

Digital libraries and Altmetrics: how are (digital) libraries engaging with metrics?

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Abstract

The paper aims to give a landscape overview of how digital libraries in Italy are engaging with and using metrics (including altmetrics). The methodology is qualitative and includes interviews to a sample of academic librarians about their perceptions and opinions on metrics and the use they do of metrics for digital library procedures and services.

Keywords: Altmetrics, Bibliometrics, Digital Libraries

1. Introduction

The traditional "ecosystem" of the in print scientific communication is changing to adjust to the change introduced by the digital technology combined with the "open" paradigm of scientific research. The elements that highlight the innovative aspects of scientific communication are: the opening of the research cycle, the stimulus to sharing and collaborating, re-using the research results. This new scenario of scientific communication is called Open Science (or e-science), supported by the European Commission because it allows quick access to search results and extends the impact of research to all citizens.

A first consequence of the transformation of scholarly communication is that research results are no longer limited to periodicals or books, but include other types of publications, created at different stages of the research cycle, such as research data (dataset), video, blogs, infographics, etc. The research findings that are born digital, are online and Open Access (integrated with algorithms necessary for access and re-use) adopt an open cycle, challenging the organization structured in traditional rigid disciplinary sectors. We can speak of a Mode 2 of knowledge, as opposed to the traditional method of understanding the science, Mode 1, because it is characterized by interdisciplinarity and the links with the production and technology industry. The way research has become more 'free' and unencumbered by institutional structures and places, has an impact on the community of reference: as a consequence of the enlargement of the frontiers of research impact, in the environment Mode 2, the division of science into disciplines is losing value and the community of peers becomes

hardly recognizable and distinguishable from the external broader environment reached through social channels [18].

Scholars are now using a variety of platforms, enabling many innovative features. Bosman and Kramer [1] from Utrecht University have carried out a survey of more than 20,000 scholars, highlighting the use of about 400 different platforms and collaborative software. In the same survey, Italian scholars respondent (about 550) have confirmed the international trends: they are creating new types of publication and want to share data and codes, using platforms which in most cases are not offered by their institutions [13].

1.1 Traditional metrics and Altmetrics

The bibliometric analysis is essentially at four levels of analysis [8,9]:

Level 1: Metrics focused on individual articles;

Level 2: Metrics focused on journals that collect individual items;

Level 3: Metrics focused on the authors in the course of their careers;

Level 4: Metrics focused on the production of institutions over time.

Traditional bibliometric metrics, such as the Impact Factor, have mainly concentrated on the first two.

The new scholarly communication context is therefore characterized by abundance of information and multidisciplinary. This promotes the use of new metrics, which include along with impact, more linked to closed systems, other equally necessary indicators and more connected in open systems such as transparency, visibility, etc ..

1.1.1 Bibliometrics

The assessment of research results should therefore have other instruments, besides the traditional ones such as the Impact Factor, H-Index and counting citations, especially for the new types of publications, which are Open Access and are the product of different phases of the research cycle. The application of the type of bibliometric tools has limitations, even for products of traditional research; the quantitative measurement can strengthen peer review, when coupled to it. As pointed out in the Manifesto of Leiden, the numerical indicators should never replace a well-founded assessment and their use for evaluation purposes must take place in a conscious and prudent [2, 14, 15].

1.1.2 Altmetrics

Altmetrics, the methodology that was established recently for the evaluation of research results [7], uses a variety of bibliometric techniques to measure the impact, defined as access, sharing and re-use. These techniques include both "intrinsic" measures linked to the author's scientific community, and "extrinsic" measures from the broader context and outside the research community.

Altmetrics includes for example: web metrics, article-level metrics, social media academics (Academia.edu, ResearchGate, MyScienceWork), bibliographic platforms such as Mendeley, platforms of preferences, academic social media such as LinkedIn, Reddit, Faculty of 1000 [16].

