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New application of bibliometrics

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Abstract

This article presents the potential of bibliometrics as a more functional practice in public libraries. Bibliometrics laws and models are seen as a way of redefining and widening of the role of the library. The news applications of bibliometrics in library practice is motivated by ambitions to provide more complete services in public libraries, as well as to increase the visibility and status of libraries, not the least in relation to good management. The usage of Bibliometrics in public libraries is also seen as a way of widening of the professional profile of librarianship. The new applications should, however, also be considered from the viewpoint of potential changes in how libraries are perceived when using a monitoring function through bibliometric analyses of research performance in addition to traditional service oriented functions.

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1. Introduction

The main idea is to apply the bibliometric law not only for document's studying but for studying reader's interest and needs.

As we know there are some fundamental bibliometrics laws as: Bradford, Lotka, Zipf, Hirsh.

I'm developing my idea examining the application of cited laws one by one.

2. Discussion

2.1. Bradford Law

Bradford law is very popular and the most well known law. For that I'm begging with this law. Bradford's law of scattering (of subjects in information sources), first published in 1934, is often mentioned together with Zipf's

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law (about word frequencies in natural language texts) and Lotka's law (about distribution of authors' productivity) as one among the three most important bibliometric laws, and is often considered the best model or example of scientific research that is available within Library and Information Science (LIS).

If readers or users are arranged in order of decreasing search of articles on a given subject, they may be divided into a nucleus of readers more particularly devoted to the subject and several groups or zones containing the same number of readers as the nucleus, when the numbers of readers in the nucleus and succeeding zones will be as 1:n:n2. A core of readers on given subject, relatively few in number, that consists approximately one-third of all the publications, 2) a second zone, containing the same number of readers as the first, but a greater number of publications, and 3) a third zone, containing the same number of articles as the second, but a still greater number of readers. The most used publications have been determined by means of these zones of readers because these journals are necessary for the regular library users.

Russian scientist Alekseev proposes in conditions of financial crisis the following decision - to complete library fund not with the maximum searching journals, but with the journals with minimal cost. This minimal cost has been determined as cost of the given annual complete series divided of its use during the year. All journals have been ranged by the accumulation of this indicator. Bradford law can be applied in this distribution but the number of journals is replaced with their total cost [1].

Bradford's law has been used as an argument about how to build collections, how to select journals to be indexed in bibliographies, how to measure the coverage of bibliographies, how to solve practical problems related to information seeking and retrieval, and by Bradford himself as an argument for a new way to organize bibliographical work and documentation.

Nisonger [2] argues in his textbook Management of Serials in Libraries that the following points are some of the “most obvious potentials” of Bradford analyses:

- Selection/deselection;
- Defining the core;
- Collection evaluation;
- The law of diminishing returns;
- Calculation of cost at various coverage;
- Setting priorities among journals.

Thus, there are at least three different kinds of scattering:

- Lexical scattering is the scattering of words in texts and in collections of texts.
- Semantic scattering is the scattering of concepts in texts and in collections of texts.
- Subject scattering is the scattering of items useful to a given task or problem [3].

Library slatistics as the application of mathematical-statistical methods in librarianship comprises also manifold possibilities for planning requirements (e.g. quantitative and qualitative development of the use made of the library), capacity planning (e.g., staff, material-technical basis, funds) and cost profit investigations (e.g. ratio bookstock: students). This is supplemented by statistical methods in library organization (e.g. internal processes) and the standardization of various operations (e.g. duration of processing). Thus, the oldest mathematical-statistical method in librarianship proves indispensable, especially for decision finding by, the head librarian.

There are, mainly, applied descriptive and illustrative statistics but also variance analysis, factor analysis, parameter-free statistics and multivariant analysis. Moreover, library statistics is connected with the methods of operations research.

For the building of areal bookstock and the supply of this stock bibliometrics is an almost ideal field of activity because its proper purpose - the measurement of the documents used for recording and communicating scientific

knowledge - here becomes distinctly visible. This concerns particularly the acquisition of books and periodicals: analysis of the use made of the library, analyses of citations from primary and secondary literature, analyses of reviews, analysis of inter-library lending using books and periodicals: analyses of citations from primary and secondary literature, analysis of attendance of library ratio of acquisition to lending: citation analysis of primary and secondary literature duration of storing books including second-hand acquisition of books: citation analyses.

2.2. Pareto's Principle or Pareto's Law

The Pareto Principle could be used in Libraries in the following aspects: the management work of the library, the booking job, the construction of article and document resources, personal services and the collection of articles and documents. It can be helpful in document storage and in the reader service.

Particularly in the construction of literature and resource, its application will help adjust the physical collection structure, rationally allocate the information resources of various documents, and realize the value increment of key information resources. The use of "Pareto Principle" will inject new vitality into the library work, making it more efficient [4,5].

The application of Pareto Principle could be do with bigger depth studying the different users. Library users may be individual readers, collective subscribers as scientific public library at so on.

When we look for optimal subscription the right thing to answer to following questions: which is the percent of readers which are 80% of common numbers of information search? What part of readers realizes 80% of the common search of documents?

For the optimal subscription it is important to know: Are there 80 % of all number of users who search given information resources. The evaluation of the quality of library activities uses indicators "common use" and "density of use" . It means that we take the ratio of the search towards the continuity of the using document [6].

2.3. Hirsh index

If the pair "resource – result" has been changed with "article- citation" or "article- reading" the Hirch approach could be applicable in the process of the use of the documents. In this case h resources (journals), which have no less than h articles became especially important. H-index gives account these articles. They make «h-core». Properly speaking the rest of journals could not have been read.

H-index is a tool for evaluating the core of reader search [7].

2.4. Leimkuhler Law

Leimkuhler's law could be used in the study of readers needs, productivity and price of journals. This study gives information about the selection of documents. This law effectively helps librarians in the field of getting out a book and copying activities.

2.5. Lotka law

The invariability of Lotka law in lot of fields enables its application for the dissemination of the productivity of given information groups of authors. It is very important for the libraries to know the most prolific authors and to supply the library with their publications.

2.6. Zipf law

The application of Zipf law in the document search could be possible by means of the change of pair "resources-results (journals)". The number of the journal from the list of searching journals, ranged by decreasing of the number of their search will be in the place of the word rank. We will use number of full text articles in the place of word frequency.

2.7. Gorkova law

Average publication growth as an indicator is very important for the library supplying. The Gorkova [8] regularity of the publication growth gives the possibilities to examine the dynamics of the changes in documentary flows. This regularity is a good tool for the arranging of the documentary resources in library depository at least.

Gorkova proposes the following formula:

$$V = \Delta N / N * \Delta t,$$

Where N – number of publications in the basic year;

ΔN - growth for period Δt;

V – speed of the publications growth, determined by their growth (ΔN) for time Δt in the relation to basic year (N).

Gorkova law can be used in the study of the dynamic of document flow.

3. Conclusion

The application of bibliometrics may make better the users service thanks to mobile reaction of the varied readers needs. Therefore the library technologies could be changed on the basis of bibliomertics analysis.

The realization of user's requests involves a lot of activities such as:

- Study of the information search, revealing of its content, establishment of favorite services;
- Formation and stimulation of information search, its development if there is readers inertness or episodic of the use of library services;
- Determination of the number and the structure of reader's groups;
- Regulation and if it is necessary change of the nomenclature and the content of the services.

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