The Significance of Paper Indexing for Computer Engineering Field and the Importance of Prolific Writing

Jun-Ho Huh

Abstract

The accredited junior colleges, universities and graduate schools are being categorized as a higher education system in the Republic of Korea (ROK) as most of other nations do. Likewise, research papers or theses are the ones that summarize one's academic achievements in these institutions, whether he/she is a student or a faculty. While it may be true, there are some serious disputes over the method of assessing such achievements as some problems exist in producing or publishing them. The ROK's Ministry of Education (MOE) under 15th government planned the Brain Korea 21 Project in 1999 to prepare the nation for the 21st century. That is, they wanted to raise some globally talented scientists, engineers or scholars by upgrading the nation's higher education system to meet the global standard, or go above if possible. While doing so, they devised a rather simple method of selecting the eligible schools for their funding. The method was that to count the number of SCI-level theses each school had published and this has become the most important and fastest means for the schools to obtain funds. Nevertheless, the schools later discovered that such a selection standard was quite unfavorable to the Science and Engineering Departments, especially for the Computer Science and Information Engineering fields where the speed of research is essential due to the rapid technological advances and fierce competitions. After accepting numerous and persistent complaints, the MOE decided to complement the problem by acknowledging the research papers published/presented in/at internationally renowned prestigious science journals or conferences as well to speed up the selection process. On top of these, the author proposes the additional use of various indexing forms including the IEEE Xplore Digital Library Indexing, ACM Digital Library Indexing, etc. The prolificacy of science journal papers can be considered as a supportive means of selection criterion as well.

Keywords : Computer Engineering/Science Research Paper, SCI, KCI, Index, School-Evaluative.

1. Introduction

Nowadays, the Editor in Chief (EiC) and the chairman of domestic conference or academia are having much difficulties in securing sufficient number of research manuscripts to prepare their conferences or journal publications so that they are spending much of their time for the meetings or persuasions, even though the results often end up in vain. There’s a simple explanation for this. That is, the eligible researchers want either to be included in the SCI DB
or publish their research paper in reputable international journals rather than domestic journals or conferences. The reasons have been mentioned earlier. Another blow came from the MOE who announced that they were reducing the number of domestic academic organizations as they expect that the number of researchers will also decrease in the future due to the declining number of students, such that they have to impose a higher standard when supporting the organizations. Under these circumstances, it is obvious that the KCI will no longer attract researchers and thereby the government funds cannot be expected to increase any longer.

In this paper, the major issues in the Korean research paper indexing system are presented focusing on the computer science and information engineering. While the SCI-level research history may be one of the logical school evaluation standards, the KCI-level studies can be used as well on a condition that their standard meets the quality of which the SCI requires. The first step is, however, to support more researchers to apply for the publication in domestic journals. Aside from faster approval process, I propose a system that can support them when they wish to apply for the publications. Its first step could be reducing the fees or costs that the candidate researchers like doctoral students, part-time lecturers and non-tenure faculty have to bear in the application process. In an future extended work, I plan to develop an indexing model that can identify high-quality research papers among the candidate’s theses, along with some ways to surmount the problems in the existing Korean indexing system using similar technique to H-index. Historically, adoption of the evaluation system that considers the number of paper (SCI-registered) has started since the latter half of the 1990’s, when the 15th Korean government decided to use the number as an important basis for the BK21 (Brain Korea 21) Project which aimed ‘promotion of graduate school-oriented research universities’. After completion of the 1st phase BK21 Project, the number of SCI-level paper had increased dramatically. The number was 3,765 (1998) before the initiation of the project but it increased twice until 2005, reaching to 7,281. However, the number gradually started to decline afterwards until 2015, forcing reduced circumstances on the domestic academic societies and conferences. Accordingly, most of well-formed theses or research papers are now being seeking registration in overseas SCI. What made the situation worse was that universities started to consider domestic and foreign assessments of their academic levels very seriously since early 2000’s. The number of SCI-registered/published paper has become a major factor for the faculty
research assessment, for the natural science and engineering faculties, it is an absolute standard. In case of the Korea University, it takes about 5 to 7 SCI-registered paper for an assistant professor of natural science to become an associate professor. Also, for the professors in the business or medical department, their theses would not mean much in the assessment process if they were registered/published in the local journals. Even the Hanyang University, who takes an average level evaluation value taken from the faculty research evaluations of 5 upper-class universities like Seoul, Yonsei and Korea universities as a standard when assessing their faculties, the SCI-registered theses are a ‘must’ requirement. H.G.Lee, the dean of academic affairs at the Hanyang University, claims, "the SCI-registered theses are fundamental to appointment or promotion of professors".

2. Raises Issues

Due to the decline in the number of research papers, domestic academic societies are complaining about the difficulty of producing journals.

