

# **Towards a Bibliometric Database for the Social Sciences and Humanities – A European Scoping Project**

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# **'Towards a Bibliometric Database for the Social Sciences and Humanities'**

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## Executive Summary

The aim of the project was to explore the possibility of developing a database for capturing the full range of research outputs from the Social Sciences and Humanities (SSH). SSH research outputs include not just those articles published in international journals, but also articles in national journals, academic book chapters and books, books aimed at a more popular audience, monographs, reports in the 'grey literature', and non-published outputs from fields such as the performing arts.

Such a database is intended to serve a number of related purposes. One is to address the growing pressure from policy-makers and research funders to demonstrate 'accountability' and to ensure 'value for money'. A second is to develop performance measures for assessing research quality and impact. For basic research in the natural sciences, there are fairly well established indicators of research output and impact (based on publications and citations), but these work poorly for the social sciences and barely at all for arts and humanities.

Third, research funders and others may want to use the database to provide an overview of SSH research outputs in Europe. Fourth, funders and policy makers may use it or as a source of information of to identify areas of strong research capacity and those that are perhaps in need of capacity-building or support. Lastly, research councils<sup>1</sup> may seek to use the database as a tool for mapping emerging areas of (often interdisciplinary) research.

The question addressed in this project is, 'What is the potential for developing some form of research output database that could be used for assessing research performance in SSH?'

An important aspect to the background context of the study relates to recent developments with respect to various databases and bibliographic lists on which a SSH bibliometric database might build. These include the growth of 'Open Access' publications, significantly improved coverage of journal literature by the Web of Science and

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<sup>1</sup> In what follows, we use the generic term 'research council' to include all research-funding agencies.

Scopus, the emergence of Google Scholar as a new source of publication and citation data for books as well as journals, the growing availability of digital data on publications from book publishers, the development of various national or disciplinary bibliographic databases, and the establishment of a range of institutional repositories for research outputs.

The report identifies the main problems and issues to be confronted in any attempt to construct an inclusive SSH bibliometric database. It analyses a number of key considerations for the creation of an inclusive SSH bibliometric database, along with certain operational issues. On this basis, it sets out various strategic options.

The report concludes with a number of recommendations chosen on the basis of their practicality and cost-effectiveness. We propose a way forward based on four main recommendations. The first centres on the definition of criteria as to which SSH research outputs should be included in a bibliometric database and the establishment of a standardised database structure for national bibliometric databases. The second explores the option of involving a commercial supplier in the construction of a single international SSH bibliometric database. In both of these, the focus is on published scholarly outputs appearing either in peer-reviewed journals, or in books that have likewise been subject to peer-review before publication. The third recommendation involves conducting a small pilot study focusing on one or more specific SSH disciplines. The fourth recommendation deals with the longer-term expansion and enhancement of the SSH bibliometric database to include other SSH outputs (that is, in addition to peer-reviewed articles and books). A hybrid approach (i.e. a combination of 'top-down' and 'bottom-up') has been recommended for the implementation of each recommendation because this appears to offer the best of both worlds – impetus, guidance and authority from the top, and expertise and experience from the bottom.

The report argues that these four recommendations offer the most promising way forward in exploring and then establishing an international bibliometric database for the social sciences and humanities. As the approach outlined involves various stages, it provides the opportunity to curtail the process at any point if the

problems prove to be intractable or excessively expensive to overcome. It also suggests that the prospects of success will be greater if, for pragmatic reasons, the initiative starts with a relatively small group of research councils and countries, allowing others to join in subsequently as momentum builds and as the necessary resources become available.

# **Towards a Bibliometric Database for the Social Sciences and Humanities – A European Scoping Project**

## **Introduction**

The primary aim of this Scoping Project was to investigate the possibility of developing a comprehensive database for capturing and assessing the full range of research outputs from the Social Sciences and Humanities (SSH), preferably including non-published research outputs from fields such as the performing arts.

Such a SSH bibliometric database is intended to serve five main purposes. The first is to permit the construction of indicators needed to demonstrate accountability with regard to the public funds devoted to research. The second is to develop indicators for assessing research excellence. Third, policy makers, research funders and others may wish to use the bibliometric database to provide an overview of SSH research outputs in Europe. Fourth, funders may use it as a means for assessing research capability and for identifying areas in SSH that may require capacity-building. A research output database might permit a 'portfolio' analysis of SSH research, contributing to decisions on resource allocation, particularly in the Humanities where there is often little relevant information. Fifth, research councils may use the information provided by the bibliometric database to map emerging areas of (often interdisciplinary) research with an aim of ensuring that they are adequately resourced.

In recent years, the European Commission has underscored the importance of developing public information systems on higher education institutions, including data on research performance, as a vital part of the emerging research infrastructure of the 'European Research Area'. The availability of a bibliometric database for SSH would thus represent an essential component of this infrastructure.

This report analyses the main obstacles that would have to be overcome in developing such a bibliometric database. It also examines developments with regard to a range of bibliographic and well as bibliometric databases, suggesting how a SSH bibliometric database might build upon these developments. It concludes with a

number of recommendations for how such a project might be taken forward to the next stage. These are based on ideas developed by the Project Board Members, on discussions at two international workshops of invited experts, and on two commissioned studies, one from Prof. Diana Hicks and Jian Wang (Georgia Institute of Technology, U.S.) (see Annex 1) and the other by Henk Moed (CWTS Netherlands) and Felix de Moya (SCImago Research Group-CSIC, Spain) (see Annex 2).

In order to avoid confusion, it should be stressed right at the outset that throughout this report we have adopted a relatively broad definition of 'bibliometrics', one that goes well beyond 'just citations'. The aim here is to establish whether it is feasible to construct a database covering the full range of SSH research outputs to help fulfil the five purposes outlined above. For this we use the term 'bibliometric database'.

Ideally, what is required is a database that brings together, in a consistent and comparable form, data on the main research outputs of SSH (i.e. the number, kind and quality of the outputs) and also provides an indication of the impact of those research outputs not only on fellow academic researchers but also more widely (whether in the form of economic and social impact, or impact in terms of enlightening the general public).

To achieve this, one would need a reasonably inclusive bibliometric database that encompasses different forms of research or scholarly output from SSH – i.e. one that includes published articles in international and national journals, book chapters, monographs and books, and other non-published and non-textual research outputs. Some of these data may be obtained from high-quality bibliographic databases, so these are likely to be an essential building block for the construction of an inclusive SSH bibliometric database. However, many bibliographic databases currently lack the data needed to enable that database to be used for bibliometric purposes, such as the institutional addresses of all the authors in a consistent and comparable form.

Thus, an inclusive database suitable for use in the bibliometric analysis of SSH will differ substantially from existing bibliometric databases like the Web of Science and Scopus, which consist

primarily of scholarly journal articles published in international journals, and mainly written in English. These two databases involve strict data-collection and verification protocols, enabling them to be used for the construction of various bibliometric indicators. For example, citation data are often used to assess the scholarly impact of published research outputs, as required in the research performance assessment exercises that are increasingly being introduced by national governments worldwide. However, neither database is currently suitable for assessing SSH research.

In the recommendations suggested in this report, we have attempted to address the main problems that the construction of a more inclusive SSH bibliometric database poses. These problems include:

1. The scale and variety of research outputs from SSH. Unlike in the Sciences, in the Social Sciences and the Humanities we need to include a much wider range of outputs, such as books and book chapters, more 'popular' books and articles aimed at the general public rather than academic peers (or 'enlightenment literature'<sup>2</sup>, as we term it here), 'grey' literature such as policy reports, as well as (for some fields at least) research outputs with a non-textual content. Thus an inclusive SSH database must allow for variety in the range of indicators that may eventually be constructed from the database.
2. The need to consider national journals and research outputs (in particular, those published in languages other than English). However, this raises the issue of what criterion (or criteria) should be used in determining which research outputs

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<sup>2</sup> 'Enlightenment literature' is the term used here for publications aimed primarily at the general public rather than academic peers: "Enlightenment literature represents knowledge reaching out to application and is found in periodicals whose goal is knowledge transfer or 'enlightenment' of non-specialists" (Hicks and Wang 2009, p. 4). The authors also refer to a study by Burnhill and Tubby-Hille, which found that in the UK "projects in education [were] reaching practitioners through the *Times Education Supplement*, with researchers in sociology, social administration, and socio-legal studies publishing in such periodicals as *New Society* and *Nursing Times*" (see Burnhill and Tubby-Hille, 2003). In Norway, Kyvik found that one-half of social scientists published contributions to public debates (see Kyvik, 2003, as quoted by Hicks and Wang, p. 4).

should be included and which excluded. As one of the commissioned reports points out, there is a need for “a consistent, evidence-based criterion for journal scholarly quality”, in particular, one “that can be applied impartially and without favouritism across the range of European languages ... [This] will be crucial to building a respected bibliometric infrastructure for SSH” (Hicks and Wang, 2009, p. 12).

3. The highly variable quality of existing SSH bibliographical databases and lists, from which the new bibliometric database is likely to draw substantially. This variability reflects the uncertainty and inconsistency inherent in the quality criteria currently used to select entries for existing bibliographical databases, as well as variations in the editorial standards of the databases themselves.
4. The lack of a standardised database structure for the input data. It is vital to ensure consistency of data fields, a task made all the more difficult here by the fact that, for published outputs, the publication and referencing characteristics of those outputs vary widely across SSH disciplines. Moreover, it is important to keep in mind the non-published research outputs that need to be considered in any eventual database.

The Report is structured as follows. **Part A** provides overviews of (1) recent developments in two of the main bibliometric databases, the Web of Science and Scopus; (2) the role of bibliometric indicators in research assessment exercises; and (3) existing SSH databases and lists, including brief descriptions of their characteristics and problems or limitations with regard to extending them to use for bibliometric purposes. **Part B** sets out the main issues to be resolved in establishing a possible ‘road map’ to the creation of an inclusive bibliometric database, in particular focussing on (1) the key underlying considerations; (2) the operational issues; and (3) strategic options for development. **Part C** begins to bring everything together and presents a range of potential approaches for the construction of the SSH bibliometric database. **Part D** concludes with a number of Recommendations, which have been synthesised from the various approaches discussed in Part C.

## **PART A**

### **Recent bibliometric developments in the Social Sciences and Humanities**

There are a number of interesting developments currently being undertaken by the Web of Science and Scopus to expand their coverage of Social Sciences and Humanities (SSH) journals. The Web of Science (now published by Thomson-Reuters, but previously known by its constituent parts, the Science Citation Index, the Social Sciences Citation Index, and the Arts and Humanities Citation Index) has increased the number of SSH journals it covers from 1,700 in 2002 to 2,400 in 2009. As from 2009, the Web of Science journals includes 1,200 'regional' journals, defined as "journals that typically target a regional rather than international audience by approaching subjects from a local perspective or focusing on particular topics of regional interest" (Moed et al., 2009, p. 29).

