Discipline Impact Factor: its History and the Continuing Reasons for its Use

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Impact factor

In the article, which first introduced the word combination "impact factor" (Garfield, 1955), "impact factor" was still a full synonym of the word "impact", and it did *not* relate to journal evaluation, as it happened much later (Bensman, 2007, p. 111): "Garfield <…> was to change this meaning when he created a measure he called the "impact factor" to determine which journals should be covered by the *SCI.* This term came to be defined as *the average number of citations to the papers of a given journal*". According to E. Garfield's definition, "this impact factor is the mean number of citations to a journal's articles by papers subsequently published. It is determined by dividing the number of times a journal is cited (R) by the number of source articles (S) it has published" (Garfield, 1970, p. 5).

Discipline impact factor

The classical Garfield impact factor reflects the level of the use of an average paper of a certain journal *by all the journals representing technical and natural sciences* (being indexed by the Science Citation Index; later–by Web of Science). However, I believe that in order to organize a sufficient information service, it is much more important to know the level of use of an average paper of a certain journal (or of other serial) *not by all the journals* representing technical and natural sciences *in toto* (as reflected in the classical impact factor), but by the ones *specialized in that concrete discipline or a field of research* which is going to receive information services. After all, the provision of information services to specialists in a particular field of research is the task of a larger number of libraries than the information support of all natural and technical sciences "in general".

In this regard, it is appropriate to recall that in the 70-ies years of the 20th Century Graeme Hirst introduced the so-called "discipline impact factor" (Hirst and Talent, 1977; Hirst, 1978). As Hirst (1978, p. 171) stated, "the discipline impact factor (DIF) is similar to the impact factor <…>, which measures the average number of times a paper in a given journal is cited, except that the DIF measures the number of times a paper in a journal is cited in the core literature of the given discipline". I think this formulation is not a brilliant one because, in fact, the *specialized* journals (not the "core"

journals) are implied to be the sources of citations in the study by Hirst and Talent (1977), and the term "*discipline* impact factor" itself implies the count of citations in *specialized* journals. For some disciplines among core journals there are journals of much wider specialization that the discipline itself. It is obvious that using them as a source of citations would result in involvement of citations that are *not* related to the discipline in question.

Since DIF was aimed at solving practical problems, relevant at that time for each research, university and college library, it should have been expected that it would become very much popular, would be used very frequently. However, it never happened. In fact, it was used surprisingly seldom. Apparently, this was due to the fact that the calculating of DIF required quite time-consuming computations, while the "classic" impact factor was presented in Science Citation Index in a ready form. Several papers, however, might be mentioned as specimens of the discipline impact factor use for determining appropriate lists of periodicals (e.g. Lazarev and Nikolaichik, 1979; Gould, 1981; Black, 1983; Lazarev, 1983; Kushkowski et al. 1998; Lazarev et al., 2017 etc.). There are also some papers in which just some minor elements of the Hirst's methodology were used relating to the restricted number of "core journals" selection, but not to the application of DIF itself for determining extensive lists of necessary periodicals. The example is the paper by Jan and Zhu (2015).

Our experience of DIF application for serials evaluation of selections (Lazarev, 1983; Lazarev and Skalaban 2016; Lazarev et al., 2017; Lazarev et al., 2019 etc.) demonstrated that quite a substantial portion of journals that are being included in the list of serials to be determined in order to organize or amend information services of the specialists in a certain discipline or research field is being selected *exclusively* by means of DIF computation.

Do we still need it?

One of my papers was rejected by a reputed journal, whose editor wrote me that nowadays libraries buy access to huge databases (packages) and do not bother to determine the "best" journals, while it is much cheaper to buy the whole package than to buy separate journals.

Nowadays libraries really *mostly* buy access to huge databases (packages) and *do not bother* to

determine the concrete necessary journals and other serials. And as bibliometric evaluation and selection of non-profile serials to be used by researchers *in a specific discipline* were usually performed exactly in order to select serials for the specialized library stock, there *seeme*d to be no more need in bibliometric evaluation of the non-profile serials value for researchers in a specific discipline (Lazarev 1998).

However, the following question still arises: "*Which* databases (packages) ought to be purchased? The answer might seem easy to a librarian who lives in a country where a regular *sufficient* financial support of university and research libraries is practiced. But in case of restricted, meager financing for database subscriptions, we are to spend our small money for sure. The point is we need to choose exactly the databases ("subscription packages") *with the best coverage of the relevant serials*, the databases (packages) that optimally meet *both* the requirements of containing more useful periodicals and of being cheapest to be purchased. As many as possible relevant periodicals ought to be accessed via these databases (packages) at the lowest financial cost. In order to arrange this, one is to check each "subscription package" for the presence of maximum number of necessary serials. In its turn, in order to fulfill the latter, one is to know concretely *which* periodicals are needed! And therefore, one is to start the procedure that is very much similar to the one that was practiced in the past for the selection periodicals immediately for acquisition to the library stock! (As for the Open Access journals, thought they *are* available, they ought to be identified as well!) So, we, librarians from the countries that cannot afford sufficient financial support of academic, university and research libraries, still *do* need in determining "best" journals and in good instruments for it. One of such efficient tools is the discipline impact factor.

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