A New Approach to Electronic Publishing

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Abstract: I describe here how publications such as books and articles can be organized in an electronic archive that constantly evaluates the quality of its contents and pays the authors and their institutions according to the quality of their work and the degree to which their work is accessed. This system combines the speed and accessibility of the internet with the credibility of review-based journals. The resulting model is based on a ratings structure which tracks the worth of an article or publication as well as of the author(s). Any member of the system (authors and readers) may review or submit a rating of any work on the system, and the degree to which a review affects the overall rating of a publication depends on the reviewer's rating in that field. The final effect is a system in which the evaluation of works is not static but changes with time depending on how experts in the field perceive that value of that work. It is therefore more accurate and fair than the current journal system.

Superimposed on the ratings structure is a financial model that compensates both author and reviewer for their work. The payout is based on the ratings achieved as authors and reviewers and is geared toward encouraging researchers to produce more and higher quality works.

Contents

1. Basic concepts

Journal publications involve long time delays and don't convey the ideas contained in articles to a large enough audience. The internet is a potential solution since access to a large audience is quick and easy. But there is currently no means of assessing how credible the material uploaded on a website is. The system I propose here is an attempt to combine the best of both worlds, i.e. the credibility of journals with the speed and accessibility of the internet.

1.1 Electronic Submissions and Access

I do not need to elaborate on how much faster and cheaper it is to publish electronically rather than through hardcopy; this is an obvious advantage. But before this

can be considered as a viable option, the credibility issue of internet publications must be addressed, and this is described in the following section.

1.2 ratings structure

1.2.1 Rating Structure

The basis of the system I propose is its rating structure. Each article has ratings in a number of different fields, where fields such as art, history, science, or perhaps the entire Dewey Decimal range, apply. An article's rating in a field is an average of the ratings given by its readers in that field. Since any member of the system may rate any publication on the system, the average results from weighting the evaluation submitted by each reviewer by the rating that that reviewer has achieved in the field that he is rating the article.

For example, we would not expect an artist without an engineering background to be able change the engineering rating of an article on optimal pipe sizes. Similarly, we would not expect an engineer without an arts background to be able to change the rating of an arts article. In addition, even though a member might be an artist, if his rating in the field of art is low (i.e. his work is recognized as being substandard) then his opinion (his rating) of a publication would not change that publication's rating significantly. Conversely, an artist whose work is regarded as ground-breaking and original will have a high rating in arts (a good reputation) and if he rates any article, then that article's overall rating in the field of arts will be affected significantly.

And how does one increase his rating such that his opinion becomes highly valued? By producing high quality works on the system that do well (i.e. become highly rated) and 2) by receiving an education in the field. That is, a member's rating is determined by taking the average rating of his publications in a particular field. For example, an auto-mechanic who has written 5 articles on fixing car engines, three of which are rated excellent and two of which are rated 'average', will achieve, as an author, an overall 'good' rating, and this will be his rating in the field of automechanics.

This example illustrates that this system encourages its writers to produce high quality work. Note that the terms 'average', 'good' and 'excellent' are numbers on a certain scale.

But the immediate question would be: why would anyone bother to maintain a good rating on this system? Why would people bother to write articles? Why would people bother to rate any article?

The first reason is the idealistic one: people have a fundamental interest in creating new knowledge and ideas, and in providing assistance to the knowledge management process.

A second and more realistic viewpoint is based on the financial incentive. In other words, people will have to be paid for authoring an article and for submitting ratings.

1.3 Financial Model

To pay authors and raters, we require income for the system. One form of income would be subscription to the system. For example, if each user subscribed at a rate of $5 per month, then part of this income is reserved as membership fee (around 50c per month) and the remainder would be paid out to the authors and raters. If there were two hundred thousand members, then the system would receive an income of $1m per month.