Altmetrics is often combined with "Open Science" as it is the tool for evaluating publications in institutional repositories. Even the post peer review is associated with Altmetrics, where the peer review takes place after publication [6].

Altmetrics can also be combined with usage statistics and citation analysis. All these techniques are not actually intended as alternatives to traditional Impact Factor, but complementary [10, 11, 16, 17] and in addition to traditional bibliometric metrics, they are helpful in filtering search results in the context of Open Science.

2. Digital libraries drifting into confusion

Digital libraries have always been at the intersection of the research cycle, the cycle of scientific publications and access to information, and the first prototypes of digital libraries were created in the context of advanced research community. From a passive role, as intermediary who "reactively" answers to specific questions, digital research libraries are now seeking an "active" role, which is integrated in the research cycle of the scientific community. Some digital libraries have been starting new University Press, or have begun to include among the services the management of research data and publish the linked open data to enhance the catalog data.

This research starts from the question: why digital libraries are not considered as "altmetrics" platforms for evaluating scientific publications?

Some metrics related to libraries have been used for some time (see for example the project GIM): they count how many copies of a book are held in a collective or local catalog (eg. SBN, WorldCat, etc.), or measure the numbers of subscriptions and loans of journals and articles. The role of digital libraries, in the context of Open Science, could do more: like "boundary objects", virtual spaces that facilitate sharing, collaboration and re-use, digital libraries could become the first source of data for research results, then offering to aggregate all the alternatives and complementary metrics to traditional metrics.

Academic libraries, in particular digital libraries, could be the first to offer themselves as platforms for the entire research lifecycle, providing instruments for each of the research cycle, from creation, to access and preservation and to the re-use of new types of research results.

Altmetrics seems to offer many opportunities to libraries. An initial survey carried out on behalf of the Association of College and Research Libraries by Roemer, R. C., & Borchardt, R. [8,9] has investigated librarians through a questionnaire: the role in the library, the metrics

used, the services offered. Almost exclusively reference librarians (subject librarian, liaison librarian) have replied to the questionnaire. The survey results have shown that not all librarians use Altmetrics, but only 76% of librarians who do support services for the evaluation of research are using both Impact Factor and Altmetrics. Crucial service is the training activities, both in favor of teachers and the librarians themselves. Galligan [4,5] employee of Swetz, before the bankruptcy of the company, has published in her blog examples of guides for users that can be used in the library.

Konkiel & Bruner [3] list the services that libraries provide or could provide taking advantage of Altmetrics and the Impact Factor. These services are all aimed at facilitating the evaluation of research and include bibliographical guides or a brief tutorial; libraries may also use metrics for the management, such as for collection acquisition decisions and to manage institutional repositories.

2.1 An exploratory study in Italy: methodology

The library systems of the Tuscan universities are hybrids, although digital resources are the majority of resources. For the purposes of this survey, the authors have only considered the digital collection.

First, in this study we have focused on Altmetrics in digital libraries: what role is offered supporting the research evaluation? What do they do to improve the impact of the research results of individual teachers?

Second, we have investigated Altmetrics for libraries: in times of budget cuts, digital libraries have to make decisions, what metrics can help them to improve services?

The digital library is therefore nothing more than collection of “data”? But what metrics adopt digital libraries in Italy?

The survey has the following objectives:

- understand the current use of metrics in the Italian university (digital) libraries for research support;
- understand the current use of metrics in the Italian university (digital) libraries to support management.

To do this, the authors have made a first exploratory study focused on the (digital) libraries of Tuscan universities, trying to understand the perceptions and opinions of a significant sample of university librarians. The choice of the University of Florence, Pisa and Siena library system has been based on the author’s ability to easily collect data on the metrics shown by the library systems. The library systems of the Tuscan universities have a tradition of co-operation: in recent years they have launched SBART a collective library system of the Tuscan universities, with the aim of sharing the management of library services and the full movement of users in all libraries. They have started the first institutional repositories about

ten years ago, in some cases linked to the University Press of the respective Universities. The Siena and Florence library systems are also involved in the Project GIM (Group Monitoring Systems University's librarians) the data management system that collects statistical data on the management of libraries, including the use of digital resources. The University of Florence also collect data created and used by the library system with the SimonLib software.