With regard to Scopus (which is produced by Elsevier), a key development is the addition in June 2009 of 1,450 journals, which takes its collection to 3,500 SSH journals (i.e. nearly 50% more than the Web of Science). Moreover, Scopus is starting to add bibliographic meta-data on highly cited books (in particular, data on the full title of the book, the publisher, all the authors and their institutional affiliations). This is important because in some SSH fields a very substantial portion of the published research output consists of books and book chapters rather than articles in journals covered in the Web of Science. These non-'citation-indexed' books and chapters are often well cited in articles in journals scanned by the Web of Science (CWTS 2007, p.48). This illustrates the vital importance of including books and book chapters as source records in a comprehensive SSH bibliometric database.

For several decades from the 1960s onwards, the sole source of bibliometric data was the Science/Social Sciences/Arts and Humanities Citation Index (then published by the Institute for Scientific Information), which later became the Web of Science. However, this situation changed in 2004 with the appearance of Scopus, which provides publication and citation data for a

somewhat larger number of journals for 1996 onwards. It would appear that there is currently an element of competition between these two main bibliometric database providers as to which will be seen as providing the more comprehensive SSH database. Furthermore, the effort by Scopus to include books signals a move to be more inclusive with regard to the full range of published research outputs from SSH. The Web of Science's recent inclusion of regional journals reflects a similar desire. It is quite possible that competition between the two established database providers may result in further expansion and inclusion of other SSH research outputs.

The third and newest competitor to the Web of Science and Scopus is Google Scholar (along with Google Book Search<sup>3</sup>). According to Moed et al., Google Scholar, along with Web of Science and Scopus, is a bibliographical database that facilitates "desk-top or poor man's bibliometrics" (Moed et al., 2009, p.19). This database is the only one of the three that currently covers books and book chapters extensively, and it provides simple indicator data, such as numbers of citations. It is relatively easy to find books in Google Scholar because it has full-text indexing.<sup>4</sup> Together, Google Scholar and Google Book Search apparently scan millions of books. However, it remains to be seen whether Google will develop this extensive database into a fully-fledged source for bibliometric analysis. At present, Google fails to provide clear information on what is, and what is not, covered in the database. As a result, their records are not presently usable for systematic, rigorous bibliometric analysis, and there is a concern about the accuracy of their citation links.<sup>5</sup> However, with the continuing developments in software applications

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<sup>3</sup> Google Book Search scans books from a range of sources, including digital repositories, and enables users to access and read extracts from them.

<sup>4</sup> For example, when B.D. White searched for material on Gabriel Plattes, a 17th century utopian and scientific author; in Google Scholar and JSTOR (also full text), he found 50-60 articles, while in the Web of Science, which is bibliographic rather than full text, he found less than five (see B.D. White (2006), 'Examining the claims of Google Scholar as a serious information source', *New Zealand Library and Information Management Journal*, 50(1), 11-24, as quoted in Hicks and Wang (2009), p. 8).

<sup>5</sup> See Hicks and Wang (2009) and Moed et al. (2009).

and advances in computer science, there is certainly the potential to overcome these concerns.

## **The role of bibliometric indicators in research assessment exercises**

Research assessment exercises are increasingly being undertaken by national agencies and individual research institutions worldwide. There are a number of reasons for conducting these assessment exercises, including: (a) the evaluation of research excellence; (b) the adoption of a funding formula to distribute funds between universities and/or research institutions; (c) ensuring accountability with regard to the use of public monies (and assessing the return on investment of public research funds); (d) as a marketing mechanism in the competition for prospective students; and (e) as a benchmarking tool employed by higher education and research institutions.

Many of these exercises rely, in part, on the Web of Science or Scopus for the creation of citation impact indicators. While there is merit in using citation impact indicators, there are problems with a sole reliance on these databases, notably the fact that these bibliometric databases have not comprehensively included books. As noted above, the publication characteristics of the various disciplines in SSH vary significantly. In history, for instance, books can account for as much 'impact' as an economics article in the *American Economic Review*. Thus, while they are more than likely to appear in institutional and national bibliographical databases or lists, books are still under-represented in the current two main bibliometric databases. The problem is not just confined to existing bibliometric databases, but extends to bibliographical lists as well, many of which are of varying quality. All of this poses problems for the robust development and use of citation impact indicators from existing databases. In the next section, we provide an overview of the strengths and weaknesses of the main databases and lists.

## **Strengths and weaknesses of SSH bibliographic databases and lists**

It is worth stressing here the key difference between a bibliographic and a bibliometric database. The main aim of a *bibliographic* database is to aid in literature retrieval (as opposed to assessing research outputs). However, there are some bibliographic databases that allow for a degree of structured bibliometric analysis. For example, ECONLIT, Sociological Abstracts and Psycinfo record author affiliations and cite references, thereby providing some of the data needed for bibliometric analysis. However, these databases all focus primarily on journal articles.

*Bibliometric* databases, in contrast, are used expressly for measurement applications, in particular for research assessment purposes. These databases include details of the references cited, and contain full institutional and author details. They also permit the creation of rather more sophisticated indicators (for instance, citation totals, the average number of citations per publication, numbers of highly cited publications, and the Hirsch index or 'h-index') that can be used to help assess the impact of a body of research output.

The main shortcomings of current SSH bibliographic databases or lists, as identified by Moed et al. (2009), are:

1. a lack of standardisation of author names and institutional affiliations, including the fact that many bibliographic databases list the corresponding address of the first author only;
2. a lack of cited references in source publications;
3. a failure to list all the authors of a multi-authored source publication;
4. differing quality in terms of data capture;
5. uncertainty with regard to the quality criteria used in selecting which outputs to include in (and which to exclude from) the database, which highlights the necessity of robust selection criteria;
6. errors, for example with regard to journal status, including the inclusion of journals that are no longer published, are

suspended or are published irregularly, and journals whose status is unknown.<sup>6</sup>

A few themes are worth elaborating on with regard to these points. Firstly, points 1-4 highlight the necessity of a standardised database structure, including a standardised set of data fields, if the database is to be used for bibliometric purposes. According to Moed et al. (2009), the family of SSH databases within CSA-Illumina<sup>7</sup> exhibit some degree of standardisation but several bibliographic SSH databases are not part of this group. Furthermore, again we find that books are inadequately represented in these databases.

Secondly, an essential condition for a robust bibliometric database is the scholarliness and accuracy of its contents. Yet according to Hicks and Wang, the Web of Science and Scopus journal lists both exhibit certain problems in this respect, in particular, that there is a significant level of non-scholarly literature contained within them. The authors analysed three other Social Sciences and/or Humanities journal lists – the 'Norwegian reference list' (developed at NIFU-STEP, Norway), the European Reference Index for the Humanities (ERIH), and the Australian ERA Humanities and Creative Arts list (ERA HCA)<sup>8</sup> – to see if the same problem existed in these lists. A brief description of each list is given below before discussing Hicks and Wang's findings.

The 'Norwegian reference list' is the list of journals accepted by and submitted in the Norwegian research evaluation process.<sup>9</sup> The list covers all fields of science, social sciences and the humanities. Scholarly publications are defined as "presenting new insights in a form that allows the research findings to be verified and/or used in new research activity in a language and with a distribution that makes the publication accessible for a relevant audience in a publication channel with peer review" (Hicks and Wang 2009, p. 6).

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<sup>6</sup> See Moed et al. (2009) and Hicks and Wang (2009) for a comprehensive list of SSH bibliographic lists and their details.

<sup>7</sup> CSA Illumina provides access to more than 100 full-text and bibliographic databases. The databases cover Arts and Humanities, Social Sciences, Natural Sciences and Technology.

<sup>8</sup> For more details, see Hicks and Wang (2009, pp. 18-20).

<sup>9</sup> For more details on, and problems with, the Norwegian reference list, see Hicks and Wang (2009, pp. 19-20).

Hicks and Wang analysed the Social Sciences and Humanities journals on this list.

The ERIH list claims to cover top-quality European Humanities research published in academic journals in English and non-English languages (including national journals). The list is peer-reviewed by 15 European expert panels, who select and aggregate input received from funding agencies, subject associations and specialist research centres across Europe. A main aim of the ERIH is to enhance scholarly outputs in the Humanities.

The Australian ERA HCA (Excellence in Research for Australia Humanities and Creative Arts) contains 19,500 unique peer reviewed journals to form a draft list of ranked journals. Each journal has a single quality rating and is assigned to one or more disciplines, and the list has been reviewed by discipline-specific experts “to strengthen sector confidence in the accuracy of the journal rankings.”<sup>10</sup> Recently, a range of performance indicators has also been created for 136 disciplines, each of which may choose the indicators that are most appropriate for them. For instance, the Social Sciences have selected a mix of quantitative and qualitative indicators, such as citations and peer review, while the Sciences, not surprisingly, have selected quantitative indicators. Such an approach has gained widespread acceptance from the Australian academic community.

Hicks and Wang’s analysis provides some interesting insights into the claim by all five databases/lists to be based solely on “scholarly refereed material”. For instance, the Web of Science was found to contain 16% of non-refereed and 4% of non-scholarly journals (out of 2,600 SSH items), while Scopus contained 32% of non-refereed journals and 12% of non-scholarly journals, and ERIH 43% of non-refereed and 10% of non-scholarly journals (out of the initial 3,900 humanities journals examined).<sup>11</sup>

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<sup>10</sup> [http://www.arc.gov.au/era/era\\_journal\\_list.htm](http://www.arc.gov.au/era/era_journal_list.htm)

<sup>11</sup> Hicks and Wang (2009) only analysed the initial ERIH list containing the 3900 journals verified in Ulrich’s, and they adopted Ulrich’s definition of what constitutes a ‘refereed’ or ‘non-refereed’ journal. The analysis does not address all the 5200 journals that ERIH now covers, many of which are not published in English.

In summary, the above analysis suggests that no bibliometric database or bibliographic database is 'perfect'. Moreover, despite the widespread criticism of the Web of Science for being too 'Anglo-centric', it remains widely used in many research assessment systems primarily because the articles published in its indexed journals are seen as having reached an internationally recognised standard. As Hicks and Wang (p. 7) note, "Journal editors feel it an honour to meet the criteria for inclusion in WoS [Web of Science]".

