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INTRODUCTION

Since the proposition by Eugene Garfield, in 1955, of a system to grade journals, the "Journal Impact Factor" has been widely used as a measure of quality and citations in science (Testa, 1998). The follow up was the establishment of the Institute of Scientific Information (ISI), which compiled a Science Citation Index (SCI), and finally the *Journal Citation Reports*® (JCR®) in 1975. Today *JCR*® presents statistical data to evaluate the world's leading journals and their impact in the global research community (Thomson Scientific, 2007). Marziale and Mendes (2002) define the impact factor of a journal as the ratio between numbers of citations by the total number of published articles in a period of two years. In the QUALIS CAPES, a Brazilian system that classifies scientific journals, several scientific committees include in their evaluation the *JCR*®. However, this situation is changing, especially with the increasing number of scientific journals worldwide, in particular, electronic journals published via Internet. Seglen (1997) pointed out many limitations of the "Journal Impact Factor". The editorial of Nature (Impact Factor, 2005) stated:

> Attempts to quantify the quality of science are always fraught with difficulty, and the journal impact factors are among the few numbers to persist. The result is an overemphasis of what is really a limited metric.

With the increasing availability of full texts, freely available, powered by searching tools on the Internet, many articles have the chance to be read and referenced. Thus the quality of the published articles can be judged by the readers rather than by an index that covers only few traditional journals. Even Thompson Scientific recognizes this change in editorial concept. From over 43,000 scholarly journals in print worldwide and a rapidly growing number of open access and electronic journals, Thomson Scientific has selected 8,700 journals as the most significant publications, covering the sciences, social sciences, and arts and humanities and is considering a continually shifting core of approximately 2,000 journals and also recognizes that Open Access data enhances their 'users' journal coverage. The Institute for Scientific Information (Philadelphia, USA) had, in 1974, only four Brazilian journals indexed and only 17 appeared in their list in 1999. This corresponds to 0.37% of all registered Brazilian scientific journals at that time, according to Targino e Garcia (2000). Marziale and Mendes (2002) discuss the impact factor of journals concerned with the health care science in Brazil.

Jafary e Jawaid (2007) raised some questions about how to calculate the 'impact factor' of journals and pointed out several flaws of current systems such as: "asking authors to add citations to previous articles from the same journals; journals with good 'impact factor' may reject studies submitted from less developed parts of the world but important papers, under the fear that such articles would not attract sufficient citation attention" and they suggested other ways to measure the quality of the journals, such as "PageRank algorithm" and "H-index":

> PageRank algorithm: it has been proposed by Bollen et al. (2006) to use PageRank algorithm used by Google to distinguish the quality of citations and hence improve Impact Factor. It is a modified system that combines the calculations made by ISI Impact Factor and PageRank. (Jafary; Jawaid, 2007)

To evaluate the individual impact, the Research in International and Cross-cultural Management developed the "*Publish or Perish*" (http://www.harzing. com/pop.htm) which is a software program that retrieves and analyzes academic citations. It uses Google Scholar to obtain the raw citations, then analyses these and presents the following statistics: Total number of papers; Total number of citations; Average number of citations per paper; Average number of citations per author; Average number of papers per author; Average number of citations per year; Hirsch's h-index and related parameters; Egghe's g-index; The contemporary h-index; The age-weighted citation rate; An analysis of the number of authors per paper.

Many authors stated that online journals, especially those with free, full text availability, facilitate access to the researchers and improve citation rates of articles. Jafary and Jawaid (2007) indicated that new tools, facilitating increased visibility of online journals, are now coming up and that research is needed to evaluate the Impact Factor and other measures of journals and articles' quality.

INCREASING VISIBILITY OF ARTICLES

It is quite impressive the visibility of online publishing compared to offline. Lawrence (2001) computed the percentage increase across 1,494 venues containing at least five offline and five online articles. Results shown an average of 336% more citations to online articles compared to offline articles published in the same venue. If articles published in the same venue are of similar quality, then they concluded that online articles are more highly cited because of their easier access.

Thomson Scientific, traditionally concerned with printed journals, announced on November 28, 2005, the launch of Web Citation Index™, the multidisciplinary citation index of scholarly content from institutional and subject-based repositories (http://scientific.thomson. com/press/2005/8298416/). The Web Citation Index from the abstracting and indexing (A&I) connects together pre-print articles, institutional repositories and open access (OA) journals (Chillingworth, 2005).