A first questionnaire on the use of metrics has been forwarded to the coordinators and directors of the library systems of the Tuscan universities, asking them to disseminate it to the responsible librarians (librarians and/or reference librarians in charge of acquisitions). The coordinators of the library systems were subsequently contacted for an interview focused on investigating strategies and trends of services development for research support services.

The metrics that have been investigated are:

- Impact Factor: the metric most known, referring to the journals (and not article);
- Citations: includes tools such as Web of Science, Scopus, Google Scholar, Book citation Index, Publish or Perish;
- User statistics: refers to visit Web pages and unloading and are typically extracted from the Project Counter or other databases;
- Altmetrics: statistics of all types of scientific result: article, book, research data, and all other new types of publication.

3. First findings: how, what, by whom?

The respondents have been eight: managers (50%), reference librarians (37.50%), cataloging and acquisitions librarians (12.50%). They represent all the librarians directly involved in the service supporting faculty research.

All librarians suffer from a disorientation in this phase of transformation of scholarly communication. The service trend is towards integration within the research cycle and new partnership within the administrative offices and university managerial direction. All respondents reported to have reacted to the new requirements, but they would like a clear strategy within the institution, as well as they highlight the obstacles they encounter. Integrating the replies to the questionnaires with the interviews to the coordinators of the library systems, it was possible to understand that there was not only a "reactive" response but also an initiative "proactive" behaviour, towards greater integration of libraries in research. This "proactive" response has been driven by the coordinators of the library systems. They found that the evaluation carried out by the Government ANVUR agency and subsequently the tenure process (tornata) were opportunities to get out of the narrow walls of libraries and initiate new partnerships with researchers and faculty.

They have not underestimated the problems of this different "proactive" approach. The most important issue is the need for training and updating the competencies on the metrics, to obtain appropriate skills and capabilities (Fig. 1). It is also highlighted the request for additional staff and additional financial resources for the extension of services. For example,

the University of Florence has organized a Working group for a personalized support to teachers, with representatives from each thematic area, collaborating with a computer scientist,

Q6 Di quali risorse, staff e/o formazione la tua biblioteca avrebbe bisogno per dare servizi basati sulle metriche?