## **PART B**

### **Creating the SSH bibliometric database: Key operational and strategic considerations**

In order to establish a possible 'road map' for the creation of an inclusive SSH bibliometric database, we first need to address a number of key issues. In what follows, these have been divided into (1) key underlying considerations; (2) operational issues; and (3) strategic considerations. Examination of these issues will serve to clarify the challenges that the development of a SSH bibliometric database faces, and the range of options that may be adopted to construct such a database are provided in Part C. Careful consideration and selection from among these options will help to facilitate a speedier and more effective implementation, as presented in the Recommendations in Part D.

#### **Underlying considerations**

There are a number of central issues to consider prior to the creation of a SSH bibliometric database. These include the following:

1. The need to raise awareness among research funders, policy-makers and others of the significant length of time required for the development of a SSH bibliometric database, in the same way that bibliometric databases for Science, Technology, Engineering and Medicine (STEM) subjects have evolved over a period of many years.
2. A SSH bibliometric database must allow considerable flexibility in terms of coverage. While initially it may, for pragmatic reasons, focus on scholarly articles and books, over time it will need progressively to bring in more popular books, magazine or newspaper articles and other 'enlightenment literature', 'grey publications' such as policy reports, and (ideally) details of non-published outputs like artwork, exhibitions, excavation reports and photos for assessing SSH impact. Such a database should also allow the creation of different indicators to serve other purposes than those

specified in this Report. Likewise, those indicators should be such that they can be used by individuals, groups, research organisations, etc. for their own assessment or other measurement purposes. Consequently, the imposition of a STEM-like bibliometric database focusing mainly on international journal articles cannot be a solution because of the very different communication modes of SSH researchers.

3. The practicality of attempting to build a SSH bibliometric database from bibliographic lists of institutional and national repositories. This will require that bibliographic lists containing SSH research outputs from publicly funded research and those published in national journals are compiled in a consistent form and are made available to the 'creators' of the new database.

## **Operational issues**

A number of operational principles need to be considered here. One of the most important of these centres on whether to adopt a top-down approach, or a bottom-up approach, or some combination of the two. Let us consider this issue first (addressed in points 1-3 below), before examining other important operating principles (points 4-7 below).

1. **A top-down approach.** This would involve either creating a database at the European (or some other international) level or strong central coordination of national organisations with the establishment of standardised rules in order to ensure full comparability of nationally provided data. A decision is also needed as to who should initiate this process.
2. **A bottom-up approach.** This would entail the producers of existing national bibliographic databases and lists working together to develop common rules and procedures that would result in their respective databases becoming more comparable and, in due course, capable of being integrated in some form. To achieve this would require that the compilers of such national databases work very closely together to ensure convergence towards common standards. As with the above, a decision has to be made for starting the process.

Input from the SSH scholarly communities with regard to the coverage (i.e. the range of research outputs) of these bibliographic databases is also vital in order to ensure full disciplinary involvement and support.

3. **A hybrid approach.** A third possible approach might involve some combination of the above two approaches. For example, a supra-national European organisation might begin by developing a 'bibliometric manual' that would set out the requirements of a SSH bibliometric database, including appropriate definitions, what data are required and in what form, systematic criteria for determining what types of research output should be included and excluded, and so on. The compilers of national bibliographic databases would then be invited to supply data according to those common conventions. Here, too, a decision on who should start the process should be undertaken.

It is worth noting here a possible analogy with the establishment of the first truly comparable data on R&D funding in the early 1960s. In this case, OECD took the lead and, working with international experts, drew up the first 'Frascati Manual', which set out definitions for what was to be included and what data were required. Over time, national bodies made the necessary improvements to their data-gathering processes, and hence the quality and comparability of the data supplied by member states improved. Gradually, more and more countries have come to produce their R&D data according to the Frascati Manual, driven by the incentive that they can then make comparisons with other countries.

In the case of all three of the above approaches, the following questions will need definite answers before a plan of action can be undertaken:

- Who should decide which approach is optimal? Who should initiate the decision-making process?
- Should a European organisation set the standard for the structure of the database?
- What would be the role of European national research councils in standard setting? Would they work together,

or should they be responsible for identifying the European organisation that is going to oversee the task?

- Should an existing international standard be considered, which allows for expansion to include the other inputs that are required for an inclusive SSH database?<sup>12</sup>
- Who is to be responsible for maintaining the database (as this implies a long-term commitment of resources)? Should there be collective funding from national research councils or should the funds come from the European Commission?

4. If they are to provide an input to the European bibliometric database, bibliographic databases/lists need to be able to demonstrate that they include **high-quality national research outputs** that have been validated at a national (or even international) level by leading academics and bibliographic experts. To achieve this, it will again be essential that the respective database compilers talk extensively to each other in an attempt to ensure full comparability of their respective lists of SSH outputs.
5. An essential step is the establishment of a **basic threshold criterion** (or set of criteria) for determining which SSH research outputs are of sufficient quality or importance to merit inclusion. One starting point is consideration of the various criteria currently adopted by national institutions across the various SSH disciplines. (An alternative would be to adopt a 'liberal selection policy' in which SSH academics include as many research outputs as they see fit.) However, the great variety of criteria (both explicit and implicit) currently in use (or new ones created, for example, as a consequence of adopting a liberal selection policy) means it is likely to prove difficult to reach some consensus among the disparate European research councils, institutions and academics. Equally importantly, the pursuit of such a consensus may well delay the start of the SSH bibliometric

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<sup>12</sup> Such a database can be used by governments for metrics and research evaluation without sacrificing the other components in the database.

database. In view of this, it may be sensible to proceed in stages, beginning with a relatively short and simple set of criteria for a range of clearly specified scholarly outputs, and then expanding this with further quality criteria once the initial SSH bibliometric database has been constructed. *In the light of these considerations, a basic or minimum threshold criterion could focus on initially on **scholarly articles in peer-reviewed national and international journals**<sup>13</sup>, and on **scholarly books that have been subject to a peer-review process.***

6. In developing a SSH bibliometric database, we will need to carefully **monitor the various impacts or consequences**, both intended and unintended, on the research process. Any attempt to introduce performance indicators of whatever type may have undesirable effects in terms of influencing what research is undertaken and the kind of outputs that are produced. For example, the use of publication counts in Australia as part of the formula used in distributing research funds to universities resulted in a proliferation of publications in lower quality journals. To avoid this, one may well need to distinguish between higher and lower quality research outputs (as the Norwegians have done in their research assessment process) as well as having threshold criteria for determining the minimum quality needed to be included in the database (see point 5 above). Similarly, an initial focus on international scholarly outputs could result in researchers strategically changing their publishing behaviour to the detriment of production of national language and enlightenment outputs. The risk of such an unintended consequence has to be weighed against the benefit of adopting a pragmatic phased approach to the construction of a SSH bibliometric database.
7. Ideally, there would be merit in commissioning one or more studies on the development of SSH quality or impact

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<sup>13</sup> We are aware that a few high-status journals in the humanities (for example, in philosophy) do not operate a formal peer-review system. However, their editors may instead operate a more informal review system in consultation with colleagues, which may still constitute a form of 'peer review' and therefore entitle them to be included.

indicators. However, in the light of several available and ongoing studies on this issue, it may not be a priority to commission yet another one alongside the implementation of the SSH bibliometric database. Nevertheless, it is **essential that experts on impact assessment techniques and methodologies should be fully consulted during the development of a SSH bibliometric database**. To undertake the development of the database in isolation from studies on these techniques, particularly for the SSH, would be to overlook an important potential contribution to the formulation of appropriate performance and impact indicators for the SSH bibliometric database.

## **Strategic options for development**

Once decisions have been made on the operational issues, there are various strategic options to be considered. These include:

1. Deciding whether the new SSH database should be developed by a European agency or by national governments (through national research councils working with their respective research institutions). Who should make this decision? Alternatively, perhaps a group of research councils, as illustrated by the examples of HERA and NORFACE (ERA-NET projects for the Humanities and for the Social Sciences, respectively) could be considered to spearhead the development.<sup>14</sup>
2. Determining whether, in the light of the commercial competition between existing database providers, one of these might be approached and persuaded to assume overall responsibility for the development of an inclusive SSH database.

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<sup>14</sup> NORFACE is a partnership of 12 European research councils to increase research and research cooperation policy in Europe. HERA is a project formed of 13 research councils aimed at strengthening Humanities research and its 'profile' in Europe. Both projects are funded by the ERA-NET scheme the objective of which is to increase the cooperation and coordination of research activities carried out in the Member States of the European Union.

3. Establishing whether there is any prospect of working with Google Scholar to create a more rigorous bibliometric database. Google Scholar has the advantage in that it already covers books and book chapters. However, at present, there is little or no information on exactly what is included in the Google database, and the data are not sufficiently systematic and rigorous to be used for serious bibliometric purposes. Furthermore, Google Scholar only covers books that are available in whole or in part on the Internet, which remains a significant limitation.
4. Determining whether to support the further development of digital repositories of research outputs in universities and public research institutes by encouraging them to move towards the adoption of common standards and data formats, so that their data can be used as an input to a new European SSH bibliometric database.
5. Deciding whether to build on existing initiatives, drawing on lessons learned. For example, if it is decided that a European organisation is to develop the SSH bibliometric database, then there may well be important lessons to be learnt from the European DRIVER project (Digital Repository Infrastructure Vision for European Research). One could imagine a follow-on project to DRIVER that would build the SSH bibliometric database on the infrastructure already developed by DRIVER.<sup>15</sup>
6. Considering the long-term viability of an SSH bibliometric database and its resource requirements. If a European organisation is to be asked to develop the SSH bibliometric database, then consideration needs to be given to the possible sources of funding. Should this be a collaborative venture of European research councils? Might it be worth approaching the European Commission, perhaps in conjunction with a group such as ESFRI (the European Strategy Forum for Research Infrastructure), for the funding

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<sup>15</sup> The DRIVER project aims to establish an infrastructure of European digital repositories for researchers and the general public (see <http://www.driver-repository.eu/> ).

needed to help enable smaller Member States, in particular, to develop digital repositories and bibliographic databases?

## **PART C**

### **Potential approaches for consideration**

This section provides a synthesis of suggestions by Moed et al., Hicks and Jiang, and the two workshops held in Brighton and Berlin, on how the main challenges identified in the study may be addressed. We present these as a background to the specific recommendations put forward in Part D. The recommendations are thus drawn from a consideration of these suggestions and their implications.

To reiterate, these challenges are:

1. the need to include a wide range of Social Sciences and Humanities outputs, such as books and book chapters, in any new SSH bibliometric database;
2. the need to cover national journals (in different languages apart from English) as well as international journals;
3. the variable coverage and quality of existing Social Sciences and Humanities bibliographic databases and lists from which a new SSH bibliometric database will draw extensively;
4. the lack of a standardised format for the input of data into bibliographic databases and lists, including the problem of listing the affiliations of first authors only. To some extent, this reflects the wide variation in publication and citation practices across the Social Sciences and Humanities disciplines, but without this consistency in data fields, it will be impossible to ensure comparability and to begin to integrate data from these different sources;
5. uncertainty over the quality criteria used in the selection of entries in the different bibliographic databases.