This income would then be distributed among the users based on how well their articles are doing and how highly their ratings are sought after. For example, if a user writes an article that becomes famous and highly rated, then he may claim a certain value for his article. Let's say that his article was rated at a value of 5 and it was downloaded 20 times in a certain month. That article then has a value of 5x20 = 100 for that month. Let's say that the total value of the system (obtained by multiplying the rating of each article by the number of times it was downloaded and adding it all up) was 200,000. Then the payout to the author of that article for that month would be $1m x 100/200,000 = $50, which is five time more than his subscription fee. If he has many articles that are highly rated, then his income is potentially quite substantial.

So much for incentives for writing articles. On the other side of the coin, we must also encourage members to rate articles. As such, a certain fraction, perhaps 20%, must be reserved for paying readers for submitting their ratings of articles written by other people. These funds would be distributed among the raters depending on how highly they themselves are rated. That is, if two people rate an article, then the most highly rated user will receive proportionally a greater share of the funds allocated for rating that article. Given that submitting a rating involves far less work that writing an article, any incentive would encourage rating activities. Of course, to avoid the case of members who have a rating and are

simply hammering the system with ratings for articles they haven't bothered to read, every rater should also include a short comment on his reason for submitting the rating that he did. Further safeguards against this kind of abuse are outlined in Section 4.2.

Now it must be said that this is not a 'magic' system; it cannot create money out of thin air. It can only pay the system members out from the income that it receives. If the system receives only subscription fees, then the average user who authors articles will receive a payout that is very similar to his subscription fee. It is the highly-rated author who can earn many times his subscription fee. The member who has only an average rating will get back his subscription fees less his membership fee (the 50c per user per month needed to keep the system running) and so will not make a profit. The member who has a low rating or who does not submit articles or ratings will earn less than his subscription fee. For the average or low-rated member, subscription is still valuable, since it grants access to a knowledge base that is constantly growing, constantly evaluating and constantly organizing itself. Given the importance of access to credible, well-organized information today, I would say that membership is worthwhile for both the average and the low-rated members.

We recognize this to be quite fair; the system gives us all the equal opportunity to present our ideas, and the best ideas receive the most funding. The authors with the best ideas have, through this system, earned some freedom to enable them to think up newer and better ideas and to keep on producing.

The situation is completely different if we organize the system such that it takes advantage of the fact that many organizations around the world, including governments, pay large sums for well-organized information and knowledge. In this case, even the average and low-rated members will earn much more than their subscription fees. This additional income is generated in the following ways:

1.3.1 Directed donations

Let's say a medical research foundation is looking for the cure to a particular disease. This foundation could make a directed donation, or a donation that will increase the payout to people who are writing articles on the curing of that disease. Again, the payout of this amount will be based on the rated value and number of downloads of the articles in that field.

In fact, to encourage intellectual growth in any country, each government contributes substantially to its researchers that publish in accredited journals. If accreditation is equated to rating beyond a certain value, then these donations could be directed to citizens of that country publishing on the system. If, for example, the US government were to donate $1m to US citizens, then the authorship payouts to US citizens would be substantially greater, encouraging its writers/researchers to produce more and better quality articles.

In fact, countries typically contribute a lot more than $1m to universities for academics to be rewarded for their publishing efforts; the numbers run into the 100s of millions of dollars. I propose that a portion of these funds could be directed toward the research activities of the academics (as some universities already do) and even toward the salaries paid to the academics. This does result in some philosophical challenges, and these are addressed in Section 2.2.

1.3.2 Industry subscriptions

Access to a large knowledge base is valuable in industry, where such knowledge results in financial compensation. If the knowledge on the system is used for financial gain by any business or industry, then that business or industry must pay for this access in the form of a subscription that is much higher than for personal users, or users who are reading for the sake of education and self-betterment rather than for external finance-generating activities.

One potentially lucrative avenue would be software development as well as the generation of multimedia files for use in the entertainment industry. Another would be the generation of an organized database of scientific properties for chemicals and equipment types. These particular avenues are beyond the scope of the present article. At this stage, it is sufficient to point out that many industries would pay subscriptions for access to the works generated by large groups of people if those works were presented in a coherent, rigorously evaluated way.

