

Informetric evaluation of *Bulletin EBIB*

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Abstract:

Purpose of this paper is to present research results on informetric evaluation of electronic journal performed in 2009. Informetric approach aspires to be the most complete evaluation method of electronic information resources, because it reveals impact of the certain source in various aspects. Not only the influence on sciences' development and scholars' society can be measured, but also wider public may be taken under consideration. Informetric evaluation is based on different (bibliometric, webometric and usage) kind of tools and data in every stage of its application. The base of the method is to put the information source in an appropriate context by providing it's detailed characteristic (including data on editors, policy, funding etc.). The research on Bulletin EBIB (polish e-journal on librarianship) provided rich information on its' influence and value for public in printed and virtual world. The paper also contains comments on the advantages, disadvantages, limitations, challenges and application of informetric approach to evaluation research.

Introduction

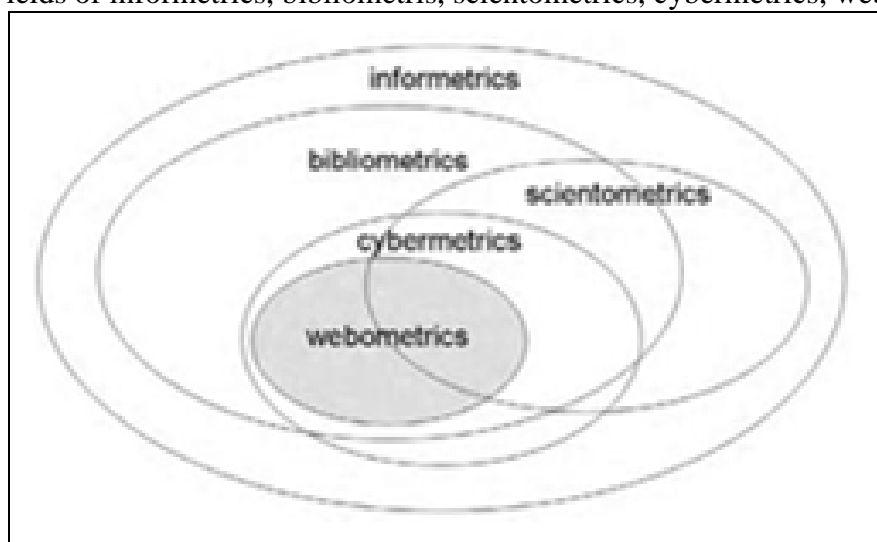
Quantitative research concerning quality measurement of printed publications reach XVIII century. The first work of the kind was based on the comparative analysis of books' catalogues aimed to reveal size, languages and subject structure of the printed production. In 1922 statistical bibliography and later on 1969 a field of bibliometrics was defined (Skalska-Zlat 2002, 16).

A milestone in defining bibliometric quality indicators for scientific journals was erection of Institute for Scientific Information by E. Garfield (2007 and 1979) in 1960'. Its' main work was Science Citation Index, which registered citation and included Journal Impact Factor (JIF). Since then the indicator has been used to rank journals in order to identify significant and most influential publications, provide collection policy for libraries, funding policy for certain countries and to reveal trends in science. The journal impact factor was also used to measure electronic journals impact (Harter 1996).

However development of Internet and World Wide Web in last decades effected emerging of the study of quantitative aspects of the construction and use of information sources, structures and technologies on the whole new environment (cybermetrics) or Web (webometrics) (Bjorneborn 2004, 13) already in 1990'. Research focused on the comprehension of value of JIF and Web Impact Factor (WIF- the main indicator of webometrics) were conducted by A.G. Smith in 1999. The work has proved significant correlation between the indicators.

Moreover in the beginning of the XXI century studies based on usage data of articles stored in repositories began. Bollen and Sompel (2007) defined Usage Impact Factor, which might be a significant supplement of JIF and WIF in qualitative approach to electronic journals quality. Research conducted by the author of the paper is based on the compilation of indicators, which use bibliometric, webometric and usage data. Therefore it stays in the field of informetrics, which according to Bjorneborn (2004) concerns every kind of information possible.