The numbering of the suggestions below is not intended to indicate any sense of priority. In addition, they are not to be seen as mutually exclusive. Each suggestion has a number of advantages and disadvantages (see Box 1 at the end of the six suggestions for a summary of those advantages, disadvantages and implications). As noted above, the recommendations presented in Part D will

select and/or combine the most pragmatic aspects of the suggestions after due consideration of their implications.

## **Suggestion 1**

*Create more comprehensive national bibliographic systems through the development of institutional repositories.*

Moed et al. note that a study conducted in 2006 by Van der Graaf and Van Eijndhoven on European institutional repositories found that only about a quarter of European higher education institutions (HEIs) have created digital repositories of their research outputs. Moreover, among these repositories, it would appear that only just over one third of the research outputs for a given year have been included. Taken together (and even assuming some improvement in the intervening three years), these figures imply that only about 10% of recent publication output of European HEIs is included in institutional repositories.<sup>16</sup> There is therefore considerable scope for this coverage to be extended.

### **Actions Required**

1. Assistance with capability-building for those countries that currently lack the necessary institutional repositories.
2. Help in designing and coordinating the introduction of institutional deposit policies to capture the full range and extent of research outputs (in particular, published books and journal articles) in each institutional repository.<sup>17</sup>
3. Collection of standard bibliographic meta-data for the deposited research outputs across institutional repositories.<sup>18</sup>
4. Encouragement of institutional repositories to begin capturing the cited reference lists contained in the published outputs (to supplement existing citations drawn from scanning international journal articles only).<sup>19</sup>

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<sup>16</sup> Moed et al. (2009), p. 49.

<sup>17</sup> See Moed et al (2009) for more details.

<sup>18</sup> See Moed et al (2009) for more details.

<sup>19</sup> See Moed et al (2009) for more details.

## **Implications**

The main implication here is the vital need for development of the relevant capabilities of institutional repositories, both of which are apparently lacking in the majority of European HEIs. This suggests that such developments may have to be undertaken in tandem with selecting the most practical measure to 'kick-start' the creation of the SSH bibliometric database.

## **Suggestion 2**

*Enhance and build upon existing national documentation systems through the creation and standardisation of institutional research management systems.*

This recommendation is largely aimed at Higher Education Institutions (HEIs) that have developed lists of their research outputs for the purposes of research evaluation, for instance, for submission to a national research assessment exercise. A well designed national documentation research system should allow the flexibility to include not only international journals but other SSH research outputs, such as articles in national journals, books and book chapters.

### **Actions Required**

1. Build upon an existing research information system (e.g. METIS in the Netherlands), in which those submitting the data must specify (a) fields, (b) a list of relevant journals, and (c) some categorisation of journal levels.
  - To ensure that national journals receive the appropriate weight, a separate component within the system for national literature will need to be created for fields in which it is important (i.e. for fields that are not internationally homogeneous in terms of subject matter and approach, but instead focus more on nationally or regionally specific topics). The national journal list, which would need to be validated by national academic experts and academies, would have different criteria for determining the level of journals, and would be assessed separately from the international literature.

Agreed criteria for what constitutes 'peer-review' will also need to be established.<sup>20</sup> There will thus be two interacting but somewhat separate systems.<sup>21</sup> According to Moed et al. (2009), there are existing rules and protocols to build **interfaces** between such separate systems and databases.<sup>22</sup>

2. Expand on an agreed research information system through the **development and application of interfaces** to lists that include books and monographs.
  - For a database of books, this could be built with records that include author affiliation by adopting an international standard, such as the ONIX electronic international standard, which is currently used for representing and communicating book industry product information including author affiliation.<sup>23</sup>
  - Books and monographs, which will (like journals) be assigned to different levels, can be incorporated in a dedicated component from an acceptable and identified list of scholarly publishers agreed and validated by national academic experts and academies.<sup>24</sup>
3. **Or** agree on an existing research information system being used in institutions in the European Union, and then perform tasks (1) and (2) above.
4. **Or build on the DRIVER** initiative (if it is supported for further development and utilisation – see "Strategic options for Development" in Part B), and then perform tasks (1) and (2) above.
5. Link institutional repositories to this research information system.

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<sup>20</sup> See footnote 13 above.

<sup>21</sup> See Hicks and Wang (2009) for more details.

<sup>22</sup> See Moed et al. (2009), p. 51.

<sup>23</sup> See Hicks and Jiang (2009).

<sup>24</sup> This is already being done by the Norwegian model; see Hicks and Wang (2009) for more details.

## Implications

There are three main implications here. The *first* is the development of a research information system for countries that do not currently have one. The *second* is that a minimum threshold criterion be established for the inclusion of selected outputs. The *third* is the possible adoption of a variant or combination of existing database systems, such as METIS, DRIVER or a commercial system, but this requires further investigation including an examination of the possibility of orchestrating some convergence between these alternatives. This, in turn, implies a capability in, or available resources for, the development and implementation of interfaces to enable 'convergence' to take place. Overall, these implications suggest that Suggestion 2 is likely to face considerable difficulties that need to be overcome in the initial stages.

## Suggestion 3

*Create a new database of SSH research outputs from publishers' archives and institutional repositories (articles and books), and (in due course) add to this appropriate data on enlightenment literature and curated events.*

A possible exemplar here is the new database being developed by the Spanish Research Council from publishers' archives.

### Actions Required

1. Create a new database from scratch that includes all publications and citation data obtained directly from publishers.
2. Identify **enlightenment** books and periodicals, perhaps categorised by readership, and then assign levels for this database.<sup>25</sup>
3. List and assign levels for curated events and other **non-textual outputs** for this database, which will be agreed by national experts.<sup>26</sup>

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<sup>25</sup> See Hicks and Wang (2009) for more details.

<sup>26</sup> See Hicks and Wang (2009) for more details.

## Implications

The main implication here is the resource-intensity (time and cost) and complexity of creating and maintaining such a database. This suggests that this may not be a suitable pragmatic measure to 'kick-start' the process of creating a SSH bibliometric database.

## Suggestion 4

*Try to take advantage of the competition between the Web of Science and Scopus to strengthen the coverage of SSH research outputs, and of the potential of Google Scholar to become a more rigorous bibliometric database provider.*

As noted above in Part A, the Web of Science and Scopus are already expanding their coverage of SSH journals, including the introduction of books. Clearly, the main advantage of these two databases is their international acceptance as a source for structured bibliometric analysis. However, Part A has also discussed Google Scholar as a potential supplier of a bibliometric database if improvements are made in terms of transparency, systematisation and rigour. The advantage of Google Scholar/Google Book Search is its uniqueness in being the only database currently covering books as sources of citation links.<sup>27</sup>

## Actions Required

1. Decide on who should approach and explore whether a deal might be negotiated with Thomson-Reuters, Elsevier or Google to ensure not just best value for money (as significant public monies will be involved, for example, in providing the bibliographic lists) but also compatibility with the intended purposes of the SSH bibliometric database.<sup>28</sup>

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<sup>27</sup> Part B, under "Strategic options for consideration", has also offered a suggestion for enticing the company into becoming such a supplier.

<sup>28</sup> Workshop participants and research council representatives were insistent that the purposes of the database be clarified at the outset. NWO representatives commented that what is 'commercially feasible' may be somewhat at odds with what is 'scientifically feasible' with regard to a SSH bibliometric database. Hence it is important that the main purposes of the database should not be compromised in discussions with commercial suppliers, if the latter are approached to help construct the database.

2. Approach Thomson-Reuters (Web of Science) and Elsevier (Scopus) with the idea of expanding their book coverage to include complete bibliographic meta-data on highly cited books, chapters and monographs.
3. Try to find out about Google's future plans regarding the integration of Google Scholar and Google Book Search, then approach Google with the idea of eventually becoming a 'fully-fledged' bibliometric database provider.

### **Implications**

The main implication here is the need for a nominated party who has the extensive knowledge on bibliometrics required to negotiate with the bibliometric publishers.

### **Suggestion 5**

*Integrate the specialised SSH bibliographic lists into one comprehensive bibliographic database.*

As noted in Part A, there are several problems with these specialised lists, not least of which is the absence of a standardised database structure and data fields.

### **Actions Required**

1. Move towards an agreed standardisation of the database structure among the main producers of these bibliographic lists.
2. Examine the existing selection criteria for the sources included in these lists, and how these might be standardised.
3. Introduce books as they are currently very under-represented in the majority of these lists.<sup>29</sup>

### **Implications**

The main implication here is the need for a body of bibliometricians to spearhead the process of standardisation.

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<sup>29</sup> Moed et al. (2009, p. 47).

## Suggestion 6

*Encourage the further development of the Open Access approach, as this offers a potential means to overcome barriers of accessibility and to enhance the visibility of SSH journals and books published by small European publishers.*

The U.S. National Research Council has adopted this model, while some European university presses are engaged in developing an Open Access SSH library. The advantages of such a system are:

- a. It could build on existing schemes to support small European SSH publishers (such as the OAPEN project, which is funded as part of the European Commission “e-Content Plus” Programme).<sup>30</sup>
- b. It would improve the availability and ‘promotion’ of European SSH outputs.
- c. By providing scholars with access to this database, it would help to overcome the accessibility problems posed by a currently rather fragmented publishing industry.
- d. All the electronic items will be indexed by Google Scholar (as is already being done by Google Scholar of all electronic full texts), thereby further facilitating access to European SSH research outputs.
- e. It would provide a revenue source as users would be permitted to read only single pages of the publication, with full publications then being sold relatively cheaply for downloading and saving or for printing.<sup>31</sup>
- f. It would open up the potential for citation analysis, although ‘Open Access’ databases do face certain difficulties because of the content and structure of

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<sup>30</sup> This programme aims to develop and implement an Open Access publication model for SSH books. It uses the DRIVER infrastructure. OAPEN consists of a number of European university presses and universities, such as Amsterdam University, Göttingen University, Manchester University and Firenze University (see Moed et al., 2009).

<sup>31</sup> See Hicks and Wang (2009).

individual repositories, conflict of interests with commercial e-publishers, and so on.<sup>32</sup>

### **Actions Required**

1. **Build and maintain** an electronic full-text SSH journal infrastructure, including the establishment of meta-data fields (author, institution, journal name, etc.).<sup>33</sup>
2. This database will include peer-reviewed journals not on-line and not indexed by WoS and Scopus.<sup>34</sup>
3. Build upon the **OAPEN digital library** and include more European book publishers.
4. Integrate (1) with (3) through the development and application of appropriate **interfaces**.
5. Consider an agreed set of metrics, such as number of downloads or links to related electronic documents.

