The Value of Peer Review

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This weekend I was at SciFoo, an invitation-only unconference by *O'Reilly Media*, *Nature* and *Google* that took place at Google. I was fortunate to be invited, and I'm still digesting all the impressions and discussions that I had (there were *many*). This post is the indirect result of two sessions and several related discussions on one particular topic that I'm most interested in – the process of scientific publication.

Peer review is usually seen as essential for the quality of a published paper. At the same time peer review puts a large burden of work on the research community, and in general is unpaid work. But peer review is not living up to its full potential. We should start to see it not as a necessary, costly and time-consuming burden, but rather as a business opportunity. But for this the information communicated in the peer review process needs to leave the (digital) drawers of the journal editorial offices.

The published research paper is the most important piece of information used to evaluate the reputation of a scientist (the published book takes that role in many social sciences). This evaluation is most important when large sums of money and the personal careers of the involved scientists (in the form of research grants and jobs) depend on it. We usually begin with applying some sort of metrics to the publications of the scientist(s) under evaluation, most often the Journal Impact Factor. Once we have reduced the number of scientists and papers to a small enough number, we can start reading the full-text papers in order to evaluate the quality of the science. Both approaches have shortcomings that I don't want to go into detail here (citation metric: artificial number, delay of several years if relying on citation counts; reading full-text paper: time constraints, often needs outside experts as science has become so specialized). The information contained in the peer review process is a large untapped resource that could potentially overcome many of these shortcomings.

The typical revenue streams of a scientific journal are currently subscriptions and author submission fees, and to a lesser extend advertising and subscription-based added value in the form of news items and editorials. The information contained in the peer review process is extremely valuable to granting agencies and job search committees and has the potential to become an additional

major revenue source for scientific journals, thus allowing a reduction in author submission fees and/or free full-text access without a subscription. Many research organizations and funding agencies currently pay for journal subscriptions and author submission fees. If they would pay the journal publishers similar amounts of money for peer review information, they would obviously get much more value out of their money. Whereas this revenue would probably come mainly from granting agencies, large research organizations or companies would also pay for this information, as would the typical academic journal reader (obviously a much smaller sum) if it helps in filtering out the most relevant scientific papers.

The peer review process obviously would have to change in this model. If peer review becomes a major source of revenue for the journals, reviewers need to get paid for their efforts. And it will affect of what reviewers and editors write in their assessment if that information might later be seen by third parties – even if they remain anonymous. It is also not clear if the peer review information of rejected papers should be used (a large body of information at journals with high rejection rates). And if journal publishers don't buy in that model of selling peer review information, nobody stops other parties from doing additional peer review of papers already published and selling that information. Which sounds pretty much like what Faculty of 1000 is doing, although they seem to be targeting the academic journal reader rather than the much more important funding agencies.