Hanno risposto: 8 Hanno saltato la domanda: 0

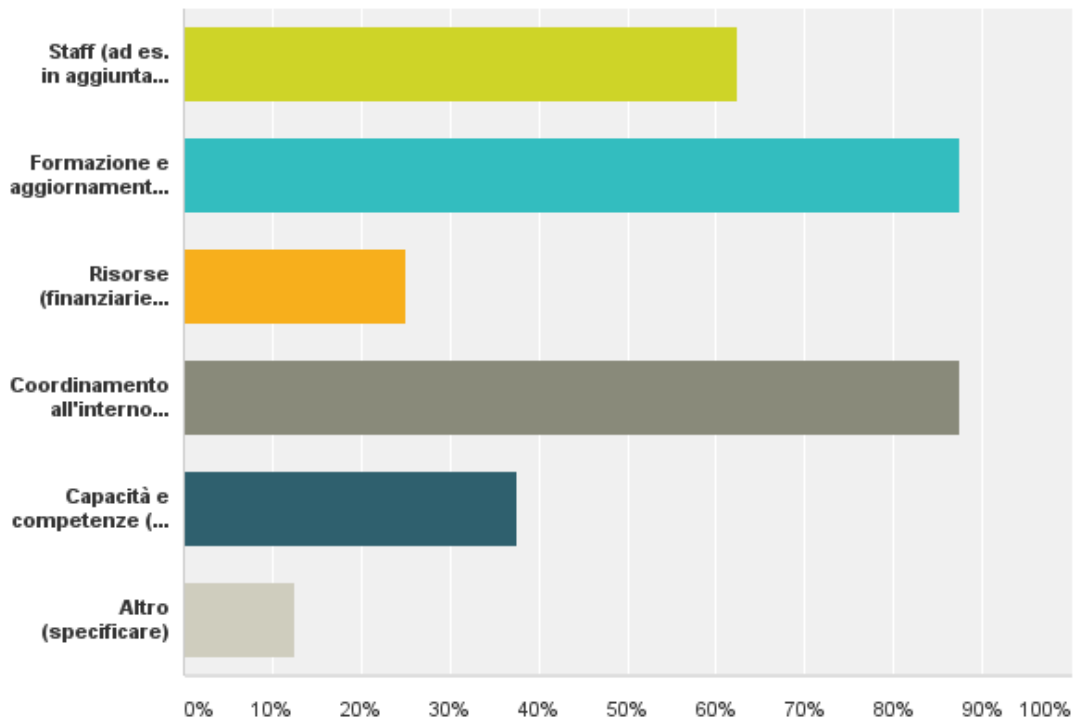


Fig. 1 Services supporting research evaluation: obstacles

In the open questions needs and perceived barriers are indicated by respondents, such as:

"A central coordination that spreads data to a targeted teachers."

"In libraries we were in a few"

"Capacity and skills are needed."

But what are the skills and current knowledge of the respondents? They are low or mediocre for Altmetrics (0)! Better knowledge is evidenced for the Impact Factor (62,5%), in second place are the usage statistics and H index and finally the count of the citations (37,5%). In interviews with coordinators they explained the greater competence on bibliometric systems as a result of ANVUR metrics that are centered on traditional bibliometric systems.

3.1 Metrics in digital libraries

What role the library has offered for the evaluation of research (Fig. 2)? The librarians who responded in the first place say that they give individual advice: this is a personalized and reactive service to individual user requests, mainly concentrated on Impact factor (100%), H-Index and counting of citations (80%). The service is based mainly in helping scholars to enter the data for the process of evaluation managed by ANVUR and correcting input errors, with a technical support role. The citations count of search results is a support service provided by 100% of respondents, along with Impact Factor metrics and usage statistics (50%).

A more traditional service is that of intermediary, concentrated in facilitating the search of resources that affect the count of citations (100%), Impact Factor, H-Index and Altmetrics (67%), little of usage statistics (33%).

What do the librarians do for disseminating research results produced by researchers of the respective institutions?

To disseminate the research results, the metrics used are: counting citations, the Impact Factor and Altmetrics (all at 50%). This is a result we consider good, which shows the tendency towards the use of various metrics. However, there is no training on metrics. Only 20% of respondents list training tutorials and seminars, however limited to the Impact Factor metrics, H-Index, counting citations, usage statistics (67%) and not Altmetrics.

Institutional repositories are a basic service launched ten years ago by the Tuscan universities for a greater integration in the research cycle, and the value of search results deposited are measured by citation counts and usage statistics.

Q2 Quale ruolo la biblioteca ha assunto per la valutazione della ricerca?