1.3.3 Employment opportunities

The system can serve as a platform for industry calls for work in particular directions. For instance, if a petrochemical company were to make available $50,000 for measuring the chemical equilibrium of a particular reaction system, these funds would be distributed among the researchers that contribute to this

topic, depending on the ratings of their articles. Advertising companies could draw on the creative talents of tens of thousands of people by offering a certain sum for creative ideas in developing a campaign.

1.3.4 Summary of finance model

In conclusion for this section, we observe that if the system is entirely membership subscription-based, it is quite fair – the highly rated members are well-rewarded for their work, the average users almost break even with their subscription fees, and the low-rated members are content with access to the system. However, if, in addition to membership subscriptions, the system receives directed donations, industry subscriptions and industry tenders, then the system income is greatly increased and even the low-rated members can earn many times their subscription fees.

Industry that uses the system for financial gain has to pay a much higher subscription, with the amount negotiated based on the income derived from using the system. Forseeable major uses of the system for industry would be software development (e.g. plant software that is evolving into something progressively more useful), access to technical data (such as chemical property, finance records), the entertainment industry (access to mp3 and video files) and general software required on-site computers.

2. System philosophy

2.1 Continuum vs. discrete entities

One major feature of the system is that it facilitates the creation of knowledge as a continuum. The present journal/book systems work in a discrete fashion – an idea is presented as a distinct object of publication and it requires effort to identify its place in the relevant field.

Since the system I've proposed makes it possible for articles to be rated according the fields in which they belong, it becomes possible for a member of the system to search through a cohesive, properly organized body of literature that reveals all relevant works presented in one place. In the present journal-based structure, it is very easy for a researcher to miss relevant work for years, due to the presence of several journals with the ideas disjointed in discrete packages. In the system I propose, the rating structure facilitates a continuum rather than a discretization of knowledge in a field.

I can claim that the system is self-organizing because, although an author may release an idea into the general pool, over time, as that publication is rated according to the various fields, it becomes associated with specific areas, and, what's more, the rating itself is an indication of how important that publication is. In other words, the rating procedure results in histogram of each publication which helps the reader to place the value of the work.

And since the histograms of the individual publications determine the histogram of the author himself, it becomes much easier to place the value of the author him/er self.

2.2 Financial distribution in research?

The incorporation of financial distribution into knowledge creation system poses some serious conceptual difficulties. To what extent are we commercializing intellectual growth? What are the dangers of associating economic growth with intellectual growth?

We note that the financial driving force is geared toward authors writing higher quality articles rather than many mediocre articles since the system payouts are value based. That is, the funding allocated to an author doesn't depend on merely the number of publications he has generated, but on the rating that these publications achieve as well. I believe that this is an improvement on the existing system, which credits users with only the number of publications and not the quality of the publications. In other words, the association of financial gain is already inherent in the present system, perhaps in a less obvious way. That is, academics today are driven to publish in quantity rather than quality because the number of publications in their records determines the rate at which they are promoted and the funding opportunities available to them.

In the system I propose, the presence of the financial distribution is made clear and obvious, and, in addition, is related not just to the number of publications, but to the quality of these publications as well.

In fact, I will demonstrate below that the system I propose penalizes authors who strategically distribute and dilute their ideas.

Let's consider the case of two academics, X and Y. Each of these academics has four main ideas, and we shall assign a value of 1 to each of these ideas. Academic X prefers to write high quality articles, and he puts these ideas in one article. Since there are four main ideas, he writes one article which has a value of four. Academic Y is a 'strategic' writer, and he dilutes his publications by

spreading each idea into a separate publication. The profile of these academics is then as follows:

	Ideas	Papers	Ideas/paper
X (quality)	4	1	4
Y (quantity)	4	4	1

The journal system favours academic Y, since he has generated more articles. Now let's consider the new system, and for the sake of simplicity assume that the rating of an article is same as the number of ideas in that article. On the system, the academics would look like:

	Papers (P)	Rating (R)	Value (PxR)
X (quality)	1	4	4
Y (quantity)	4	1	4

In this system, academic Y does not have an advantage over X, since the value of their work is correctly found to be the same. In fact, Y has to do much more work to get the same result as X, since he has to write and somehow publish four mediocre articles. What's more, the rating of an author is the average success of that author. In other words, authorship rating is the total value generated by an author divided by the number of works he has produced. In this case, X would have an author rating of 4 whereas Y would have a rating of 1.