Fig. 1. Fields of informetrics, bibliometrics, scientometrics, cybermetrics, webometrics



(Bjorneborn 2004)

Informetric analysis

Informetric analysis was defined for the research as the quantitative quality studies of electronic journal based on comprehension and analysis of bibliometric, webometric and usage impact factors. It consists of following stages:

1. Research material selection.
2. Characteristics of the selected electronic journal.
3. Bibliometric data acquirement:
 - a. Creation of bibliographic database.
 - b. Calculation of selected bibliometric impact factors.
4. Webometric data acquirement:
 - a. Selection of tools to acquire webometric data.
 - b. Calculation of selected webometric indicators.
5. Usage data acquirement:
 - a. Selection of tools to acquire usage data.
 - b. Calculation of selected usage indicators based on available data.
6. Comprehension and analysis of all indicators' value

Research material

An author decided to use as a research material electronic journal, which fulfill following criteria: covering information science and librarianship (LIS), national reach, at least a few

years published, high number of citation registered in certain database. So the journal fulfilling all the criteria above was *Bulletin EBIB* (www.ebib.info/biuletyn).

The main issue of the research was that the only database, which includes citation from polish journals in the field of LIS (CYTBIN –www1.bg.us.edu.pl/bazy/cytbin/) doesn't cover necessary time period. Therefore creation of new database was essential. The database was created as a Microsoft Access file. It covered citation of periodicals from four most important polish LIS journals, these are: *Bibliotekarz*, *Przegląd Biblioteczny* (PB), *Bulletin EBIB*, *Zagadnienia Informacji Naukowej* (ZIN). The sources of citations were articles published in 2008.

Bulletin EBIB

Bulletin EBIB is a part of web information service for librarians, which was founded in 1998. The electronic journal was first published in 1998 and continued monthly till today (112 volumes). Bulletin is based on Open Access model, and it is has registered in Directory of Open Access Journals (DOAJ) since 2003. Moreover since 2008 it has adopted Creative Commons license. Members of editorial board and most of the authors work in libraries (Małecka, Pietroń 2008) and are seen as professionals in their community. Every item is devoted to some certain topic related to LIS, e.g. digitalization, information literacy, etc. Editors of each item are rotating. The sections of the *Bulletin...* are following:

- Articles.
- Research, theory, views.
- Conference reports.
- Interviews.
- News reports.
- Law and other.
- Reviews.

Leading topic of items published in three years (from 2006-2008) were mostly about technologies in librarianship (e.g. digitalization, electronic resources, e-publications) or libraries organization (collection policy). Other items were devoted to up-to-date issues like, e.g. Open Access, publishing industry, readership, stereotypes in LIS, LIS students.

Next to the periodical portal EBIB consists of other content useful for LIS professionals, like: Publications (especially post-conference material), News (recent events related to LIS), Libraries (a collection of contact information about polish libraries) or services of Polish Library Association (Stowarzyszenie Bibliotekarzy Polskich).

Bulletin EBIB has been published for ten years. Editorial board consists of librarians and information professionals, who share their passion. Their work is voluntary and all the articles are provided online free of charge.

Bibliometric evaluation

The data concerning citations of *Bulletin EBIB* in four polish leading periodicals in LIS in two-year period of time were extracted from the database. They are sufficient to calculate JIF 2008 for the electronic journal (see below). The indicator's value for Bulletin EBIB is 0.14.

Fig.2. Journal Impact Factor calculations' example

Journal Impact Factor ⓘ			
Cites in 2003 to articles published in:	2002 = 34	Number of articles published in:	2002 = 27
	2001 = 56		2001 = 29
	Sum: 90		Sum: 56
Calculation: Cites to recent articles	90	=	1.607
Number of recent articles	56		

(Journal Citation Reports 2005)

The value of JIF 2008 (0.14) in comprehension to JIF 2005 (according to Thomson Reuters) of ten worldwide journals with the highest impact factor (from 4.98 to 1.41) is much lower. However the medium value of the IF 2005 for all polish publications included in Thomson Reuters databases reached 1.45. In that case the difference between *EBIB's* IF and polish publications' IF is still huge, but 1.31 lower then calculated for countries. Nevertheless none of the polish articles indexed in the databases concerns LIS. Therefore IF values, based on data available in author's citation database, for other polish periodicals (*PB*, *ZIN*, *Bibliotekarz*) were calculated. It shows that impact factors for the selected journals were similar (*EBIB* 0.14, *ZIN* 0.11, *PB* 0.08, *Bibliotekarz* 0.03).

