

Analysis to the Current Development of Altmetrics Based upon the Literature Metrology

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Abstract

To know more about the current situation of Altmetrics in China and to provide experience for establishing study and service of it, CNKI-collected books that specialize in the Altmetrics study are the target of analysis, and with bibliometrics, statistical figures can be drawn from the distribution of year of target literatures, periodicals that publishing the target literatures, keywords frequency, co-author and the amount of articles received fund.

Keywords: Altmetrics; replacement metrology; supplement metrology; selective metrology; works for research; statistical analysis; bibilometrics

With blog, twitter, social networking institutional repositories and other online communication becoming the mainstream of academic exchange and spread, more and more attention over the voices and comments from researchers, research institution, university and other organization were pay, which call for the birth of Altmetrics and the old literature metrology can no longer suit the demand of a scientific evaluation from the points of comprehensiveness, objectiveness and timeliness. Altmetrics, translated by some of the Chinese Scholars with the name of replacement metrology, supplement metrology and selective metrology discards the convention that treat treatises and periodicals as the only platform for scientific views exchange and instead expand the span of literature quotation to open fetch and restore platform and academic social networks, and by proposing such points of references as popularity, spots, collaborate annotation, tag density the research of Altmetrics can be based on the figures from various academic papers on the Web2.0 scientific exchange. As a means to evaluate the powers of scientific research from the point of social network, how to use Altmetrics effectively has currently been the hot spots for library and intelligence circle and there has already existed a certain number of outcomes because of the widespread theory research and practice by the scholars from both home and abroad. This paper, through the qualitative and quantitative study into the documents about Altmetrics, reveals the current situation of the research of Altmetrics and provides insights for further research and services.

1. Origins of Data and Method of Analysis

The author use the database CNKI as tool for finding data, then click the bottom for cross-databases search, insert such line of words “Altmetrics+replacement metrology+supplement metrology+selective metrology” on the blank for advanced search, reduce outcomes that are overlapped and irrelevant, and eventually we got 99 useful results (closed by June, 18, 2016), rearrange the results of data with the help of Excel and make analysis on the statistic with bibliometrics.

2. Results Adding up and Analyses

One of the important indicates for the development of a research field is the amount of issued papers in different years. From the statistics of year distribution of articles about Altmetrics, we can have more understanding on the development of the field.

Table 1: Distribution of amount of Altmetrics Papers in the year of 2012-2016

	2012	2013	2014	2015	2016	Total
Amount of Papers	1	13	16	44	25	99
Percentage (%)	1.0	13.1	16.2	44.4	25.3	100

The study told us that the first paper that introduces Altmetrics in China is *A Scientific Metrology under the Circumstance of Web2.0: Selective Metrology* authored by Chun li. Liu, in the *Library and Information Works*, volume 14, 2012. Viewing from the year distribution of the chart, we find the number is on the rise and particularly the publishing in 2015 surpasses the total number in the past three years, only the first half of 2016 witnessed the number increasing to 25, which suggests the raising attention on Altmetrics of our domestic scholars. On the other hand, with the year of number of publishing no more than 50, a comparatively small figure, it suggests that the study of Altmetrics is still in the initial stage which needs more human resources to make it more useful in the evaluation and service for science.

2.2 Distribution of Periodicals that Issue the Papers about Altmetrics

In the total 99 research papers on Altmetrics, there are 95 periodical articles, 4 academic dissertations. The predominant type of documents about Altmetrics is periodicals. The following Table 2 shows the distribution of periodicals that issue the Altmetrics articles.

