

NOTION OF A DOCUMENT: A CENTER OF "GRAVITY ATTRACTION" FOR GETTING METRICIANS TOGETHER*

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I agree with *Glänzel* and *Schoepflin* when they mention that bibliometrics, scientometrics and informetrics are drifting apart. Moreover, I believe, that "drifting apart" is the main cause of the most of the other symptoms of the crisis mentioned by *Glänzel* and *Schoepflin*. In fact, having separated themselves from each other, the subdomains of metricians could not be so effective in their activity: the lack of integrating personalities and the absence of the *generalized* notion of the field in the recent handbooks seem to be rather a consequence of the mentioned tendency, but not separate causes of the crisis since there are plenty of persons who are able to integrate the recent knowledge obtained in the subfields – but they have to have a good will to do it. I also think, that "lack of consensus in fundamental questions" mentioned by *Glänzel* and *Schoepflin* is not only the reason for negative image of scientometric research, but, first of all, a consequence of drifting apart of metricians resulting in the lack of apprehension of the notions that might be adopted by one subfield from another. That is why the above observation seems to be true also for bibliometricians and informetricians, being, therefore, a reason for similar impression of corresponding research. This negative image, in its turn, may be quite a sufficient reason for losing financial support for investigations to be done for scientific disciplines, science policy and business.

I agree with most of the proposals noted by *Glänzel* and *Schoepflin*. But if we are going to search for the principal remedy, it seems reasonable to concentrate our endeavors on overcoming the casual symptom. I think that for getting metricians together we should first just answer the following question "Are the borderlines

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between the three subfields so insuppressible that it is not possible to create a meta-theoretical platform for their further *collaborative* development?*

In order to detect the degree of similarity of essentials of the three subfields it is necessary to consider their objects, subjects and methods. A subject of any of them is reproducible quantitative characteristics of the corresponding object,¹ therefore it is enough to consider the objects and methods.

Object

Bibliometrics is generally believed to deal with quantitative studies of documents, collections of them and their elements. According to the initial definition of *Prichard* it is application of mathematics and statistical methods to books and other media of communication.³ So, a document** – any material carrier of fixed information – is an object of bibliometrics.

It is important to note that, that some scientists believe that the object consists of *all kinds* of documents, but not only scientific ones and that some bibliometric studies of non-scientific document are fulfilled.

Some people believe that an object of bibliometrics is a document plus a networks of libraries.² But since a library (as the most general notion) is a complex of a document, a reader, a librarian and technical facilities,⁴ all links between these elements (i.e. all library processes) occur to be included in the object of bibliometrics; the draft generalized notion of the latter would be "a document plus *some document-related substances attributed to the notion of a library*". Such a notion absolutely corresponds to the notion of general objective of bibliometrics as "perfection of a library activity".² If we did not take the objective into consideration, there would be hardly something other than a document in the object of bibliometrics.

I believe that *Egghe*⁵ is right when he extends the object of bibliometrics by including in it correspondent document-related substances attributed also to archives, media centers etc. (practically – all possible institutions of social communications), since the principal structure of the latter would be similar to the structure of a library. These substances are considered as relations with a potential user and a term

* The notion of informetrics as a meta-discipline is not very much sufficient since some people believe that it is a separate discipline and due to some other reasons mentioned below.

** In the following a term *document* is used synonymously for *documents elements* (including references and citations, which are both elements, links and reflections of documents) and *collections of documents*.

"document" is not used, but, in fact, files recorded on floppy-disks, pictures, records, note-books of scientists with mathematical symbols etc. are documents. No metricians are able to study the information in non-documentary form; thus, if it is an oral speech it must be recorded at least at a tape (which is already a document).

The object of *scientometrics* is any quantitative indicator of scientific activity. It is true, that besides scientific documents studied in relation with their potential user (and creator as well; these two notions are integrally joint in science in one notion "scientist"), scientometricians study also such things as number of scientists, availability of grants and technical facilities and some other substances that are very close to the notion of a document: co-authorship, collaboration (documentary reflected in joint projects or some other documents of this kind).

What is important here is, first, that a scientific document is the only first immediately measurable and visible result of scientific activity, which is itself a kind and a means of new information obtaining and, therefore, a kind and a means of scientific documents production. The most of scientometric studies are studies of documents.

Second, "the rest" of the object are some scientific document-related substances attributed to the notion of science just corresponding to the general objective of scientometrics – "perfection of scientific activity".¹ What might not be directly a document in the object is just determined by the objective. *Egghe*⁵ says that scientometrics studies interrelationships between users and scientific collaboration; that means that an object is a document viewed in relation to its usage and creation i.e. just in the context of science activity. This relation, caused by an objective, includes automatically in the object of scientometrics such "unexpected" substances such as, for instance, a scientist himself (as a document user and producer).