My conclusion to this section is that financial growth is already a (hidden) component of the present journal system, and it is structured in such a way that academics are encouraged to produce more low-quality outputs. The system I propose makes transparent the financial component and shifts focus to quality outputs.

2.3 Dual stream – Research and Education

A second philosophical issue focuses on the speed of publication. Obviously, the system is much faster than the present journal model, since in the journal system, an article is published after as much as two years as a result of review by just a few people who may or may not fully understand the article. It is already obvious that in the system I propose instant uploads and constant review from the entire readership (with review weighted by the ratings of those readers themselves) is faster and more representative or accurate.

But I believe this is only the first step in speeding up the publication process. At present, in document creation, an author spends most of his time in 'polishing'. A would-be researcher burning with an idea must become an 'author' first. I believe this to be an unfair requirement, especially to those thinkers who function best in the abstract rather than the concrete mode.

I therefore propose a dual stream system. The research stream is where the experts gather and express their ideas in shorthand form. This stream may be thought of as the 'workshop' of the knowledge creation system. An expert in a field may write a single line abstract, casually mention perhaps that his idea is in contradiction to a certain model as his literature review, and then give his idea in the few sentences and equations that are needed – and nothing more. In other words, his essential ideas are presented without the padding that has become almost a tradition in publishing an article. In the research stream, it is possible to create a one-page article that has significant research value.

Furthermore, in this stream, the researcher ought to be allowed to express himself in his own vivid style. There are improvements in the clarity and directness of speech used in journals today, but the language is quite stilted and, in my opinion, unsuitable for the research environment.

Still, for ideas to become accessible to the public, well-written documents that present the new ideas clearly must exist as well. I therefore propose a second stream, the education stream, in which the 'authors' rather than the 'researchers' live. In this stream, an author might recognize the value of some work that emerges in the research stream, and elect to write a more expanded document which outlines the implications of an idea, applications and so on. He makes an idea more accessible to the public, i.e. he educates the public about what may be done with an idea. The documents he prepares are owned partly by himself and partly by the originator of the idea, which means that any royalties that issue from the new publication would be shared by the original thinker and by the author who did the work of making the idea accessible.

What are the incentives for activity in these two streams? The research stream is fairly clear: experts are able to express themselves more quickly and perhaps more clearly. They needn't do as much of the work of popularizing their ideas, and when an author does take on this role, they enjoy royalties from works that they haven't really had to put extra effort into. The fact that they belong to the research stream, the cutting edge where experts and great thinkers dwell, also carries with it it's own prestige. To an academic, this would be more important than the royalties they would also enjoy.

Motivation in the education stream should also run fairly high since the methods of taking existing ideas and transforming them into publications are well-established. I believe that authors would define niche areas to work

in, such as translation to a particular language or for a particular age group. The royalties that would accrue from such work would be quite substantial.

But the real motivation for activity in this group is the noble reason of being an educator, of satisfying the thirst for knowledge inherent in human beings.

For educators, this stream could be a particularly rewarding region since it facilitates interaction amongst teachers together with encouraging the sharing of teaching resources. Lecturers may, for instance, find that more of the classroom time can be allocated to conceptual discussion rather than merely presenting information. I believe that today, a large proportion of lecture time goes toward simply presenting mechanical content rather than simulating intellectual development of students. If the education stream were used to generate the basic information, optimized as it is for the various types of student (age, education level, etc.), promoting self-study could reduce mechanical repetition of basic concepts during lecture time. I am not suggesting that texts or video clips (which would also eventually be incorporated as rated publications) could replace the human interaction. I am merely pointing out that the human interaction time available could be focused on more valuable activities/discussions.