### **Implications**

The main implications here are (1) the potential redundancy of effort and (2) the potential conflict of interest with the current publishers of bibliometric databases.

Box 1 below summarises the suggestions discussed above. It must be emphasised here that each approach requires a considerable amount of time to develop, the extent of which is difficult to specify as it depends, amongst other things, on the state (quality and

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<sup>32</sup> See Moed et al. (2009, pp. 51-52), who highlight the problem with commercial e-publishers because of the need for an Open Access database to know the download and sales figures of each book. Such data will be hard to obtain. They also argue that it is necessary to obtain library loan figures for books; these, too, are not readily available.

<sup>33</sup> Hicks and Wang do not recommend working with institutional Open Access repositories, mainly because their quality and coverage may be questionable, thus making these lists unsuitable for assessment purposes.

<sup>34</sup> Hicks and Wang, however, recommend a scrupulous *needs-assessment* for this approach because it entails large upfront costs and maintenance in much the same way as any effort to combine existing special SSH bibliographies. In addition, a significant expansion in the coverage of journals and books by the Web of Science and Scopus could render such an Open Access database redundant.

comprehensiveness) of the SSH bibliographic databases and the institutional capabilities for the production of these databases.

**Box 1. Summary of the advantages and disadvantages of each approach**

Suggestions	Advantages	Disadvantages	Implications
1. Create a more comprehensive national documentation system through the development of institutional repositories.	Provides opportunities to countries with inadequate skills to develop comprehensive institutional bibliographic lists and a national documentation system.  The data could be harvested for the SSH bibliometric database.	Identify which countries – what selection criteria for identification? Need ‘political will’ to design policies to develop lists and national documentation system. Resource-intensive. Time-intensive as have to start from ‘almost scratch’. Will likely slow down the development of the SSH database.	The vital need for development of bibliometric capabilities and of institutional repositories, both of which are apparently lacking in the majority of European HEIs. This suggests that such a measure may have to be undertaken in tandem with selecting the most practical measure to ‘kick-start’ the creation of the SSH bibliometric database.
2. Enhance and build upon existing national documentation systems through the creation and standardisation of institutional research management systems.	A well designed national documentation system should have the flexibility to include a range of SSH outputs.  Enhances the possibility of integrating national institutional repositories.	Aimed at HEIs that already have institutional bibliographic lists. Potential difficulty in arriving at consensus on which institutional research management system to adopt. Excludes HEIs that have not developed a national documentation system AND bibliographic lists.	The <i>first</i> is that a minimum threshold criterion be established. The <i>second</i> is the possible adoption of a variant or combination of existing systems, such as METIS, DRIVER or a commercial system, but this requires further investigation including an examination of the possibility of orchestrating some convergence between them.
3. Create a new database of SSH research outputs from publishers’ archives and institutional repositories (articles and books) and (in due course) add to this data on enlightenment literature and curated events.	New database from publishers’ archives is already being created by Spain – showing that it can be done.  Allows for a wide range of SSH outputs.	Resource-intensive. Time-intensive. Need standardisation of institutional lists. Risk of ‘reinventing the wheel’?	The main implication here is the resource-intensity (time and cost) and complexity of creating and maintaining such a database. This suggests that this may not be a pragmatic measure to ‘kick-start’ the process of creating a SSH bibliometric database.

Suggestion	Advantages	Disadvantages	Implications
<p>4. Try to take advantage of the competition between the Web of Science and Scopus, and the potential of Google Scholar to become a rigorous bibliometric database provider.</p>	<p>Web of Science and Scopus have international acceptance in terms of their use for structured bibliometric analysis.</p> <p>Google Scholar is the only database that comprehensively covers books; it is easy to find book references; and it collects simple citation indicators. Currently used for 'desk-top bibliometric analysis'.</p> <p>Promotes competition.</p> <p>Likely to be most cost-effective solution, depending on negotiated terms for production and public usage.</p> <p>Accelerates the creation of SSH bibliometric database.</p> <p>Maintenance of database more assured.</p>	<p>Google Scholar's current business model is non-transparent; its multiple sources are still unknown; its records are not usable for structured analysis; and there is concern about the accuracy of the citation links.</p> <p>Who negotiates the 'deal' to ensure value for money for the users (as public resources will be incurred) and commercial publishers?</p>	<p>The main implication here is the need for a nominated party with extensive knowledge of bibliometrics to negotiate with the bibliometric publishers.</p>
<p>5. Integrate the specialised SSH bibliographic lists into one comprehensive bibliographic database.</p>	<p>Some specialised bibliographic databases, such as the family of CSA-Illumina databases, already have a standardised database structure.</p> <p>These databases cover specific (sub-)disciplines.</p> <p>Many of these databases are accessible through a common interface.</p>	<p>Time-intensive.</p> <p>Resource-intensive – major effort needed to standardise and de-duplicate these databases for bibliometric analysis and for maintenance of database.</p> <p>Who maintains the database?</p> <p>High risk of redundancy, especially if Web of Science and Scopus continue expanding their databases.</p> <p>Unclear selection/quality criteria for inclusion of outputs.</p> <p>High incidence of absence of institutional affiliations of publishing authors.</p> <p>Stark under-representation of books.</p>	<p>The main implication here is the need for a body of bibliometricians to spearhead the process of standardisation.</p>

Suggestion	Advantages	Disadvantages	Implications
<p>6. Encourage the further development of the Open Access approach, as this offers a potential means to overcome barriers of accessibility and to enhance the visibility of SSH journals and books published by small European publishers.</p>	<p>The use of public money to support small European SSH publishers.</p> <p>Facilitates the availability, accessibility and 'promotion' of European SSH outputs.</p> <p>Facilitates easier access and helps to overcome the accessibility problems posed by a fragmented publishing industry.</p> <p>A revenue source, as users are permitted to read only one page of the article, so full articles need to be purchased for downloading.</p>	<p>Resource-intensive for standardisation because of variability in the structure and content of the national institutional bibliographic lists and high maintenance costs of database.</p> <p>Difficult to arrive at standardisation.</p> <p>Time-intensive.</p> <p>Conflict of interest with commercial publishers – need to know the download and sales figures of commercial e-publishers.</p> <p>Need to know loan figures for each book, or each article from libraries, which are seldom available.</p> <p>Who maintains the database?</p> <p>High risk of redundancy, especially if Web of Science and Scopus continue expanding their databases.</p>	<p>The main implications here are the potential redundancy of effort and conflict of interest with the current publishers of bibliometric databases.</p>

## PART D

### **Recommendations for the development of a comprehensive SSH bibliometric database**

To reiterate, the SSH bibliometric database is intended to fulfil a number of functions:

1. to provide accountability with regard to the use of public funds;
2. to assess research quality and to permit the development of performance indicators;
3. to provide a comprehensive overview of SSH research outputs in Europe;
4. to map the directions of SSH research, indicating, for example, which areas are under-researched, or which exhibit an established research capacity and which are lacking this;
5. to identify new emerging areas of interdisciplinary SSH research.

Given the above objectives and the desire of research councils to initiate the construction of a SSH bibliometric database in a timely fashion, we advocate that the development of a comprehensive SSH bibliometric database be carried out on the basis of **four** recommendations. These involve:

1. defining the criteria for inclusion of SSH research outputs and establishing a standardised database structure for national bibliometric databases;
2. exploring the option of involving a commercial supplier in the construction of a single international SSH bibliometric database;
3. conducting a pilot study of one or more specific SSH disciplines;
4. longer-term expansion and enhancement of the SSH bibliometric database.

For each recommendation, a **hybrid approach** is commended based on **a combination of top-down and bottom-up actions**, with the emphasis on extensive bottom-up involvement in the

production and development of the bibliographic databases and lists that will then underpin the SSH bibliometric database. Practicality of implementation and cost-effectiveness are the two main criteria underlying the choice of the recommendations that follow.

This part of the report presents the four main recommendations, for each of which we lay out a series of actions. The recommendations here, as noted in Part C, combine various aspects from the suggestions presented there.

Recommendations 1 and 3 may be undertaken in parallel in order to save time. Such a decision to conduct them in tandem, however, will depend on the views of the research councils or organisations charged with the task of creating a SSH bibliometric database and the resources they are able to make available. Recommendation 2 can only commence after significant progress has first been made with Recommendation 1. Likewise Recommendation 4 is probably best left until Recommendations 1 and 3 have been largely completed so that the insights gained into what other research outputs and indicators need to be considered, particularly for the Humanities, can be fully taken into account.

After due consideration of the substantial difficulties and large upfront investment highlighted by the two commissioned studies, we have decided not to recommend pursuing certain of the options presented in Part C for reasons of practicality and cost-effectiveness. Those not pursued here are (i) the Open Access approach; (ii) the integration of specialised SSH bibliographic lists; and (iii) the creation of a new database of SSH research outputs from publishers' archives and institutional repositories (see Part C above for a discussion of the difficulties inherent in each of these suggestions and Box 1 for a summary of their respective advantages, disadvantages and implications).

We suggest that a hybrid approach (i.e. a combination of 'top-down' and 'bottom-up') be adopted with regard to each recommendation. A hybrid approach is likely to prove most cost-effective as it should ensure that the coordination, comparability and integration of the respective databases are achieved without incurring unnecessarily heavy additional cost to countries that have already invested significant resources in national bibliographic databases. A hybrid

approach also would seem to offer the best of both worlds, with impetus, guidance and 'clout' being provided by the top, and expertise, inputs (providing and validating content) and feedback coming from the bottom.

## **Recommendation 1: Define the criteria for inclusion of SSH research outputs and establish a standardised database structure for national bibliometric databases**

This recommendation focuses on (1) the establishment of the minimum criteria for the inclusion of scholarly peer-reviewed articles and books, and (2) the creation of a standardised structure for the various national bibliometric databases so that they provide comparable data across countries. The achievement of this will be underpinned by five key components:

1. strong coordination and close working between national organisations, in particular research councils and institutional repositories, to provide the necessary impetus for the development of internationally comparable bibliographic databases/lists and their gradual transformation into full bibliometric databases;
2. bottom-up involvement of national institutions and repositories in consultation with bibliometric experts, users and SSH scholars on the provision, validation and development of the eventual bibliometric databases;
3. resources being made available to national institutions and repositories that have inadequate capabilities to develop bibliographic databases/lists into full bibliometric databases.
4. in order to avoid the process of data collection getting out of control and to ensure the harmonisation of collected data among the involved countries, the definition of the standardised structure must be established at the outset as any subsequent changes<sup>35</sup> to it will prove extremely costly;

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<sup>35</sup> Subsequent structural changes, such as including new meta-data in later phases will incur disproportionate expenditure of labour, time and costs.