Finally, some methods of quantitative studies of science that are regarded as scientometric may be referred to sociometrics, econometrics etc. more definitely⁵ and hardly seem to be specific for our domain.

The object of *informetrics* (treated as an independent subfield) is scientific information and scientific communication.¹ Besides scientific communication (that can be regarded just as one more institution of social communications and hence this part of the object might pass to the extensively viewed notion of bibliometrics), scientific information itself may be studied only in a documentary form: the linguistic aids mentioned as a part of the object by *Gorkova*¹ and the electronic forms of information mentioned by *Brookes*⁶ are undoubtedly documents: artificial languages used for information retrieval do not primarily exist in a non-documentary form,

whereas the "electronic forms" of the information are "not" documents only when are being transmitted, but they are documents when they are created or used irrespectively of the form of material carrier. Besides, scientific information is insufficiently used in a non-documentary form (the informal contacts between scientists become effective when at least some notes in their note-books appear).

So, we can say that the object of informetrics is a scientific document plus scientific communication, and this means that the object is a scientific document plus the means of their dissemination. In its turn, it can be interpreted as a scientific document in relation of a potential user. Unless we do not take into account the formulation of the objective of informetrics ("perfection of scientific information activity"¹) the only possible difference between bibliometrics and informetrics objects is that the second object is more narrow. Some people also think that not only scientific, but any kind of social information is included in informetrics object. If so, the objects are the same (and we should bear in mind the term "bibliometrics" appeared earlier).

So, bibliometrics traditionally possessed the "broadest" notion of the object – any kind of a document – and therefore, if we agreed, that all the methods of bibliometrics are the only specific methods of sciento- and informetrics, so we should agree, that in fact we have only one field and bibliometrics is its name!

Methods

The methods of bibliometrics were reviewed in the paper by *Voverenye*,⁷ who based mainly on the work by *Prichard* and *Witting*.⁸ If we consider the list of methods from the paper by *Voverenye* and some other lists, we come to the following conclusions:⁹

1. All bibliometrics methods can be driven to the following groups:
 - 1.1. *count of documents* (including count of documents per se, bibliographic units of databases, abstractive journals etc.);
 - 1.2. *evaluation of usage of documents*: citation analysis, assessment of requests, reading activity etc.;
 - 1.3. *evaluation of scientists attitude to the documents*: quantitative studies of questionnaires;
 - 1.4. *evaluation of the content of documents*: content-analysis, the so-called "slang analysis" and possible related approaches.

2. This list of methods would generally cover the notion of all the methods used in scientometrics and informetrics.

Though it seems possible to pick up some minor scientometric approaches which are not in the list, but they are specific for socio- and econo- metrics but not for scientometrics itself.

3. It is important to note that both in Refs 7 and 8 one can find amongst the list of methods such a strange one as monstrously called as *other problems, connected with scientific documents distribution*.

To my mind it can mean only one thing: the list of methods remains open and therefore if some new method of documents quantitative studies appears labeled as informetric or whatever you like, it should be included automatically in the methodological arsenal of bibliometrics, too.

Where the difference really lies, is the sphere of *aims* of the studies and the manner of the *interpretation* of the results. It was shown in most convincing manner by *Voverenye* that, from the viewpoint of science of science, such a difference cannot be accepted as an essential characteristic to be used for exact undoubted bordering one field from another).⁷

So, we can conclude, that all the metricians should get together under the banner of bibliometrics. But some people will disagree and say that a meta-discipline already exists and its name is informetrics. According to *Egghe*,⁵ informetrics is not a separate subfield, but it includes both bibliometrics and scientometrics; the general object of informetrics (in this meaning of the term) is information with relation of potential user. If this viewpoint was approved by the 4th International Conference on Bibliometrics, Informetrics and Scientometrics, I would tell that we made half-the-way of overcoming the crisis, by starting the consolidation of metricians and there is a little reason to discuss terminology furthermore. But it was decided to call the domain as International Society of Informetrics and Scientometrics at the Conference, and this decision might only seem to be stimulating the process of bridging the gaps. First, the borderline is still believed to exist between two (?) subfields despite the *Egghe's* proposal of including scientometrics in the general "metrics" notion. Second, the oldest and the most concrete term "bibliometrics" that is semantically most close to the notion of a document – a central figure of all the subfields – was missed. One more important thing to be missed in the conception under discussion is the relation between a document and its creator. Probably, bibliometrics as a meta-discipline should start with this problem.

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