Another important issue is a per cent of self-citation in the periodicals, because it may significantly lower impact factor's value. The size of self citation in the journals - *Bibliotekarz* 4%, *EBIB* 6%, *PB* 4%, *ZIN* 1% - shows that author's writing for *EBIB* has been citing the periodical most often.

How topical and urgent are the articles in *EBIB* (in comprehension to other polish journals)? Answer to this question requires values of Immediacy Index (II), which is calculated by dividing the number of current citations to articles published in the same year by the number of articles published in the current year (Nowak 2006). The II 2008 for *EBIB* is the highest (0.034), what means that it's articles are being cited already in the same year, they were published.

Bulletin EBIB 2008 has a high impact to polish LIS, but it also has high number of self citation. Nevertheless articles concerns urgent topics.

Webometric evaluation

Webometric evaluation is based on a number of sites linking to any article published in *Bulletin EBIB*. However there are some issues that needs to be addressed. First of all, there is no such tool, which allows to separate links to portal *EBIB* from Internet citation to *Bulletin EBIB*. The reason for this is that search engines allowing to collect such data do not allow to retrieve number of linking to sub-domains. Therefore it is not possible to find number of sites linking to *EBIB* services separately. Moreover it is impossible to indentify number of online citations to sites created in certain period of time. So data on linking to *Bulletin...* items published in 2008 only are not available. Therefore value of webometric indicators (Noruzi 2006) – Web Impact Factor (WIF) and Revised-WIF (R-WIF) - shows the number of linking to *ebib.info* or *www.ebib.info* registered on the certain date. Calculation formula for both factors has been presented below.

Fig.3. Web Impact Factor and Revised-Web Impact Factor calculations formula

<p>WIF= A/D = Web Impact Factor</p> <p>R-WIF= revised WIF (B / D)</p> <p>A= total links to a web site (all inlink and self-link pages)</p> <p>B= inlinks to the web site (this is a subset of A)</p> <p>C= self-links and navigational links within the same web site</p> <p>D= number of web pages published in the web site which are indexed by the search engine, not all web pages available in the web site</p>

(Noruzi 2006)

Data necessary to calculate values of WIF and R-WIF has been collected using AltaVista and Yahoo! Site Explorer. Both search engines allow to extract in-links and self-links to certain WebPages. According to those WIFs for EBIB are: 3.1 (AltaVista) and 3.6 (Yahoo!). R-WIFs values reach 2.2 (AltaVista) and 2.8 (Yahoo!). Therefore EBIB is visible on the Internet and there is also some number of self-links. Webometric research of Iranian universities' web pages carried out by Noruzi (2005) showed that WIF of those pages is between 4.60 to 1.89 and R-WIF from 4.27-1.84. In comprehension to the values of the factors EBIB's indicators' values are quite high.

Using some certain search option it was possible to identify languages' and domains of web sites linking to EBIB other than ebib.info. Most of them is in polish, but we can also find those in English, Slovak, German and French. Many of the in-links for EBIB came from libraries, Polish Ministry of Science and Higher Education. A lower number of Internet citation has been given by Polish Book Institute, universities, Wikipedia and blogs.

Bulletin... has quite high values of webometric factors. Most in-links comes form polish web site, but it is also visible internationally. Moreover high number of internet citation given by web sites' of institutions dealing books shows, that it is seen as valuable in the professional community.

Usage Evaluation

The main source of the usage data of EBIB are statistics published in articles, electronic publication on EBIB's 10th anniversary, as well as alexa.com. These information can be used to calculate Usage Impact Factor (UIF) – see below – of *Bulletin...* concerning only year 2001.

Fig.4. Usage Impact Factor calculations formula

$UIF_j^y = \frac{R^y(A_j^{y-1} \cup A_j^{y-2})}{ A_j^{y-1} \cup A_j^{y-2} } \quad (2)$ <p>where $R^y(A_j^{y-1} \cup A_j^{y-2})$ is the number of uses recorded in Year y of articles published in Journal j in the proceeding 2 years $y-1$ and $y-2$, and $A_j^{y-1} \cup A_j^{y-2}$ is the number of articles published by Journal j in the proceeding 2 years $y-1$ and $y-2$.</p>

(Bollen, Sompel 2007)

According to the data mentioned above UIF 2001 for Bulletin EBIB is 155, what means that a single article was visited average 155 times in the period of time. The number of visits was growing significantly till 2006 for about 75%. Therefore it is also possible that UIF 2006 was 75% higher than UIF 2001. From 2007-2009 there has been a small fall in the number of visits.

