interaction does not exist today in the traditional reviewing process and adds value since much can be learned through side discussions between reviewers of a manuscript. Reviewing the points and counterpoints between reviewers adds a new dimension to the types of scholarly knowledge and perspectives that using the knol can provide. We submit that, if OKC becomes the adopted practice for a journal, further discussion will be created not only between reviewers, but between authors and reviewers.

The following are some helpful suggestions from the reviewing process that we used to enhance this paper.

- “The process proposed in this paper at least gives an opportunity for more ‘eyeballs’ on a paper, which may help minimize the luck-of-the-draw problem.” This comment encouraged us to allow authors to solicit reviewers in addition to the senior editor designating reviewers. It also reinforced having special interest groups that would provide an opportunity for even more reviewers to critique the paper.

- “You could also cite SSRN in addition to arXiv” This comment provided us with an addition reference that we incorporated into the paper.

- “When designing a new system, we must keep in mind the incentive system that drives much of scholarly behavior. Incentives influence authors, reviewers, and editors.” These comments from a review resulted in the table titled “Types of Scholarly Contribution” and ultimately to propose the idea of a Noteworthy Reviewer Designation periodically in the journal.

A Concluding Remark

We believe that trying to promote greater participation in the reviewing process enhances the intellectual health of the discipline. Although we do not recommend accrediting reviewers as suggested by Watson, we do suggest recognizing good reviewers. We believe rewarding good reviews with some scholarly recognition will be a step toward the notion of accrediting reviewers as suggested by Watson. The transparency of the OKC process encourages trust and could lead to increased participation in reviewing over time.

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References


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