5. Important meta data<sup>36</sup> should be included even if they are not used in the initial phase of database utilisation.

## **Actions Required**

### *Top-down*

- In order to ensure consistency of criteria and standardisation of practice and to avoid many of the operational pitfalls discussed in Part C, as well as to provide the necessary 'platform' or infrastructure on which the other recommendations will build, the following **actions are recommended**:
  - That a small group of research councils from a diverse range of (large and small) Member States<sup>37</sup> should take the lead in setting in motion the process of standardisation and the establishment of the minimum criteria for inclusion of research outputs in a SSH bibliometric database. (These are hereafter referred to as 'the lead research councils'.)<sup>38</sup>
  - That the lead research councils should seek to expand the composition of this group incrementally, for instance, by including the Norwegian Research Council (given that its SSH bibliometric database was favourably reviewed by Hicks and Jiang) and others, in order to 'keep up the momentum' of development so as

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<sup>36</sup> Such meta-data included in contemporary 'bibliometric' databases are, for instance, references, all authors/editors/contributors, full affiliation/address information, author-affiliation assignment, and acknowledgments including funding information. In the light of a major initiative forthcoming from CrossRef to obtain a Universal Researcher ID, which will take over the Thomson-Reuters and Scopus researcher IDs, the metadata should also include Researcher ID.

<sup>37</sup> This could follow the examples of HERA and NORFACE [NWO] (See point one under Section on "Strategic Options" in Part C for an explanation of NORFACE and HERA).

<sup>38</sup> Although a larger lead group of research councils would allow for broader coverage in terms of participation and diversity, the Board Members have in the majority agreed that, for practical reasons, a smaller group of research councils is needed to kick off the process, while clearly recognising that participation from other research councils will also be necessary, as explained in the subsequent bullet point. However, as the process gets underway and gains momentum, we fully expect the group of 'lead research councils' to expand so as to reflect the full diversity of European research traditions, cultures and languages.

to eventually include all EU Member States, and so as to avoid the danger of producing a distorted picture of the diversity of research traditions and cultures as exist in different European member states.

- That the lead research councils appoint **a standard-setting body**, which will include a combination of expert bibliometricians and library or documentation experts (from Europe and elsewhere, in particular, those familiar with the specificities of SSH research), and SSH researchers to ensure that, in setting the standards, there is due consideration of different disciplinary communication modes. Some of those library/documentation experts might be selected from Higher Education Institutions (HEIs) that already have advanced documentation systems and are experienced in the production of lists of research outputs for various purposes, such as research evaluation or the regular monitoring of research performance.

While it is clearly not possible to include a researcher-representative from every SSH discipline, the standard-setting body must endeavour to establish close collaboration with SSH researchers not represented in the standard setting body. This could, for example, be done via research councils along similar lines to NORFACE and HERA, who could then incorporate the gathering of such inputs into their activities. The research councils would then communicate the inputs to the standard-setting body.

This standard-setting body will be responsible for setting the standard for the structure of SSH bibliometric databases and for establishing the criteria for the inclusion of articles and books (and, in due course, other research outputs). The purpose of this action is to expedite the formation of a standard based in large part on an examination of different information management systems, such as METIS, DRIVER or a commercial structure (for instance, ONIX in the case of

books), to see if some orchestrated convergence or adaptation of these systems is possible.

- That the standard-setting body should act autonomously, but should actively consult with a range of SSH scholars as well as with experts on bibliometrics and impact assessment techniques, commercial database suppliers and national repositories.
- That the standard-setting body will establish the **minimum criteria** for inclusion in the SSH bibliometric databases, which could, as a pragmatic measure, begin with (1) scholarly articles from peer-reviewed international and national journals; (2) books that have undergone a similar peer-review process prior to publication.<sup>39</sup> This exercise will be accompanied by extensive consultation with SSH scholars, including European and national scientific and research associations in the different SSH disciplines covered by the group of lead research councils. This consultation will be repeated as the SSH database expands to include other Member States.
- As a possible alternative to the above minimum criteria, the standard-setting body will identify a group of leading HEIs with extensive experience in setting up bibliographic databases/lists to help determine appropriate common criteria for the inclusion of SSH articles and books. As with Point (2) above, close consultation with the SSH communities is again strongly recommended.
- That the standard-setting body, in consultation with external bibliometric experts, commercial database suppliers such as Thomson-Reuters and Scopus, Proquest/Cambridge Scientific Abstracts (and non-

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<sup>39</sup> Caution with regard to publishers will need to be exercised. According to some Spanish academics, certain leading Spanish publishers are charging authors for publication of their books. Authors who refuse to comply with the charges may therefore not be published. This raises the question of peer-review or the quality of the books.

commercial ones such as CABI) and SSH researchers (from the countries of the research councils leading the effort including those who join subsequently), will also consider what 'book metrics' are required.

- That the standard-setting body, in consultation with national repositories and SSH scholars associated with the research councils leading this initiative, will decide the time-frame for including journals – in particular, how far back they wish to go.<sup>40</sup>
- That the standard-setting body establish a realistic time-frame required for the identification of peer-reviewed journals and books for inclusion into the database. This time-frame will be established **after** the structure of the standard has been completed.
- That resources are sought for national institutions or repositories that currently lack the capability to develop a bibliometric database. Although this capability will be required for the SSH bibliometric database that will eventually include all European Union Member States, we **recommend** as a preparatory measure that
  - all EU national research councils and the ESF present a case to the European Commission to make 'structural funds' available for this task. Alternatively, a case for such funding could be made to the European Commission in conjunction with the European Strategy Forum for Research Infrastructure (ESFRI).
- To oversee and manage the project, and initially maintain the SSH bibliometric database, we **recommend**
  - that the group of lead research councils appoint a project manager from among themselves;

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<sup>40</sup> Over time, some journals cease publications while other new ones appear, so a pragmatic decision will be needed as to how far back the SSH database should extend, at least in the first instance.

- that the project manager set up a committee comprising representatives from the group of lead research councils and assign tasks to each committee member;
- that the project manager and committee submit progress reports to their respective research councils (or equivalent) and funders on a half-yearly basis;
- that the project manager and committee consult with experts in impact assessment techniques and methodologies;
- that the project manager should initially maintain the database but should, with the committee, determine the resources required for the maintenance of this in the longer term, where the funds should be obtained from, and time frame for making this transition.

*Bottom-up*

- National institutions and institutional repositories of the countries of the lead research councils will be responsible for applying the agreed minimum criteria to their bibliographic databases as they begin to transform them into full bibliometric databases.
- National institutions and institutional repositories, in close consultation with the national SSH communities, will be responsible for the identification of high quality peer-reviewed national or regional journals and books.
- Each national institution or repository of the countries represented by the lead research councils will be responsible for ensuring that the standard decided by the standard-setting body for structuring the bibliographic databases is then implemented so that over time they are transformed into comparable bibliometric databases.

## **Recommendation 2. Explore the option of involving a commercial supplier in the construction of a single international SSH bibliometric database**

The construction of the SSH bibliometric database by a commercial supplier may prove to be a particularly cost-effective measure, given that Thomson-Reuters (publishers of the Web of Science) and Elsevier (publishers of Scopus) are both established bibliometric database suppliers, while Google Scholar/Google Books already covers a range of books in its database.

This recommendation is underpinned by three key components:

1. obtaining the necessary 'buy-in' from national organisations, in particular research councils, to provide the impetus and funding (either directly from themselves, or indirectly, for example, through the European Commission) for such an initiative;
2. ensuring strong coordination between those national organisations so that the commercial suppliers can be approached with a clear and common goal;
3. stimulating the bottom-up development of lists and bibliographic databases by national institutions or repositories in a process in which national bibliometric experts and users and SSH scholars are all closely involved in providing and validating the content of these lists, with those lists then being passed over to the commercial developer of the SSH bibliometric database.

### **Actions required**

#### *Top down*

- Decide on how best to approach Thomson-Reuters (Web of Science), Elsevier (Scopus) and perhaps also Google with a view to exploring a possible deal. We **recommend** that
  - that the chair of the standard-setting body be the chief negotiator for this action, under the auspices of the lead research councils;

- that the chair of the standard-setting body consult with institutions or individuals that have previously dealt with Thomson-Reuters, Elsevier and Google, such as Tony van Raan (CWTS), Felix de Moya (SCImago)<sup>41</sup>, Lorraine Estelle (Joint Information Systems Committee – JISC Collections)<sup>42</sup>, Graeme Rosenberg (Higher Education Funding Council of England, HEFCE), and Ana Maria Prat (the National Commission for Scientific and Technological Research, CONICYT)<sup>43</sup>, for information on their experiences in dealing with these commercial suppliers.
- Decide whether the commercial suppliers should be asked to ‘clean up’ existing bibliographic databases and lists and incorporate them into their existing bibliometric databases; OR whether commercial suppliers should instead be invited to construct a new database (focusing on national journals and different languages, and books) to complement their existing database (focusing on international journals). We **recommend** that
  - **both options** be presented to commercial suppliers for pricing. Depending on the price difference between the two options (that is, if it is not large), it is preferable to select the incorporation option as many institutions already have extensive bibliographic databases/lists.

### *Bottom up*

- National institutions and institutional repositories will be wholly responsible for the creation of their respective bibliographic databases/lists and possibly the eventual

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<sup>41</sup> Felix de Moya was one of the authors of the commissioned study led by Henk Moed, and he works extensively on Scopus.

<sup>42</sup> JISC is funded by the UK HE and FE funding bodies to provide world-class leadership in the innovative use of ICT to support education and research. JISC manages and funds more than 200 projects within 28 programmes. Outputs and lessons are made available to the HE and FE community. JISC also supports 49 Services that provide expertise, advice, guidance and resources to address the needs of all users in HE and FE. See <http://www.jisc.ac.uk/whatwedo.aspx>.

<sup>43</sup> Ana Maria Prat attended the project workshop held at SPRU on 18 March 2009. Her institution has dealt with Google on a bibliographic database for her institution.

transformation of these into bibliometric databases. Note that even if the option eventually chosen is for the commercial supplier instead to construct a new bibliometric database, bibliographic lists will still be required for handover to that commercial supplier.

- National institutions/repositories should consult with a broad range of SSH researchers to ensure the quality and validity of their respective bibliographic lists.

### **Recommendation 3. Conduct a pilot study on one or more selected SSH disciplines**

As SSH disciplines exhibit quite different communication modes, there would be merit in conducting a pilot study focusing on one or more selected SSH disciplines and collecting data on the relevant research outputs that should be included in a bibliometric database aimed at serving the five main purposes highlighted in this scoping study. The task of how best to construct appropriate quality or impact indicators could also be addressed. The pilot study should try to reflect ideas on the standard emerging from the implementation of Recommendation 1, and could be undertaken in parallel with Recommendation 2.