2.4 Opportunities for Publishers

The dual stream approach reveals a powerful opportunity for publishers. We recognize that the publishing industry is threatened today. I myself have read novels such as War and Peace, Anna Karenina, the Bagavadh Gita, Shogun and many others, on my laptop computer. Besides the fact that I didn't need to go to library to get them, I actually prefer reading my books on my laptop because I find it easier to navigate and store. There are many people who actually prefer the clumsy hard copy, but I believe that there is a growing population of people who prefer to read as I do.

The point is that publishers of the future cannot rely on printing and distributing as being their primary revenue generating activity. Under the system I propose here, I believe that the next generation role of publishers will be to make ideas accessible to audiences that did not previously have access to an idea.

For example, publishers may contract authors to write articles based on ideas from the research stream for audiences of different language groups, levels of education or even age. Publishers could also be active in inviting highly-rated reviewers to evaluate the works of the researchers whom they represent.

2.5 Subsidies at Universities

Universities receive subsidies from government based on the number of publications generated by its academics. The publications must presently be published in journals on a list of accredited journals. A first step in the system is therefore identifying equivalence between rating levels and accreditation. In South Africa, the SAPSE list is the approved list; it may turn out that an article receiving a rating of greater than '5', for instance, would be considered a SAPSE article.

A university would then receive a payout from government based on the values of the submissions of its academics to the system.

2.6 An end to lengthy funding applications

I described earlier the concept of directed donations, i.e. the option for a funding agency to make funding available for research conducted in a specific field. I submit that this option can be extended to a far more efficient funding process.

A significant proportion of an academic's time is spent writing applications for research funding. At present, a funding agency must perform the administration of advertising or submitting a call for proposals, organizing reviewers of proposals, administering finance distribution and evaluating the status of ongoing projects. This administration itself consumes funds that should be allocated to research.

In addition to the administrative load on both academics and on the funding agencies, the problem with this approach is that it is largely promissory. The funder has to allocate funds based on the promises of researchers rather than on their results. A third problem is that discoveries made by researchers that don't fall into original project specifications are not credited.

I propose that the directed donations approach obviates all these difficulties as follows. A funding agency (such as government or industry) makes an announcement on a system forum that a certain amount of funds are allocated over a certain time period to results being generated toward solving a certain problem, such as curing a disease. Researchers around the globe then compete for these funds by conducting research in this area. Those authors who write articles that become highly rated in the field would claim a larger proportion of the funds available. We note that the funds coming from directed donations are only part of the royalties that the researchers would receive; the other mechanisms for payout from the general pool of funds still apply. The author generates results in a field that he

identifies as receiving directed donations would relieve him to write proposals and give status reports. The entire administrative load is removed from the funding agency since this is handled by the system itself.

Since the donation is 'directed', the agency can specify any number of restrictions on its payouts, for instance, a government body may specify that the funds will only be distributed among researchers from that country, and that perhaps a certain fraction must be reserved for authors below a certain age, so as to encourage younger academics.

I do think that the calls and applications approach will still have to exist, but this would be restricted to start-up research, where, for instance, a researcher without the equipment needed to start research in the first place would apply.

But generally speaking, the more results oriented approach afforded by directed donations benefits both researcher and funder.

2.7 Open-source transparency

The system is obviously based on the open-source concept. In taking the open-source aspect even further, I propose that in addition to the article itself, a submission to the system should also include the data accumulated as well as the software written in processing the data. This is not possible in hardcopy journals due to space and economics; these are not issues in the electronic environment.

The data should contain the outliers that the researcher might have omitted in the associated article, and it should be pointed out which data points have been omitted. This is a large advantage over the present journal system. Such an approach would also make it possible for readers to assess whether the data was processed properly.