Table 2: Distribution of Altmetrics Articles in Periodicals

No.	Periodical	Articles contained
1	<i>Library and Information Service</i>	19
2	<i>Information Studies: Theory & Application</i>	12
3	<i>New Technology of Library and Information Service</i>	9
4	<i>Journal of Library Science in China</i>	6
5	<i>Library Journal</i>	5
6	<i>Journal of Intelligence</i>	4
7	<i>Information and Documentation Services,</i>	3
8	<i>Library & Information</i>	3
9	<i>New Century Library</i>	3
10	<i>Information Research</i>	2
11	<i>Library Work and Study</i>	2
12	<i>Journal of the National Library of China</i>	2
13	<i>Journal of Library and Information Science</i>	2
14	<i>Documentation, Information & Knowledge</i>	2
15	<i>Journal of Modern Information</i>	2
16	<i>China Education Network</i>	2
17	<i>Chinese Journal of Scientific and Technical Periodicals</i>	2
18	<i>Chinese Journal of Tissue Engineering Research</i>	2
19	<i>Journal of Data and Information Science</i>	1
20	<i>Science Bulletin</i>	1
21	<i>Acta Editologica</i>	1
22	<i>Editorial Friend</i>	1
23	<i>Publishing Research</i>	1
24	<i>Computer Engineering</i>	1
25	<i>Science-Technology & Publication</i>	1
26	<i>Studies in Science of Science</i>	1
27	<i>Science of Science and Management of S. & T.</i>	1
28	<i>Shanxi Science and Technology</i>	1
29	<i>Library Theory and Practice</i>	1
30	<i>Research on Library Science</i>	1
31	<i>Chinese Journal of Medical Library and Information Science</i>	1

We can find out from Chart 2 the total ninety-nine Altmetrics papers were published by thirty-three individual periodicals in which twenty-two are about library and information, four are about edit and publish, four are about fundamental science, and there still one on education, fundamental medicine, electronic information science respectively. It suggests that the major research group of Altmetrics is in the library and information circle, and it also attracts the attentions from other fields like edit and publishes. Besides, in the thirty-three different periodicals, there are nineteen from CSSCI library, information and philology periodicals, 2 from CSCD. It also shows the value our academics put on the study of Altmetrics.

2.3 Keywords Analysis

The keywords that enjoy high-occurrence in the field of a discipline reflect the hot issue of the field, and the change of keywords signals the trend of its future development. We find out from the statistic that there are total 532 keywords in all Altmetrics papers, and after sorting out words that have similar meanings by using Excel, we got the keywords that have more than three occurrence listed in Table 3.

Table 3: Keywords that Has Showed UP More Than Three Times in Altmetrics Articles

Keywords	Frequency	Keywords	Frequency
Altmetrics	37	library	5
Replacement metrology	26	Selective metrology	5
literature metrology	16	informetrics	5
Supplement metrology	13	Altmetric.com	4
academic influence	13	ImpactStory	4
Institutional Repository	11	open science	4
indicator	10	Scientific research personnel	4
open access	10	webmetrics	4
scientific communication	9	information retrieval	3
scientific evaluation	9	citation analysis	4
article-level metrics	8	impact factors	4
evaluation method	8	integrated evaluation	4
social network	7	Plum Analytics	3
research paper	8	PlumX	3
academic evaluation	8	academic publishing	3
scientometrics	7	diffusing mechanism	3
Evaluation indicators	7	metricstool	3
social media	7	visualization	3
social network	5	journal evaluation	3
social influence	6	article evaluation	3
correlation analysis	6	library's services	3
research production	6	information service	3
influence	6	academic exchange	3
principal component analysis	5	academic journal	3

We can find clues from Table 3 on the contents and features of domestic Altmetrics research.

2.3.1 The Chinese translation of Altmetrics: including replacement metrology, supplement metrology, and selective metrology shows high occurrence, which also prove the views that were proposed by the academics like Luo mu hua on the three major ways to constitute the Chinese name of Altmetrics: Replacement metrology raised by Qiu jun ping and Yu hou qiang, Supplement metrology raised by Qing bing and Tang shan hong and Selective metrology by Liu chun li.

2.3.2 Altmetrics tool for research analysis: Altmetrics depends heavily on tool because tool can be able to provide help for the filtration, selection and analysis of academic resources. Keywords that have showed up more than three times are the main tool of Altmetrics like metering outfit, Altmetric.com, ImpactStory, Plum Analytics, PlumX. Therefore, the Altmetrics tools are the core points that attract the academic attention.

2.3.3 Indicators system analysis: evaluation indicator, measuring index, factor of influence, comprehensive evaluation show up rather frequently, which indicates that a comprehensive evaluation to the academic yield and indicators system analysis will be the hot spot in recent years.

2.3.4 Altmetrics application research:

1. Influence evaluation: The keywords that have showed up more than three times are academic influence, social influence, scientific evaluation, evaluation methods, academic evaluation, social networking, social media, periodical evaluations, paper evaluation, research officer. It suggest that Altmetrics with features of timeliness, openness, extensiveness, and diversity with indicators is the orientation that lead to the diversification of influence evaluation and it is the primary function of Altmetrics application.