During March-May 2009 60% of users visited only one page of EBIB, 20% of users came from search engines, average time of visit is 1.7 minutes, daily pageviews per user is 2.7. Therefore at least 40% of users were interested in information published in EBIB, because they did not stop at single page view.

Conclusions

Readers of *Bulletin EBIB* came from different parts of Poland, but it is not being read widely in other countries. It is more visible (high WIF) on the Internet than other Polish LIS journals. That may happen, because it is the only electronic Polish periodical in the field taken under consideration during the research. Editorial board consists of working librarians and information specialists, what may affect good quality of articles published in the *Bulletin...* Moreover it is based on modern models of publishing – Open Access, Creative Commons – what may cause fast growth in number of readers. The fall of number of readers in 2007 and growth of time spent on the single web page of EBIB on user bear testimony to stabilization of size its regular readers. Articles published in the journal are urgent and topical, because they are being commented almost immediately (II). High JIF and in-links from institutions dealing with books proves that *Bulletin EBIB* has a significant impact on Polish LIS field.

References

1. **Björneborn, L. 2004.** *Small-world link structures across an academic web space : a library and information science approach* [Online], <http://vip.db.dk/lb/phd/phd-thesis.pdf>.
2. **Bollen, J., Sompel H., van de. 2007.** *Usage Impact Factor: the effects of sample characteristics on usage-based impact metrics.* *Journal of the American Society for Information Science and technology* 2007, vol. 59 no 1, s. 136-149.
3. **Garfield, E. 1979.** *Scientometrics comes of age* [Online]. *Essays of an Information Scientist*, vol. 4 1979-1980, s.313-318, <http://www.garfield.library.upenn.edu/essays/v4p313y1979-80.pdf>.
4. **Garfield, E. 2007.** *From the science of science to scientometrics: visualizing the history of science with HistCite software* [Online]. In: Proceedings of ISSI 2007, June 25-27. 11th International Conference of the International Society for Scientometrics and Informetrics, CSIC, Madrid, Spain. vol. 1, s.21-26, <http://garfield.library.upenn.edu/papers/issiprocv1p21y2007.pdf>.
5. **Harter, S. P. 1996.** *The Impact of Electronic Journals on Scholarly Communication: A Citation Analysis.* *The Public-Access Computer Systems Review* 7, no. 5.
6. **Journal Citation Reports. 2005.** [Online]. The Thomson Corporation, 2005, http://scientific.thomsonreuters.com/media/scpdf/jcr4_sem_0305.pdf.
7. **Journals ranked by impact: Information Science & Library Science. 2006.** [Online]. The Thomson Corporation, 2006, http://in-cites.com/research/2006/november_6_2006-2.html.

8. **Małecka, E., Pietroń, J. 2008.** *Kto publikuje w EBIBie? Biuletyn EBIB* [Online] 2008, no 100, http://www.ebib.info/2008/100/a.php?malecka_pietron.
9. **Noruzi, A. 2005.** *Web Impact Factor for Iranian Univerisites* [Online]. *Webology* 2005, no 2(1) , http://dlist.sir.arizona.edu/1456/01/Web_Impact_Factors_for_Iranian_Universities.pdf.
10. **Noruzi, A. 2006.** *The Web Impact Factor: critical rewiev* [Online]. *The electronic library* 2006, 24 (4), s. 490-500, <http://eprints.rclis.org/archive/00005543/>.
11. **Nowak, P. 2006.** *Bibliometria, webometria, podstawy, wybrane zastosowania*. Poznań : Wydawnictwo Naukowe Uniwersytetu im. A. Mickiewicza, 2006.
12. **Science in Poland 2001-5. 2007.** [Online]. The Thomson Corporation, 2007, http://in-cites.com/research/2007/april_16_2007-2.html.
13. **Skalska-Zlat, M. 2002.** *Bibliografia w Polsce 1945-1996, naukoznawcza analiza dyscypliny*. Wrocław : Wydawnictwo Uniwersytetu Wrocławskiego, 2002.
14. **Smith, A. 1999.** *ANZAC webometrics: exploring Australasia and Web structures* [Online]. In: proceedings of Information Online and On Disc 99, Sydney, 19-21 January 1999, <http://conferences.alia.org.au/Online1999/proceedings99/203b.html>.