In fact, the software written could also be regarded as a publication; it would perhaps contribute to the analysis rating of that article. Software development itself could be a valuable component of the system.

3. Startup strategy

3.1 Software already developed and in progress

A working prototype of the software was developed April 2005. The prototype includes the submission and electronic document creation component as well as the rating feedback structure.

The second prototype will include the financial model well as a more comprehensive article search engine.

3.2 Provisional patent

A provisional patent was registered in July 2005. Why is a patent needed? Besides the obvious benefit to the inventor of the system, a patent is essential for the system since it would prevent splinter-systems. That is, if several bodies begin creating similar systems, we would simply revert to the current problem of multiple journals without cohesion. The patent facilitates a single central system that gives a member access to all fields of research and education.

But more importantly, as the inventor of the system, I acknowledge that the system itself may be regarded as a publication and is subject to change and improvement, just as the publications on the system themselves are. In other words, I am pointing out that knowledge creation is such a fundamental right that its management cannot be entrusted to a few people or a single organization, but must be handled in a democratic way, that is, according to the wishes of the entire knowledge-contributing population. The patent therefore also prevents some other commercial owner eliminating this aspect of self-evolution.

3.3 Local server

The software is soon to be uploaded to a server for internal use among members of the UCT community. This affords the system developers a space in which the 'bugs' of the system (both technical and conceptual/philosophical) can be addressed.

3.4 Non-zero initial ratings

If all members of the system have initial ratings of zero in every field, no member would be able to change the rating of any article. It is therefore required that academics with a proven research record be identified and given non-zero authorship ratings. As these researchers assign non-zero review ratings to articles they read on the system, the authorship rating of the authors of those articles become non-zero, and these members are able to review other works – and so the fire spreads.

3.5 Internal currency

In the initial stages, until the 'bugs are worked out', financial distribution will be simulated by the introduction of virtual credits, which will be distributed according to the value model described earlier.

3.6 Participation of existing archives

The strongest driving force for attracting system membership will be the presence of a large body of well-

organized texts. The organization aspect is accomplished through ratings activities. But how to get large bodies of literature rapidly integrated into the system?

Partnerships will have to be forged with existing publishers. If it is clear that significant royalties can be earned through system submissions, it would be in the interests of the publishing houses to submit the works they have published through their own agencies on the system as well. Partnerships with houses such as Elsevier and Oxford would rapidly increase the literature available on the system. For the education stream, partnerships with internet sources such as the How Stuff Works website and the Wikipedias must also be explored.

4. Solutions to potential pitfalls

4.1 Subscription administration/bank fees

Bank charges associated with processing monthly subscriptions and cash withdrawals due to earnings from royalties may become prohibitive, not to mention an administrative load. It is proposed that the internal currency unit of a 'credit' be used to overcome this difficulty. That is, one system credit is valued at a certain amount of local currency. The system withdraws part of this credit each month as membership fee for expenses incurred in keeping the system running. The user accumulates credits due to royalties earned and may choose to convert this into local currency at any point, or bank it with the system.

Members who are not interested in their royalties and whose publications perform well on the system might never need to make another subscription fee. In other words, the royalty pays for their access to the system. A member will also receive earnings from submitting reviews.

A member who is interested only in accessing the system and not in making any contributions will have to periodically top-up his system credits to remain subscribed.

4.2 Reviewers motivated by financial gain

Since reviewers are paid for their reviews, there might be a temptation for members to submit ratings without fairly evaluating a work, so some safeguards must be in place. One obvious check would be that, together with his numerical rating, a reviewer is required to submit comments revealing or justifying his rating. In fact, this would be valuable feedback to the authors.

A second failsafe would be to limit the number of reviews permitted within a certain time period. For example, a reader should not be submitting a review of an article that he has downloaded just ten seconds ago.

A third possibility is to assume that, over time, an accurate evaluation of an article will emerge. It will then be possible to trace back and identify the reviewers that are consistent outliers.