2. Library service: The expressions that have more than three occurrences include library, open science, library services, information services, academic exchanges, information retrieval. It suggests that Altmetrics help to build the storage of library, offer high quality of information service for the readers of library, increase the effectiveness of information search, improve the system to evaluate literature, promote academic exchange with new force and opportunity, attracting the attention from scholars.

3. Institutional repository construction and service: high occurrence of institutional repository, open fetch and store indicates that since the courses for the development of database and Altmetrics is basically at the same period, Altmetrics can perfectly fit into and be applied in the construction and operation of institutional repository. Introducing supplement metrology indicators to rebuild the database evaluation indicators system will be able to provide the managers with qualitative and dynamic data support when they make decisions and also make it a easy way for every visitor to locate the resources they need.

3.2 Co-authored

Co-authored rate refer to the ratio among the average number of authors of journal articles, the number of co-authored published articles and the total number of articles in the periodicals for a period of time. Collaboration and cooperation rate reflects the degree of intelligence that the author of a journal or discipline

can play up to. The higher the rate, the more intelligent they can execute. From the results of Table 4, we can see that in total ninety-nine articles, except six articles that are unmarked with author, there are 185 people that are co-authored in the other ninety-three articles, papers that are co-authored have sixty with the degree of co-authored amounting to 1.99, the rate of co-authored to 64.5%, a rather high figure. This is because the research and service of Altmetrics requires joint effects made by the data officers of library, computer professionals, and scientific researchers. Cooperation in science is an important way to realize the sharing of advantageous resources, increase the exchange and communication of knowledge, and boost the productivity of scientific workers effectively, promote the quality and power of scientific outcomes.

Table 4: Altmetrics Articles that Are Cooperated

Number of Authors	Amount of Papers	Percentage(%)
Single	33	35.5
Two	35	37.6
Three	21	22.6
Four	2	2.2
Five	1	1.1
Six	1	1.1
Total	93	100

2.5 Fund-received projects

In ninety-nine Altmetrics research papers, there are forty-four that are fund-received from total sixty-two sources (not just one source for each case), including twenty-eight sources from the national awards, which are seven national science foundation of china, eleven state social science foundation, nine central government college special allotment for scientific research, one foundation for post-doctoral research in China, twelve sources from province level, five from local level, six from institutional level, nine from college, two from association. The distribution of year of papers received funds are illustrated in Table 5

Table5: Distribution of Funded Altmetrics Articles in the year of 2013-2016

Year	2013	2014	2015	2016	Total
Amount of Literature	6	9	19	10	44

From the table of year distribution of fund-received projects, the amount of fund raised Altmetrics projects is on the rise. The funded projects take 44.4% of the total number of published works indicates attentions from the authorities interested attracted by Altmetrics and also shows that the Altmetrics specialist value project application and take active action in winning the supports from the supervisors, making more favorable environment for the research and service of Altmetrics, boosting a high level of study and service quality.

4. Conclusion

From the statistical analyses of articles on Altmetrics we can conclude that both the number of papers that engage in Altmetrics and the funded projects of research papers are up, which indicates more attentions from academics and authorities interested. Second, besides on the theory study, the academics also pay attention to the application of Altmetrics to influence evaluation, library service, database construction and service. For instance, the academic Ma yu meng wrote an essay *Realization of Application of IAuthor for the Evaluation of Institutional Scientific Research*, published at *Chinese Library Journal*, volume 2, 2016, and his research is constructed on the dimensions of literature metrology, network metrology, replacement metrology and funded projects, creating a new path for the domestic scientific institutions and colleges to carry out appraisal to scientific outcomes. Altmetrics has two advantages, first is that it breaks the frame that we depend on the platform of journals to evaluate the force of literatures, and pay more attention to the effects on the public brought by the literatures. Even some of the academics point out that Altmetrics indicators becoming widespread in use is irreversible because of the globalization of scientific paper evaluation, and in the future it may also become one of the important criteria for examining the overall quality of the scientific journals. Get to know and In command of the rules of how to use it for evaluation will help increase the status of our academic articles, accelerate the pace for the domestic journals to go global.

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