Essays

Information systems in journal management: the ugly duckling of academic publishing

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Abstract
Researchers know about the computer programmes used by most journals to manage their submission process. Current journal management systems work as standalones, leading to many problems for both authors and editors. In this essay, we propose our recommended conceptual architecture for creating journal management systems that include information systems. We believe these systems will be advantageous, saving time for editors and authors alike.

Keywords: Submission system, journal management, academic ethics, academic publishing

Introduction

Before the World Wide Web, articles and journals were limited to specific regions. With the emergence of web technologies, knowledge found a universal platform and could increase without limitation.[1] At the same time, journals started to use online submission systems. The oldest research concerning a journal management system (JMS) dates to 1973. The author of the first paper referred to the system as the "Network Journal Submission and Delivery". When we read this paper, it was hard for us to understand how it could have been of any use. Certainly it was very good at that time, because it allowed researchers to submit papers remotely.[2] At the moment, there are different types of JMSs. Some of them provide extra functions for editors and let them retrieve previous papers of the authors who submit new papers or to find similar papers published by other authors.[3] Some research includes current experience in creating online JMS by using three-tiered information system architecture or other software development techniques.[4] Some research discusses the use of JMS in a specific context or the experience of editors that use a specific JMS. Some research tries to highlight the advantages of open source JMS and related issues.[5-7] In this essay, we are going to present some current problems of JMSs derived from our experience. We believe that such problems can be resolved by using information systems facilities.

Problems in current journal management systems

The first author has served as an editorial member for various journals and has found some obvious problems in their management of peer review, publishing, and cybercrime. Most of these problems are related to JMSs and can be resolved by improving JMSs. The important problems are as follows:

- Academic journals generally have difficulties finding suitable reviewers, especially in topics that have limited numbers of researchers. Reviews either take a long time or are poorly done. The poor reviews may lead to publication of inferior or even fake papers.[8]
- It is doubtful that the publication of redundant research in many different journals has much of a contribution to science.
- Papers that involve Opinion or Commentary should be provided by authorities in the discipline involved. Currently, there is no good centralised source for checking the qualifications of authorities.
- Journals wanting new editors must spend much time searching, often without success.
- Some disciplines have too many journals and others do not have enough.[9]
- Authors have concerns about journal selection, spending much time waiting for editors to determine the suitability of their manuscript for publication in a particular journal.
- Authors who try to improve on previous research do not have access to previous data and cannot compare their work properly. In that case, replication may be impossible.

The above issues are not a problem for all journals—some may suffer from all, but others may be unaffected. The afflicted journals can try to resolve these issues by using information systems (IS) facilities. Some journals are catching on, but we believe that most are still behind.

The information system (IS) for problem solving

We studied the experience of companies that use IS to understand its role in problem solving. Most companies now are faced with multiple sources of information, growing technology, a global network (such as the Internet), and an information explosion. In this situation, IS is of great help to companies. The goal of these systems is to deliver only the specific information and the communications needed by an organisation.[10] IS helps an organisation to be flexible and increases its productivity and competitiveness[11,12] Over thirty years ago,[12] IS was introduced as a competitive weapon, showing how it would benefit organisations in a competitive world. Many industries have taken the hint. It has been successfully implanted in geographic information systems (GIS), decision support systems (DSS), accounting information systems (AIS) and others.[13-15] It is time for us to improve our JMS usage by including various information systems that are now available or could be made available.

For instance, by using an integrated database, journal editors can find suitable reviewers for submitted manuscripts. It is possible to establish inter-journal communications for finding suitable reviewers, just as there are techniques for finding redundant papers before publishing. Checking the qualifications of authors will be so simple, because by using inter-journal relationships, editors would be able to have insight in all published papers related to a specific researcher.

Publishers that want to register a new journal title can use special utilities to find out if there really is a need for a particular journal in the specific area. Additional utilities can help authors to find a suitable journal by searching an integrated database. Unfortunately, some of these utilities designed as a separate service have many flaws. Nonetheless, by using IS, publishers can establish inter-journal relationships that will help them find the most desirable software and databases. Editors can receive