The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) provides an application-independent interoperability framework based on metadata harvesting (http://www.openarchives.org/OAI/openarchivesprotocol.html). There are two classes of participants in the OAI-PMH framework: "Data Providers" administer systems that support the OAI-PMH as a means of exposing metadata; and "Service Providers" use metadata harvested via the OAI-PMH as a basis for building value-added services. The OAI has its roots in an effort to enhance access to e-print archives as a means of increasing the availability of scholarly communication. The fundamental technological framework relevance is to broaden up access to a range of digital materials.

A repository is a network accessible server that can process OAI-PMH requests in standard manner. A repository is managed by a data provider to expose metadata to harvesters. A unique identifier unambiguously identifies an item within a repository. Many *Service Providers* are registered in OAI-PMH. Among them, there are several related to scholarly journals such as:

Avano, a marine and aquatic sciences OAI harvester, implemented by Bibliothèque La Pérouse; **BASE**: Bielefeld Academic Search Engine, implemented by Bielefeld University (http://www.basesearch.net/about_project_english.html); **Callima**, implemented by Infoball Callima as a search engine for scientific articles from various subject areas and sources; **CASSIR** (Cross Archive Search Services for Indian Repositories), implemented by National Centre for Science Information (NCSI), Indian Institute of Science, Bangalore; **citebaseSearch**, implemented by Southampton University that provides users with the facility for searching across multiple archives with results ranked according to many criteria, such as creation date and citation impact; **Clio-i** Service Provider of Science Documents implemented by Liber Laboratory, UFPE, Brazil collects information about science from OAI repositories; **DL-Harvest** implanted by the University of Arizona; **GEO-LEO**, implemented by Lower Saxony State and University Library Göttingen (SUB) and the University Library "Georgius Agricola" of the Technische Universitt Bergakademie Freiberg (UBF); **iCite**, implemented by iCite for indexing system covering physics journals; **OAIster** University of Michigan Libraries Digital Library (http://www.openarchives. org/service/listproviders.html); **Openarchives.eu**, implemented by Horizons Unlimited srl, Bologna, Italy, a section on "Digital Objects" allows metadata searching through a number of other service providers (**OAIster, arXiv, RePEc, CiteSeer, NCSTRL, PubMed Central, Pleiadi**); **Perseus**, implemented by Perseus; **SAIL-Eprints**, implemented by CNR - Area della Ricerca di Bologna; **ScientificCommons**, implemented by ScientificCommons; **Scirus**, implemented by Scirus to provide scientists with one comprehensive search platform covering both the web and the normally "invisible" databases.

FINAL REMARKS

Basically all research funds are government granted funds, tax payer's supported and therefore, results should be made freely available to the community. Free online availability facilitates access to research findings, maximizes interaction among research groups, and optimizes efforts and research funds efficiency. Therefore, Ambi-Água is committed to provide free access to its articles.

An important aspect of Ambi-Água is the publication and management system of this journal. It uses the Electronic System for Journal Publishing (SEER - http://www.ibict.br/secao.php?cat=SEER). This system was translated and customized by the Brazilian Institute for Science and Technology Information (IBICT) based on the software developed by the Public Knowledge Project (Open Journal Systems) of the British Columbia University (http://pkp.sfu.ca/ojs/). The big advantage of using this system is that it is compatible with the OAI-PMH protocol for metadata harvesting what greatly promotes published articles visibility. Currently, there are 687 conformably registered repositories in OAI. The Public Knowledge Project – Open Archives Harvester2. lists Ambi-Água: http://pkp.sfu.ca/harvester2/demo/index.php/browse/ index/677. At the OAI base the URL of Ambi-Água is http://www.agro.unitau.br/ seer/index.php/ambi-agua/oai?verb=Identify. Therefore, all *Service Providers* are automatically capable of harvesting metadata from Ambi-Água articles.

In addition to requesting attention from the OAI-PMH *Service Providers*, the Editorial Board of Ambi-Água is seeking indexing in several other data bases. Many of them have quality assessment before incorporating a journal in their bases. Therefore, it may take sometime before Ambi-Água is actually listed in such bases. Up to present the following indexing bases have been contacted: Directory of Open Access Journals (DAOJ - http://www.doaj.org); SCOPUS (http://info.scopus.com/detail/facts/); ROAR; LANIC;

OAISTER; RoMEO; PKP; OAI-PMH; LivRe, Web Citation Index™ and Latindex. In addition, all coordinators of QUALIS CAPES representatives of committees related to Ambi-Água themes have been contacted. Several indexing bases already accepted to include Ambi-Água. A continuously list of these bases will be updated in the news section of the journal.

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