A Delphi Survey to Rate GIScience Publication Outlets

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Abstract

A plenary discussion at AGILE 2010 on how to build a consensus quality rating scheme for publication outlets with a declared Geographic Information Science emphasis has led to the Association's backing of such an initiative. A short paper at AGILE 2011 elaborated on the core ideas and led to constructive discussions at the conference on how to proceed, including the formal backing from the AGILE Council for a broader international project. The present paper provides an update, focusing on the Delphi process to be launched at the 2012 conference and its expected outcomes. A first rating of peer reviewed journals and conferences can be expected to become available in late 2012, and mappings to other ratings in 2013.
Keywords: publication outlet, rating scheme, Delphi, performance evaluation, GIScience

1 Introduction

The discussions at AGILE 2011 confirmed the need of our highly interdisciplinary field to present a clear picture of the quality of its publication outlets to outsiders such as selection or evaluation committees who regularly assess our work. Researchers in our field often find it difficult to argue in established disciplines like Geography, Statistics, or Computer Science for the relative strengths and weaknesses of some outlets. There are several reasons why this is a difficult argument to make within the context of GIScience. These include the problem of a narrow focus on indices like Thomson-Reuters' for use in assessment metrics, the relative importance of conferences versus journals, the different criteria used in geography and computer science (as well as other fields, such as statistics or economics), the highly variable meaning of "strong impact factors" across fields, and so on. In addition to projecting an image of widely-accepted publication quality levels to outsiders, it is equally important to be able to help junior researchers target their publishing efforts and to raise awareness about quality differences in publication outlets and other aspects of publishing. As argued in our earlier paper [1], existing analyses of publication outlets were considered inadequate both for their limitation to journals (omitting refereed conference proceedings) and for the lack of consensus and maintenance processes around them.

Many AGILE 2011 attendees also emphasized that a rating scheme should not be based simply on impact factors, nor should it encourage a reduction of research quality to numbers or categories. What we want to achieve is a community-driven and -maintained guide to quality levels, not a convenient metric replacing the need to read and assess the contents of individual publications. Reviewers of theses or vitae, for example, need guidelines for assessments to avoid a simple counting of publications. They should remain responsible themselves to point out methodological innovation and solidity (or the lack thereof) in published research, no matter what rating the publication outlets may have. Here, the move to more encompassing and transparent forms of publication (including data and software) is helping. Furthermore, it was pointed out at the conference that publications are only one aspect of excellence and a publication record needs to be assessed in the context of a scientist's overall performance and potential.

It was also noted that the choice of publication outlets to include in our rating scheme is difficult to make. While our community cannot rate journals and conferences that "belong" to other fields, its researchers publish in such outlets and we need to assess their quality in a compatible way. It was therefore decided to limit the outlets considered to those which have a declared focus on Geographic Information Science (including all its naming varieties as well as spatial analysis) and to define mappings to ratings of other disciplines, once our own is established. These mappings will most likely be determined by another Delphi process, involving experts from other fields, in 2013.

The question whether "others" will accept the rating scheme of GIScience can only be answered once the scheme is established. Giving up before trying does not seem to be a valid option, as the lack of quality ratings already affects several GIScience groups in Europe and elsewhere, which seem to fall between two or more stools when being assessed for their research output. Our approach to achieve wide acceptance by others is to make the publication rating a standard published by AGILE, as an official and recognized European

organization; further steps are planned to include support from additional international organizations in other parts of the world.

The targeted rating standard is not meant to compete with any existing ones, or to replace impact factors and other metrics where they serve their purpose. It should only give guidance to coarse quality assessments of publication outlets for well-defined time periods. A key requirement for the whole process and product is to keep it simple. Thus, the goal is not to *rank* outlets, only to *rate* them by very few categories (similar to credit ratings of countries or banks). It was pointed out at AGILE 2011 that any categories below a second tier are typically meaningless and ignored in existing ratings. Thus, in the initial survey, for the set of publication outlets with a declared focus on GIScience, we will use three rating categories (A, B, C), where A implies "leading", and the difference between B and C is that of fulfilling (or not) the following formal quality assurance requirements:

1. full paper submissions;
2. at least two reviews per submission;
3. internationally composed editorial boards or program committees;
4. sharing of all reviews and decisions with authors and reviewers.

The absence of any of these four criteria places a publication outlet automatically in category C. Thus, B vs. C ratings are based on the quality of the *review process,* not on the quality of published papers. On the other hand, for a publication outlet to be rated "leading" (A), a commonly perceived track record of consistently publishing high quality research is likely to be important.

The rating scheme itself will be community-driven (as explained in this paper) and remain open and adaptable. This should avoid problems stemming from private companies or other potentially biased entities deciding on the fate of researchers in our field. Finally, the main success factor of the undertaking lies in the *transparency* of the chosen criteria as well as of the whole rating scheme.

Following this overview of past discussions, the remainder of this paper introduces the Delphi method in general and shows how it is being applied to the task of defining a rating scheme.