An editorial staff of the Korean Society, Professor Kim said, "Until middle of 90's, about two or three times more number of theses used be contributed than what was actually required so that selection process was needed always." He also added by saying that they are now barely keeping up with producing the journals as the average contributions are only about 1.5 times of what they need. Professor Lee (Pusan National Univ., ROK) who used to be a Editor in Chief of the The Korean Society of Plant Taxonomists, also pointed out that while current contributions do not even exceed more than 1.5 times of required number, the decline in their quality is another serious problem.

Receiving around 1.5 times is not so bad when compared to other minor journals who get no more than 50%. A professor who works as a chief editor at a small journal publisher claims, "Now that theses are not coming in anymore, we can’t publish any journals." Further, following the strengthened recent research ethics, many researchers tend to avoid publishing their papers on the domestic journals. It has been a common practice for the researchers to publish their preceding researches on the journals belonging to their own societies first and then publish revised or extended papers on the foreign journals later but now they omit the former from the outset because they are worried about getting caught up in the problem of duplicate publications. In Korea, researchers have to pledge how many SCI-level theses they would write in their research proposals so that if one is seeking a promotion to a full professor, they need to fill the number required. Their quality is a secondary problem in this
The Significance of Paper Indexing for Computer Engineering Field and the Importance of Prolific Writing

matter.

The problem here is, however, so-called ‘SCI-level’ theses may not have much meaning to a certain area. It is ironic that the researches are assessed by the SCI-level theses in the field of Computer Science/Engineering we are majoring. Only the collected papers published as a book will be subjected to the SCI-registration and those presented at the conferences will be excluded. However, in the computing field, most of the important research results are presented at the conferences as the speed of development in this field is so fast. It is safe to say that the best papers would not be published on the journals targeted for SCI indexing. This is because it usually takes about two to three years in average for the review and evaluation of a candidate paper for publication and by then, its contents will be outdated. For this reason, many tenured professors in US and Europe present their researches at the renowned conferences only and if their researches have the potential of commercialization, they will apply for patents. Exceptional cases are the publications on the journals like Science, Nature, IEEE, and ACM journals.

Let’s examine specific examples. The both SOSP and OSDI conferences are two major conferences in the field of operation system and system engineering. More than 100 research papers are submitted for publication but only about 20 are selected. meanwhile, in the field of computer architecture, the conferences like HPCA and ASPLOS are considered to be the best ones. Compared to these conferences, journals are considered relatively less important.

Many of the successful candidates are from the schools such as CMU, MIT, Harvard Univ., and others who are traditionally strong in the science and engineering fields so that other ordinary state universities will have much less chance to be successful.

Those who are successful in presenting their researches even once will be famous and have much better chance of becoming a professor when applying for the position after graduation or receiving degrees.

3. Related Research

The Ministry of Science, ICT and Future Planning (MSIP) announced (2016) that in principle, they will not simply reflect the number of paper on the performance index when they assess researcher’s achievement. This is to enroot a quality and performance-oriented evaluation system in the research field [1-4]. Assessments will be made mainly with the key performance achieved by the relevant research institution so that the burden of being assessed by the number of published theses will be reduced and the researchers can focus on their works only.
This policy was made in response to the claim by the scientific circle that the quantitative criterion imposed by the government is interrupting adventurous but enterprising researches. Especially, the Minister Y.H.Choi appeared on a TV program and said, "I have a feeling that the claim by the scientific circle is a little overdue." and promised, "We shall complete the paradigm change in the assessment system by next year." A new evaluation index is being prepared now. The evaluation index for theses have been consistently studied [4-8] and some additional studies are being conducted for the indexes such as H-Index, g-index and etc.

On 16th, the MSIP has announced ‘Implementation Plan for 2017 National R&D Performance Evaluation System’ and explained that they will establish a qualitative performance-oriented evaluation system to create a creative and challenging research environment. The implementation plan has been decided after the deliberation by the operating committee of National Science & Technology Council. Thus, the evaluation will be conducted in principle focusing on the researcher, expanding autonomy, and connecting policy, investment and budget.

To elaborate, first, a simple index pertaining to the number of theses is aborted in the research project assessment process where individual researchers or research institutions present their research objects to acquire the funds from the government. A new clause ‘Quality-oriented project management’ will be created in the self-evaluation report instead. More scores will be given for the application and promotion plan of research performance after completion of the project. Also, the evaluation system will strengthen the linking the periodic (intermediate, specific, and last phases) evaluation results obtained in the past with final evaluation [9-13].

Although it was impossible for those who belong to the same university or institution to participate in the evaluation group, this term will be ameliorated in a way that only the experts who belong to the same department/major with the researcher are to be excluded. Further, the research period for the new or middle-level researchers will be extend to maximum of 5 years (currently 3 years) to avoid them to focus on a short-term success. Also, the evaluation will not be carried out for the projects amount of less than 150 million won.

While the institution assessment is to be carried out based on the 3 or less performance indexes which reflect institutions key assignment (present number of indexes is 3 to 10). Although the autonomy has been expanded, responsibility is strengthened. Starting from 2017, the annual salary of an institution head based on performance will be reduced or limited if the evaluation results are poor.