Table 1. Current JMS and the desirable JMS improved by using an integrative IS

No	Operation	Procedure for doing an operation	
		Current JMS	Desirable JMS by using IS facilities
1	Finding suitable reviewers	Usually use previous reviewers or search in citation databases to find expert people. As finding reviewers in this method needs time, journals with a high number of submitted papers will face delays in processing requests. Also, fake peer reviews are possible.	If journals use IS, they can access a broad list of suitable reviewers by conducting inter-journal/ publisher relationships.
2	Checking redundant research	Use plagiarism detection tools. Unfortunately, these tools cannot detect rephrased papers or papers with similar content.	Semantic technology compares submitted manuscripts with all papers in the field by using inter-journal/publisher relationships. For more information about semantic plagiarism detection use related papers [16, 17]
3	Checking qualifications of authors	Search in citation databases such as Google Scholar to find scientometric data on researchers. Unfortunately, because some researchers have similar names, this will be challenging.	Editors can check qualifications easily by using the journal/publisher relationship to quickly see the publication history of researchers. For example, each author will have a unique identifier that can be used for all journals, such as ORCID. This ID must be allocated to authors after desirable authentication to prevent possible identity theft.
4	Employ new editors	This based on experience or searches in citation databases.	Publishers can find candidate editors by using the journal/publisher relationship to see details about prominent researchers in a particular field.
5	Checking titles for the registration of new journals	This operation usually is done by using search engines or libraries, but some journals do not reflect their scope. Also, some topics have too many journals (Caon, 2016).	As we provide inter-journal/publisher relationships, it will be possible to find the areas that need more attention.
6	Journal selection (for authors)	Based on experience or journal finder tools for a particular publisher.	By using semantic web technologies and inter-journal/publisher relationships, it is possible to provide help to authors in finding suitable journals for their work.
7	Replication of research	This is not possible unless authors publish raw data online or answer private requests.	Editors can demand that raw data be stored along with anything they publish. Readers then can determine if any subsequent data manipulation was warranted and in tune with ethical policies.

suggestions from the IS that will improve their decision capabilities. IS is a challenging field, so its use in journal management will not be simple even though it is necessary. Table 1 shows some current journal management systems and our suggestions as to how they could be improved by using IS facilities. Note that there are two ways that this could be done: 1) with each function being applied separately or 2) with all functions being integrated into a single IS. We favour the latter.

Current journal management systems support submission, but usually do not provide information for editors to help them in decision making. Instead of doing so many tasks manually, a JMS improved by IS will quickly provide the needed information in an acceptable format. Figure 1 shows the current JMSs structure. In this structure, each JMS has a separate database, workflow, and specific platforms. Each of these JMSs do not have a relationship with other JMSs. Publishers may integrate the database of their JMSs within their own organisation, but this does not take advantage of the worldwide utilities and databases now available in IS. Citation databases (such as Scopus or Web of Science) gather information from different journals to complete their data for bibliometric analysis. Usually, there is no link between these citation databases to JMSs, although some journals use these databases to show citation counts of their own papers.

Figure 2 shows our conceptual model for an optimum journal management system with the use of IS facilities. In this model, each journal/publisher uses a JMS that includes a known platform that conforms to the standards of the Journal Relationship Management Center (JRMC). Journals send only the information about reviewers, papers, researchers, and other valuable information to JRMC that fall within their copyright policies. Each journal uses its local database with the utilities that IS provides. When extra information is needed, it then is available through JRMC. Editors can select suitable reviewers, check the qualifications of researchers, and increase their decision capabilities by using IS and JRMC. By using JRMC, citation databases also will be improved because they will be able to reach data previously unavailable to them.

Conclusion

Establishing IS within journal management will not be easy. It needs more study and more attention. Nonetheless, the inclusion of IS will eliminate much duplication of effort and will be of great benefit to science. Currently, the literature contains little on the use of IS in journal management. It seems that IS remains forgotten as the ugly duckling in the current body of knowledge regarding JMS. It is time for researchers and editors to rethink JMS and improve it with IS.

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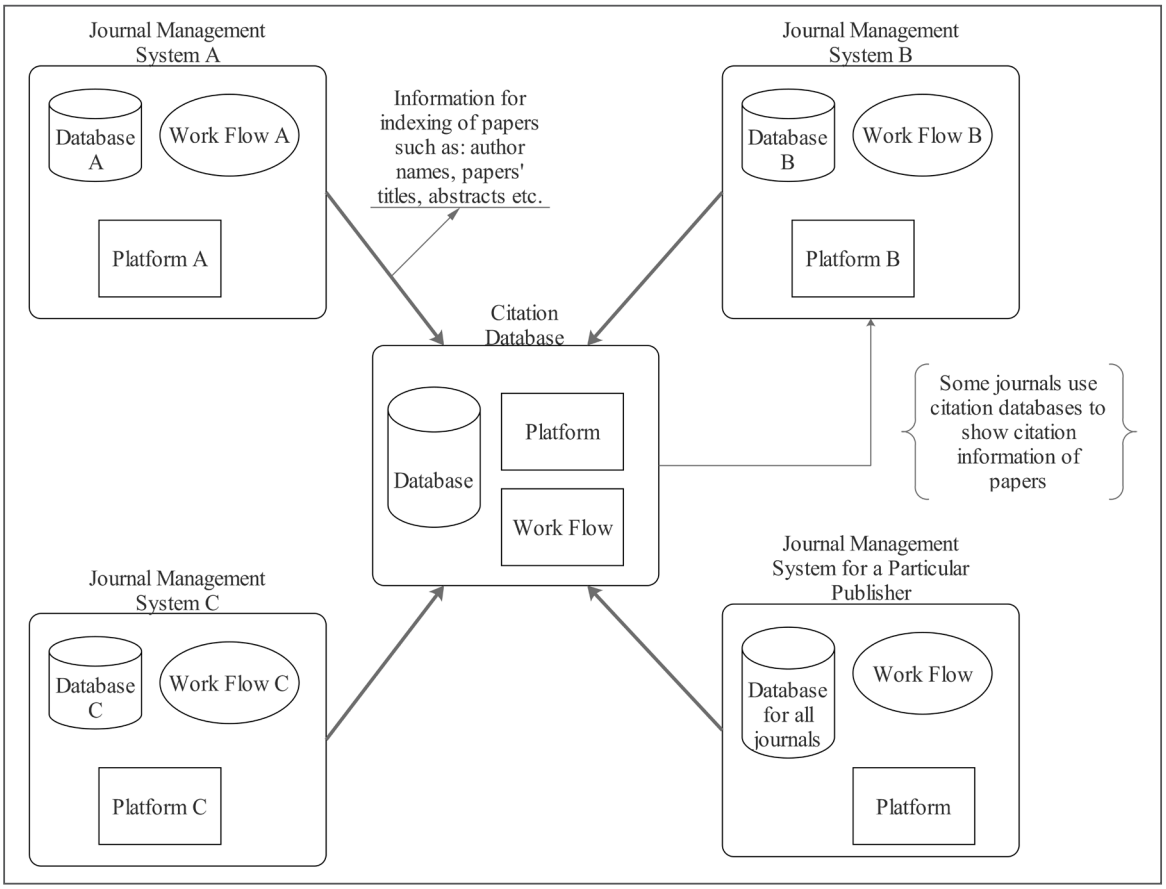