#### **Actions required**

##### *Top down*

- The group of lead research councils should decide on the **SSH discipline(s)** and **countries** that will be the focus of the pilot study. Examples of SSH disciplines that might be candidates include history, geography, linguistics and philosophy.<sup>44</sup> The choice of the disciplines will be made by the research councils within the lead group that have the necessary resources to fund the pilot studies.

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<sup>44</sup> Several participants at the Berlin workshop argued that there needed to be a particular focus on the Humanities, where more work needs to be done on bibliometrics, given that their communication and publishing modes (for instance, the much greater emphasis on books) differ more from the Social Sciences and from STEM subjects.

- The group of lead research councils should decide whether this pilot study should be carried out and, if so, how it is to be funded. For example, it might be undertaken by 'volunteer' institutions in the selected countries. We **recommend** that
  - a fee' be made available to these institutions;
  - an invitation to research institutions/HEIs of the selected countries be issued, after which the group of lead research councils will select the candidates to conduct the pilot study;
  - if the funding for such a fee is not available, then an invitation for 'volunteers' will be issued to **selected leading HEIs across Europe** that possess substantial experience in constructing bibliographic databases;
  - a timescale for delivery of the bibliometric database will be set of around 12 months.

*Bottom up*

- The institutions selected to conduct the pilot study will engage in full consultation with SSH researchers in determining the data coverage and appropriate performance indicators.
- The institutions selected will consult experts on impact assessment techniques and/or studies dealing with these techniques.
- The institutions selected will have the capacity to construct the bibliometric database and to deliver it within a timescale set by the group of lead research councils.

## **Recommendation 4. Longer-term expansion and enhancement of the SSH bibliometric database**

This recommendation corresponds to the last part in the long journey toward the construction of a fully inclusive international SSH bibliometric database. It focuses on the gradual inclusion of other SSH outputs (that is, in addition to peer-reviewed articles and books).

As with the above three recommendations, this recommendation involves a hybrid approach, and it will build on what has been achieved in Recommendations 1 and/or 2 and 3.

This recommendation is underpinned by four key components:

- ensuring that there is a consensus among the lead research councils as to what other SSH research outputs are to be included in the expanded SSH bibliometric database;
- working in close communication with experts in impact assessment techniques for SSH so that the process of development of the SSH bibliometric database is not undertaken in isolation from other work on SSH impact assessment techniques and methodologies;
- deciding on what research outputs can best capture economic and social impacts;
- agreeing on other impacts that they wish to capture from the full range of SSH research outputs in order to inform the construction of appropriate research output data and indicators that best reflect the needs and interests of the full range of SSH disciplines.

### **Actions required**

#### *Top down*

- A preliminary decision needs to be made on who/what institution is to be responsible for subsequently maintaining the SSH bibliometric database (as this implies a long-term commitment of significant resources). We suggest<sup>45</sup> that:
  - collective funding from national research councils be used to underwrite the maintenance of the SSH bibliometric database;
  - alternatively, the consortium of lead research councils and the ESF should approach the European Commission (perhaps in conjunction with the European Strategy

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<sup>45</sup> Unfortunately, the scope of the work carried out by the Project Board is such that we are unable to make very specific recommendations here, particularly with regard to the likely costs.

Forum for Research Infrastructure) to seek long-term funding for the SSH bibliometric database;

- then an Invitation to Tender should be issued by the lead research councils for the further development of the international bibliometric SSH database (this presumes that Recommendation 2 has not been pursued with commercial providers or has proved unsuccessful).
- The new standard-setting body (see Recommendation 1) should develop research output indicators and criteria for inclusion of a range of other SSH outputs (i.e. other than scholarly articles and books). We **recommend**
  - that monographs and 'grey' and 'enlightenment' literature should be the among the first items to be included in this expanded SSH bibliometric database, as well as other important research outputs identified from the pilot study<sup>46</sup>;
  - that the standard-setting body identify a select **group of leading HEIs experienced in the production of bibliographic databases** to help determine appropriate criteria and indicators, including those suggested from the pilot study, as they will have valuable experience in dealing with the unforeseen problems that will inevitably occur in the long-term development process of database construction;
  - that the standard-setting body also seek inputs from **HEIs experienced in collecting systematic information on the production of non-textual outputs**, as they should have valuable insights into what non-textual outputs should/could be included in the inclusive SSH bibliometric database;
  - that the standard-setting body also consult with commercial suppliers and bibliometrics experts about

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<sup>46</sup> This presumes that Recommendation 3 for a pilot study on specific SSH disciplines has been implemented.

the creation of a wider range of SSH research output indicators.

- that the standard-setting body consult with experts on impact assessment techniques for SSH, who could provide valuable suggestions for appropriate impact (or 'quality') indicators, such as those for social and economic impact.

#### *Bottom up*

- National institutions and institutional repositories will adopt the various SSH research outputs identified by the standard-setting body (see above) and produce systematic databases/lists of these outputs;
- National institutions and institutional repositories will comply with the criteria established for inclusion of the identified SSH outputs in the production of their databases/lists of these outputs, which will then be supplied to the developer of the international SSH bibliometric database.

For a graphical presentation of the recommendations and timescales, see Annex 3.

The above four recommendations would appear to offer the best way forward in exploring and then establishing an international bibliometric database for the Social Sciences and Humanities. The hybrid approach outlined, because it involves various stages, provides the opportunity to curtail the process at any point if the problems prove to be intractable or excessively expensive to overcome. It also assumes that the prospects of success will be greater if the initiative starts with a relatively small group of research councils and countries, allowing others to join in subsequently as momentum builds and as the necessary resources become available.