5. Research questions and opportunities

5.1 Education stream

5.1.1 Creating the attributes that help place the education value of an article

Multiple versions of an existing idea leads to education aimed at specific population groups. What are the fields that must be added to the list of fields by which an article is to be rated? In addition to the Dewey Decimal range of fields by which an article is rated, fields that reveal the presentation aspect of the article must be incorporated as well. And these presentations fields must be specific to readership age, education background, language, perhaps gender, and so on. There should also be a field which indicates how the abstract's accuracy in representing the work. Does the abstract promise more than the article delivers? Irritated reviewers could quickly penalize an article. But the greater the number of fields, the greater the effort in rating a publication. How can all this be done in the most economical way?

5.1.3 Models of ownership in multi-author document creation

How is ownership of a 'presentation' article distributed? This question affects the royalty payouts, and so is a potentially sensitive issue. One possibility is that a fixed fraction, perhaps 50-70% be allocated to the originator of the concept and the remainder to the author who has done the work of making the idea accessible. A second possibility is to develop software that assesses the difference between an original text and an adaptation, for cases where minor but perhaps important changes have been made. A third possibility would to rely on the concept originator and new author negotiating ownership with feedback from readers of both versions through a forum approach.

Also related to this question are issues of plagiarism. Acceptance of multiple versions of a concept with benefit to an original author goes some way to alleviating the difficulties modern educators face in digital plagiarism. To what extent does this system alleviate or exacerbate the situation?

5.1.4 Composing a digital environment for text creation and archiving

The system functions best if documents are created in a dynamic rather than static text environment. That is, rather than PDF-type article files, which limit how far members of a system can copy and edit a system, the system should set a standard for open-source type text. Must new software be developing for writing articles? How to convert existing static-text articles to the new editable format?

5.2 Research stream

5.2.1 Determining equivalence with current accreditation systems

What is the rating value that equates to an accredited publication? Given that the rating of an article changes with time, what happens when an author loses his accreditation due to sudden severe criticism of his works?

5.2.2 Mathematical model for feedback in poor reviews

What are the statistical procedures that may be applied to determine whether a reviewer is making review submissions carelessly? One suggestion is to assume that each publication will eventually achieve an accurate rating. It is then possible to trace backward and determine which reviewers are consistently outliers of the system.

Furthermore, would statistical smoothing help in reducing inconsistencies associated with the different standards of reviewers, or is it best to assume that the average procedure already contains this feature?

5.2.3 Software generation hierarchy

What are the guidelines, hierarchies and logistics to be developed that will enable researchers who contribute software to do so in such a way that integrated development occurs? In other words, how to coordinate the modules of software from different sources into units that accomplish larger functions?

These are just some of the opportunities that arise in researching the potentials of the system itself.

6. Summary and conclusion

The system I've proposed may significantly change the way knowledge is created. It's major features are:

1) speed and accessibility
2) a rating structure that helps organize and correlate incoming submissions
3) a broad reviewership that continuously evaluates the works on the system
4) a financial model that drives research toward quality.

These are the overall objectives of the system. Since the concept is based on the open-source ideals, the rules are subject to change. I submit that these changes must be made in such a way that the steady-state net effect of the system is consistent with the philosophy described above.

Finally, I assert that a system of this type is inevitable. When we weigh the advantages afforded by the digital age against the frustrations apparent in knowledge creation today, a system such as the one I propose cannot but make its appearance. To me, it is clear that it is only a matter of how long we will take to adopt it.

There are sacrifices that will have to be made. Many people have done good work and developed good careers while working under the existing system. We are only human, and it is our nature to protect the way of life that we know and trust.

The way I propose is new and untried, and we don't know how successful we might be under the new system. But if we can recognize the worth of the idea, if we do believe that it can help in our evolution, then it is our duty to let go of our fears and work toward a future in which knowledge is created not in short steps or discontinuous, jerky leaps, but in a smooth and swift-flowing continuum.