Hanno risposto: 7 Hanno saltato la domanda: 1

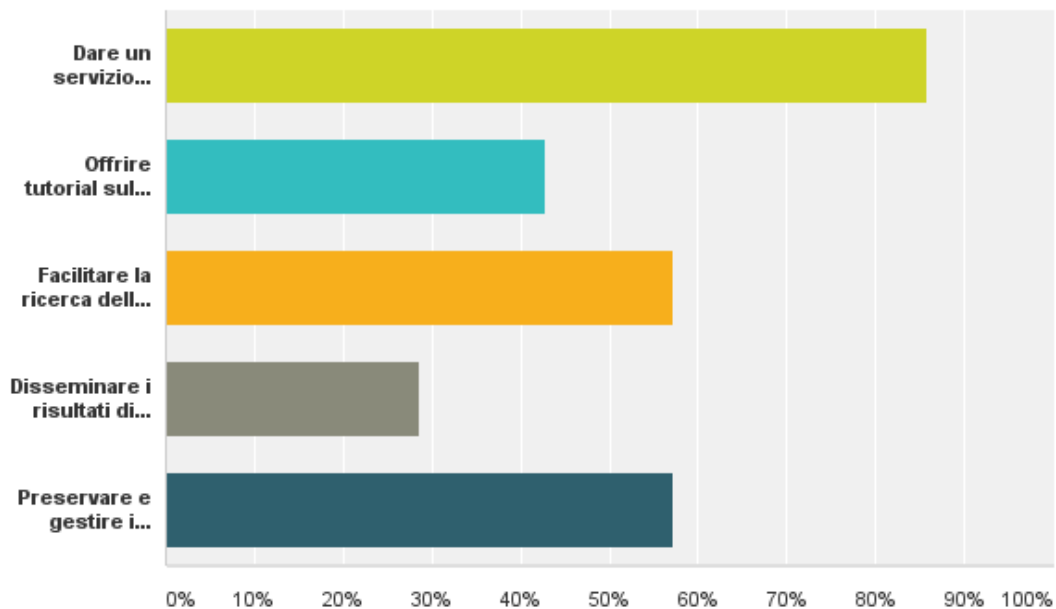


Fig. 2 Services supporting research evaluation

3.2 Metrics for digital libraries

How do digital libraries use metrics for internal management?

The libraries of the Tuscan universities have collected and created a considerable amount of data, monitoring their activities and evaluating the use of resources. The data available to librarians are mainly usage statistics, such as those collected by GIM (until 2010), and that provided by journals aggregators through Counter. The development of the collection is then based on usage statistics (100%) and less on counting of citations (29%) but Impact Factor, H-Index and Altmetrics are not used at all.

Some respondents have highlighted the importance of disciplinary differences, such as the humanities that is not bibliometric.

It 'also interesting the comment by one of the respondents who stated that librarians use the metrics to "defend" and justify the purchase of databases. For journals acquisition and monographs criteria not bibliometric are also used, as the scientific value of the publishers.

4. Conclusions and next steps

The survey has been a first exploratory study in Italy on the use of metrics from the digital libraries, and the findings have highlighted some "proactive" initiatives by the Tuscan universities library systems that tend to have a more active role in the research cycle. The coordinators are pursuing greater integration strategies in the research cycle, starting to plan now a support for the management of research data.

Why digital libraries are not considered "Altmetrics" platforms for evaluating scientific publications? The results showed that librarians consider the impact of research results separated from the impact of the digital library. The library systems have a large amount of data, which, however, are not used for the evaluation of research. The two metrics, those for digital library management and those for the evaluation of research are perceived as parallel and without any connections. The reason is mainly motivated by the choice of ANVUR for traditional bibliometric metrics and "proprietary" commercial services data leading the assessment of research.

The current use of metrics in the Tuscan university libraries supporting research focuses on traditional metrics, which are dependent on services and subscription to "owners" of private companies: Impact Factor, H-Index and citations system.

The current use of metrics in the Tuscan university libraries supporting digital library management is essentially based on usage statistics. To collect this usage statistics of library resources and services, they are using proprietary software and closed data are produced.

In conclusion, Altmetrics is little known and even less used. The survey has evidenced that the librarians need more competencies on Altmetrics.

The hypothesis to be still investigated is whether digital libraries, which are creators and consumers of data, can be used as metrics platforms for the evaluation of research.

It would also be important to understand how Altmetrics could be used to measure the impact that digital libraries have on the community of users. This could be a first step to match the impact of digital libraries with the research results data: now these two metrics are kept separately. A change of approach towards Altmetrics is expected in the future, further studies could investigate the possible combination of different metrics.

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