Figure 1. Current journal management system structure.

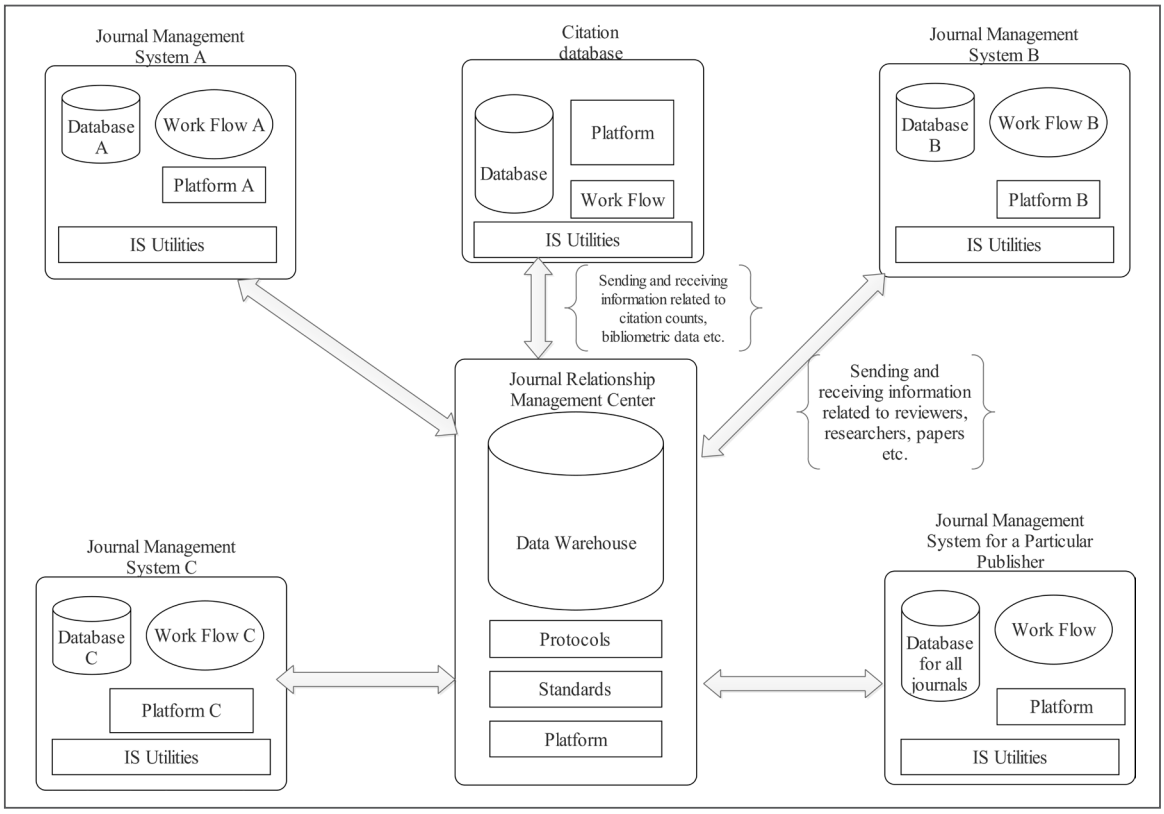

Figure 2. Optimum journal management system that uses IS facilities

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