For such measures, the MSIP explained, "We have not used a simple index that considers the number of SCI theses for the project evaluation already in 2015 and pushed ahead with an overall abolishment of such an index." and added, "We shall make sure that field researchers
feel the change."

4. I Believe Some of the Masterpiece papers will come from the Prolificacy

The author believes that a masterpiece paper would appear among the abundant number of theses written. "What’s the meaning of writing many insignificant theses? We should write a piece of good-quality paper!" This was the words by my junior whom I met last time and asked him why his paper publishing activity was very little. What he had meant was it is much better to write a single decent paper and publish it on a SCI journal or other reputable science journal rather than writing several poorly made theses. With this attitude, he continually engaged in his research so that his paper publication became rare. Indeed, he is right and it is a desirable attitude. When we see some distinguished scholars mentioned in the history or by the Nobel Committee, we can understand that it is the quality of paper that counts when making an evaluation, not the quantity. The quality made them special.

However, you must not delude yourself by concluding that a researcher has been negligent of creative activity as he has not many published pieces. Quite the contrary, you should think that he/she went through a strenuous training period behind closed doors until he/she finally produced an excellent work. As research paper is the aggregated body of researcher’s meditation, anguish and experiments based on his/her experience, it cannot be born without a painstaking effort. Thus, it is not possible to write a decent paper like it suddenly dropped out of sky. Therefore, researchers should diligently write paper night and day. A researcher who doest not do so is like a farmer or a fisherman who does not work hard. Like a farmer diligently starting his work from the winter right after the harvest to get ready for next year’s harvest in autumn, or a fisherman who relentlessly trying to catch a big fish, researchers have to write many theses to produce a piece of decent paper.

5. Experiment at a Pukyong National University

The senior students were subjected to an experiment at a university. Dividing them into two groups and a separate task was given to each group. The individual members in one group were asked to make a piece of work/paper, and for the other group, pieces for each member. All the students were requested to do their best because they would be graded depending on their respective level of work and their possibility of graduation would be decided based on the grades they received. Given period was six months.
What was the result? Although most of you may think that the students assigned the task of creating a single piece of work/paper would have made better ones, the result was quite the opposite. The best work came from the group that had submitted five pieces/papers each. A considerable number of works from this group were of a higher standard whereas the level of other group that had submitted a piece per student was average or below standard.

What we can find from this experiment is that the fine works/papers do not turn up at the first attempt but most likely to emerge from after many trials. Although one could undergo trials and errors to learn the ropes when he/she undertakes several works, the consummate masters often born from these experiences. It is the same with the literary works. Some masterpiece works could emerge from the accumulated experience gained from writing many pieces, even if they are mediocre.

6. Conclusion and Future Work

The major problems in the ROK’s research paper indexing system are discudded in this article, especially for the fields of computer science and information engineering. Although counting the number of SCI-eligible research papers seems like a reasonable way of assessing the schools’ achievements, the number of KCI-eligible papers can be also used to do the same. The question here is how to improve the quality of the latter. This of course will take sometime to achieve but the first step will be to give more supports to the domestic researchers. That is, in addition to faster approval procedure, it will be much helpful to the researchers if the fees or costs of publication can be reduced or subsidized.

In the author future extended work, a revised indexing model will be proposed to identify some of the outstanding papers, as well as some means to solve the problems involved in current Korean indexing system, employing the techniques like H-indexing.

Appendix

The first draft of this paper was presented in Poster Session at 2016 Spring Conference of the Korea Multimedia Society, May 27-28, 2016 [14]. The main topic of this academic conference is The Convergence of 4th Industrial Revolution and ICT: Computer Education, Artificial Intelligence, and others. This study is a pedagogical paper for the conference [14]. I am grateful to three anonymous commentators who have contributed to the enhancement of the paper’s completeness with their valuable suggestions at the conference. The author would
like to thank Emeritus Professor Hong-Wook Huh (Former Dean of the College of Education, Pusan National University; Major of Biology Education, Busan, Republic of Korea).

The second draft of this paper was presented in Oral Session at 2016 Winter Conference of the HSST, Jan 20, 2017 [15]. I am grateful to two anonymous commentators who have contributed to the enhancement of the paper’s completeness with their valuable suggestions at the conference.


References


[10] Carpenter, Mark P, Francis Narin, “The adequacy of the Science Citation Index (SCI) as an indicator of international scientific activity,” Journal of the Association for Information Science and Technology, 32(6),


[13] Bornmann, Lutz et al, “Convergent validity of bibliometric Google Scholar data in the field of chemistry—Citation counts for papers that were accepted by Angewandte Chemie International Edition or rejected but published elsewhere, using Google Scholar, Science Citation Index, Scopus, and Chemical Abstracts,” Journal of informetrics, 3(1), pp.27-35, 2009.