2 The Delphi method

The Delphi method of consensus building was developed by the Rand Corporation in the 1950s [2]. As a structured group communication process, it has been used in many different policy making domains to help choose amongst competing priorities. While often used to extract forecasts of future states from experts and to develop policies when there are many stakeholders with competing values, it has application in many different domains. Within our field, the technique was used in the mid-90s to develop consensus on the contents of a post-graduate GIScience curriculum for Europe [3]. Caron et al. [4] used it to develop a ranking of GIScience journals. They provide additional justification for using the technique for assessing publication outlets.

While the method has evolved a great deal over the past half century, its basic approach is simple. An iterative series of surveys with a single group of respondents evolves from open-ended opinion solicitation to structured voting on a limited number of options. The first open-ended survey elicits opinions from all respondents regarding the topic under investigation. For example, in the case of the GIScience curriculum project, in the first survey, sixty-two respondents were asked to list the three most important skills and three most important knowledge areas that should be included in the curriculum.

The responses from the first survey are then reviewed, reworded, merged and organized to produce a structured summary of the universe of responses submitted. This, of course, can result in a very large set of possibilities. For example, in the GIScience curriculum project, this reorganization and merging resulted in a list of 252 items grouped into 15 categories.

The list produced by this merging and organizing is then presented to the respondents in the second survey round. Respondents are asked to evaluate, choose or rank each of the options listed and in some cases provide anonymous comments to support their choices. In the case of the GIScience curriculum project, respondents were asked to rank each item on a simple three-level scale of important, somewhat important and not important.

Responses from the second round are merged and counted, options may be reworded, eliminated or ordered according to the overall sentiment solicited from the entire respondent group. The traditional Delphi survey concept provides no system for undertaking this critical step of formulating the essence of the group's opinions and much depends on a qualitative rather than a quantitative approach used. While the 1990's style GIScience survey used faxed survey forms, manual coding of results and manual exploration and manipulation via spreadsheet of the resulting data, for this publication outlet rating survey, we have the advantage of being able to collect data digitally, storing it immediately into a structured database. Thus we anticipate that analysis of the collected data will be much more direct and quantitative.

A third and usually final survey round is then presented in which respondents are asked to compare their individual choices in the second round to the results that emerged from the group as a whole. They indicate whether they would change their decision on each option in light of the group's opinion. This third round is a means of confirming that the proposed group consensus is valid. If necessary, a fourth round may be used for further refinement or consensus finding.

3 Design of this survey

The objectives of this survey are to
1. identify GIScience journals and refereed conference proceedings with a declared focus on GIScience (by any name);
2. rate these outlets as A, B, and C (as defined above);

3. collect information about other publication outlets in which GIScience research is published, but which have their focus outside GIScience.

The survey will be advertised through the AGILE web site shortly before the conference. In order not to bias the results towards the opinions of only senior members of the GIScience community, any GIScience researcher who has a PhD or equivalent degree and has published in at least five different journals with broad international readership will have the opportunity to participate in this survey. Potential respondents will be permitted to register once they affirm that they meet this requirement. We anticipate between 30 and 100 survey participants, but impose no upper limit. Less than 15 participants would not be considered representative. The list of respondents will be made public throughout the survey process.

In round one, respondents will assess and extend the list of candidate GIScience publication outlets collected in the earlier phase of this project. In this round, we will also collect names of other publication outlets used by GIScience researchers. Respondents will be provided with fields in which to give their rationale for each choice if they wish. While in later survey rounds, all responses will be presented back to the group anonymously, stored responses will be linked to individual respondents so that their comments can be tracked and returned for their personal re-evaluation in the later rounds.

Round two will collect ratings (A, B or C as described above) for the GIScience publication outlets selected in round one. Again, respondents will be encouraged to provide a rationale for each or any of their ratings.

Round three will present the numeric summary of all ratings, indicating for each publication outlet how many respondents ranked it in each category, and showing the most commonly chosen value. Respondents will see their original rating against this summary and will be asked to confirm or revise their previous response. Round three will provide an opportunity for the participating group of experts to give (or refuse) final approval to the ratings.

4 Expected outcomes

The expected results of this survey are:
- A list of core GIScience publication outlets,
- A proposed rating of these outlets,
- A list of outlets in other fields where GIScience research is published.

With these results in hand, we can proceed to a second Delphi survey in which "our" core outlets are mapped to ratings in other fields. The overall goal is to produce a GIScience publication rating that is solidly founded on GIScience community input, endorsed by AGILE and possibly other organizations, and related to outlets outside our field.

5 Timetable

After the launch of the Delphi process at AGILE 2012 in Avignon, we foresee the three rounds to take up one or two months each. In the fall of 2012, we will start to prepare the next Delphi survey involving neighboring disciplines and organizations in order to establish mappings to other rating schemes. If all goes well, the results of both surveys should become available for AGILE 2013.

Acknowledgments

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