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## **Annex 1**

### **Towards a Bibliometric Database for the Social Sciences and Humanities – A European Scoping Project**

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## **Annex 2**

### **Options for a Comprehensive Database of Research Outputs in Social Sciences and Humanities**

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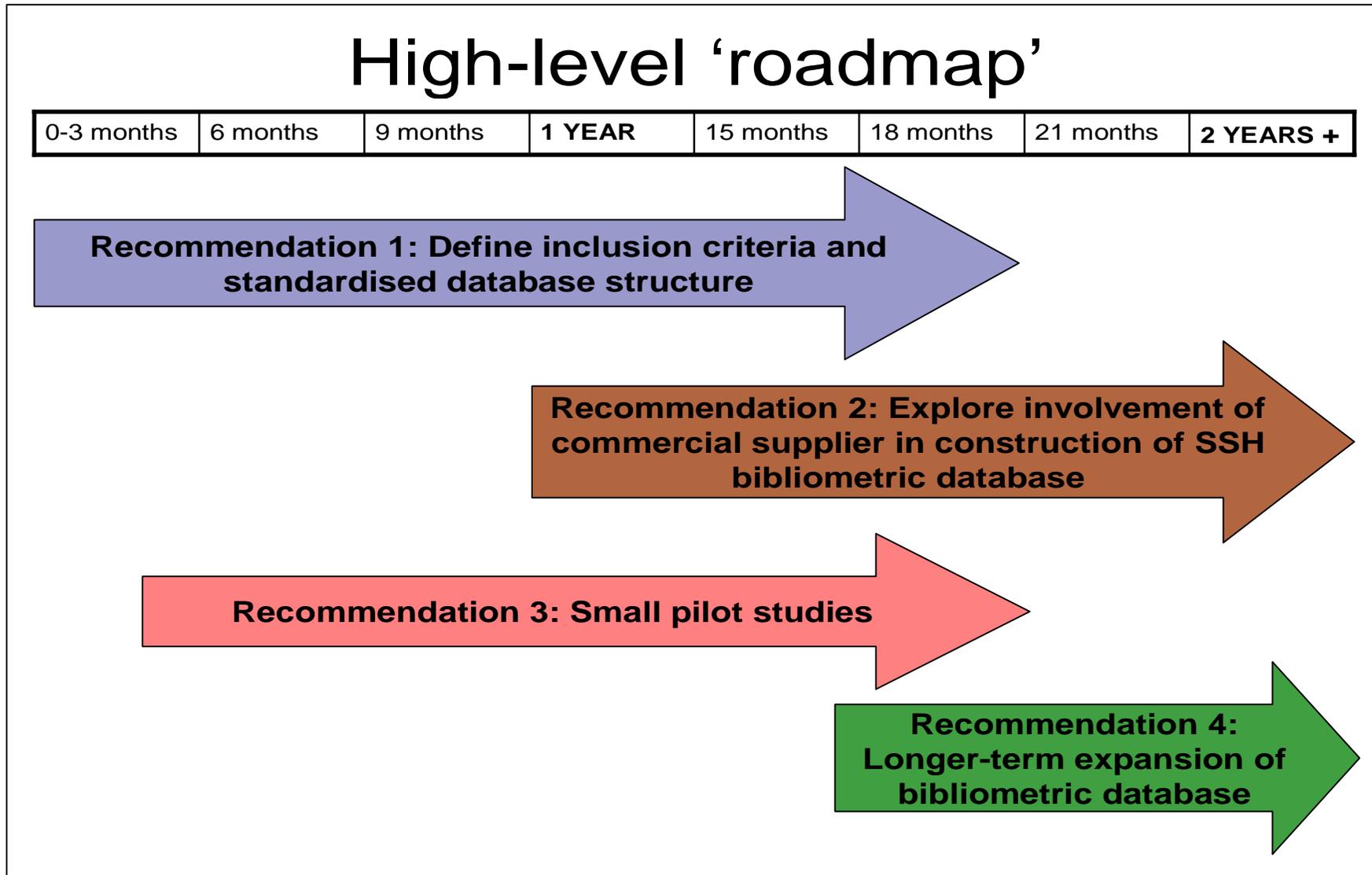
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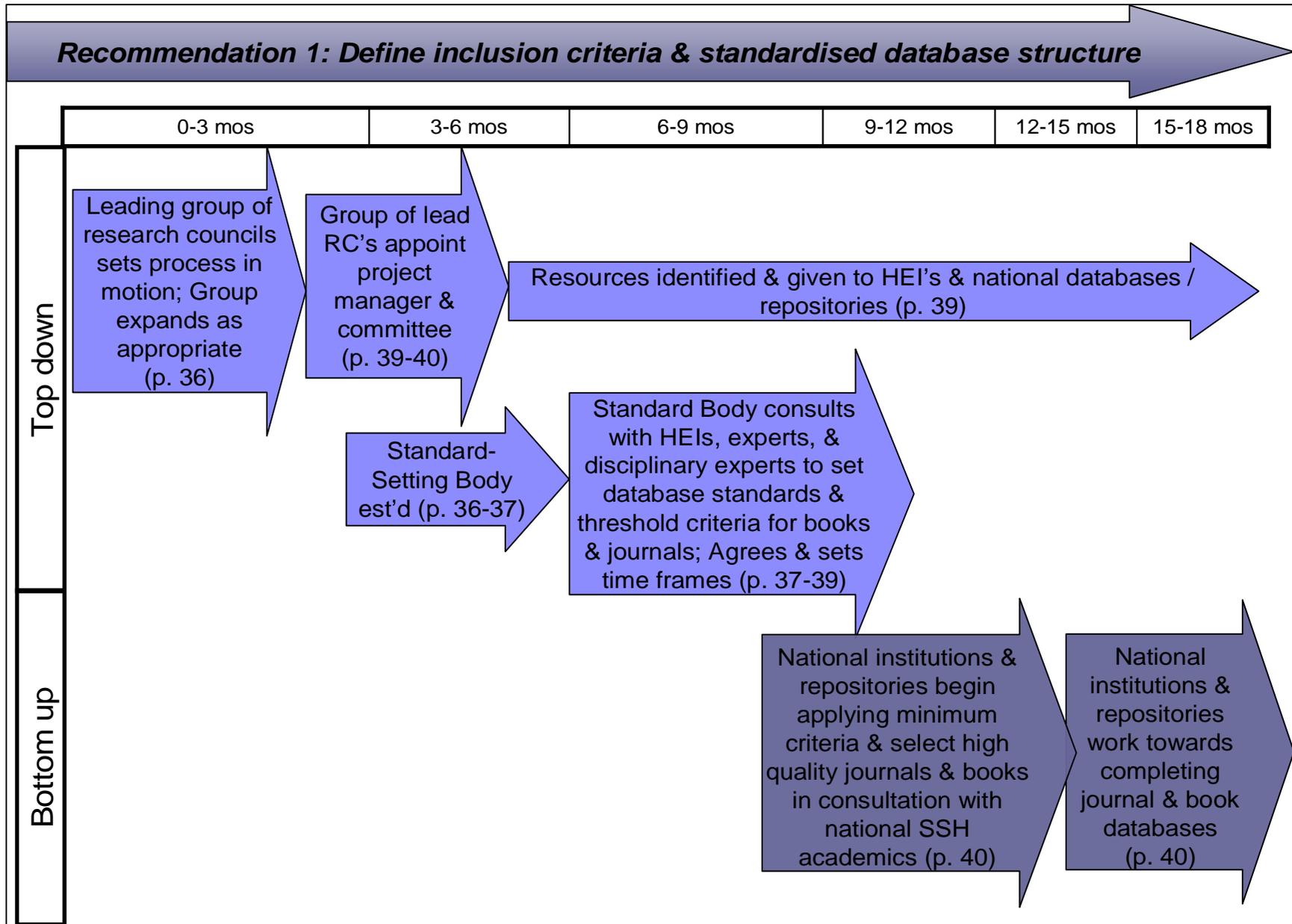
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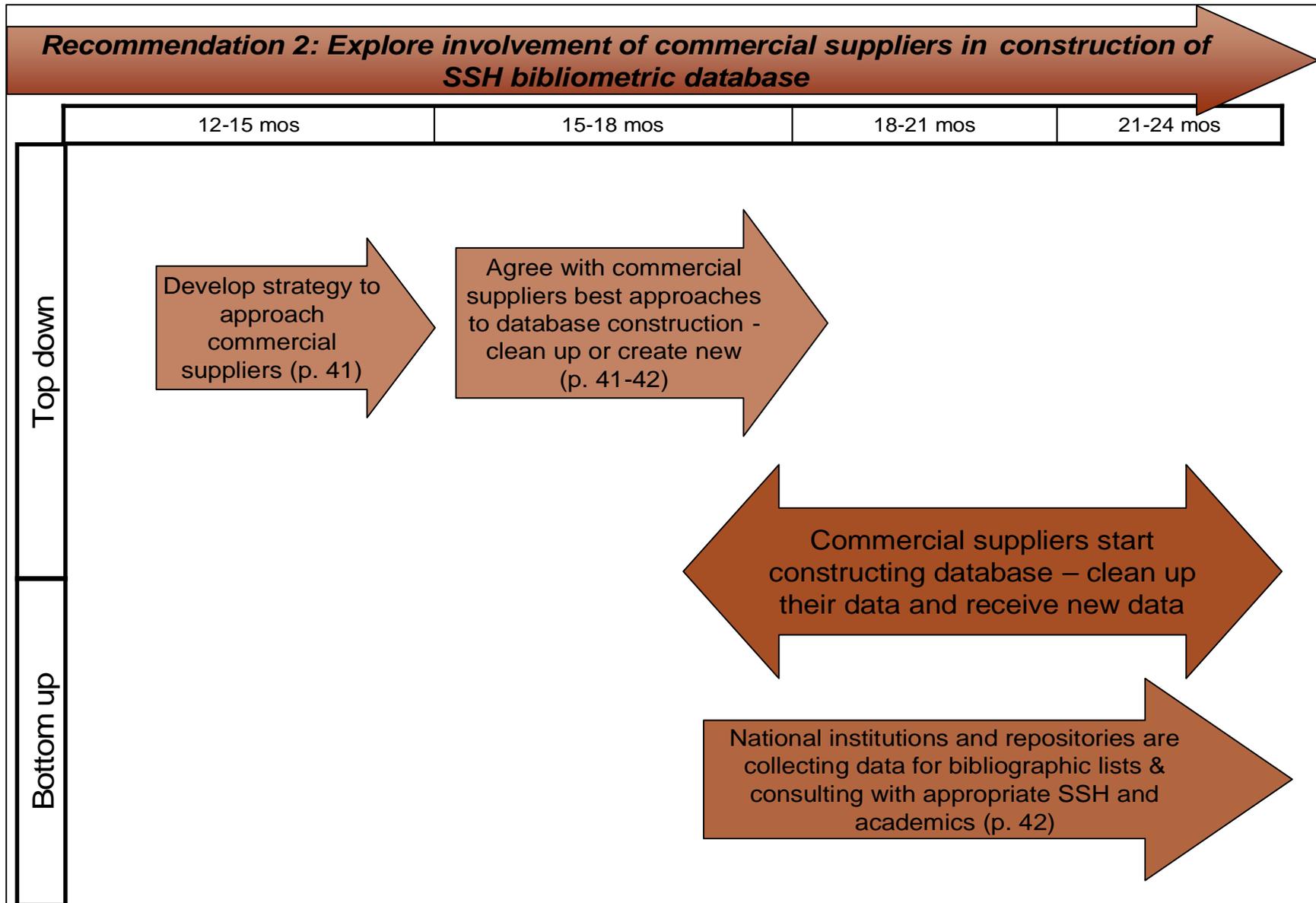
SCIMago Research Group, CSIC Madrid and University of Granada,  
Spain

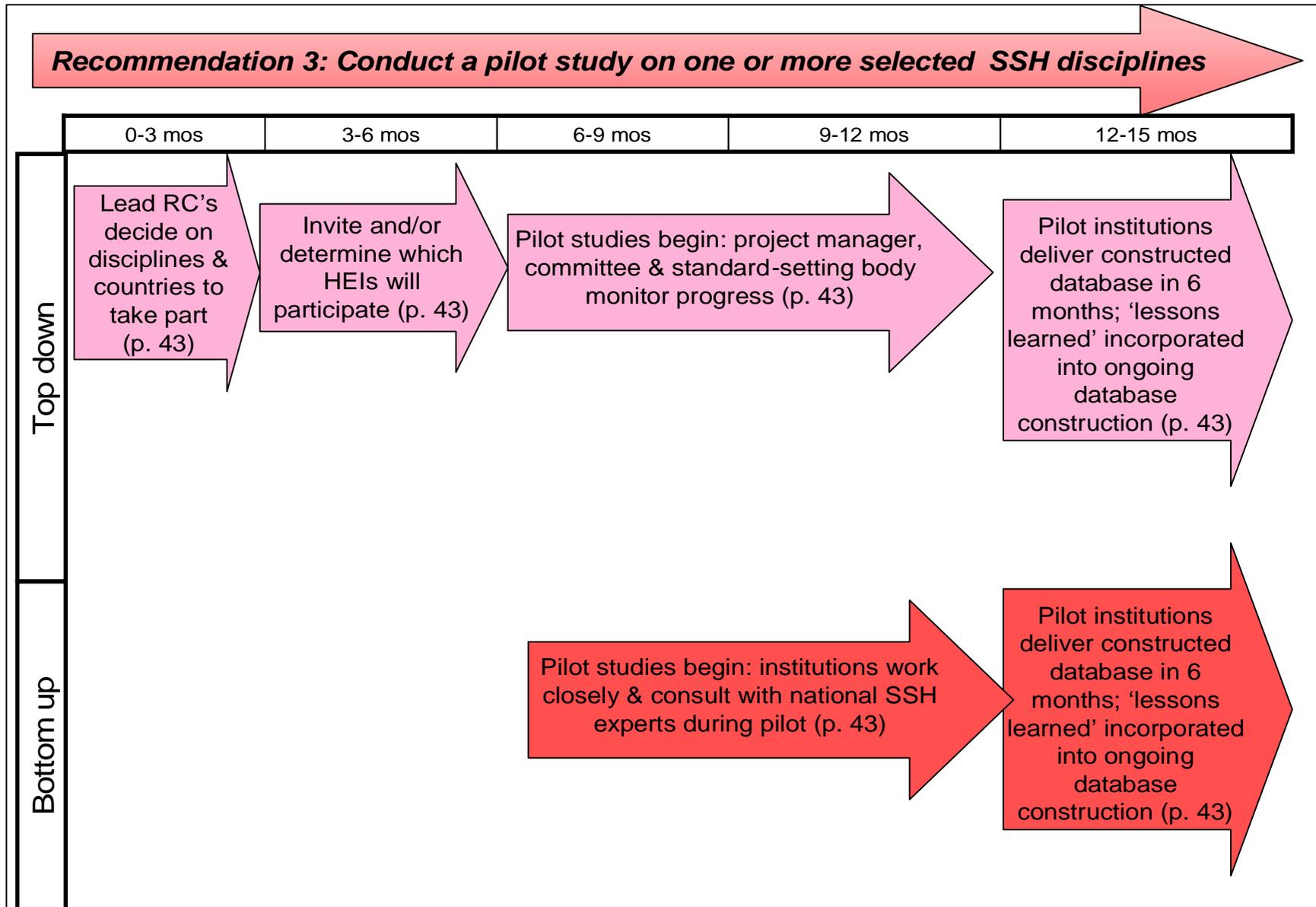
Research report to the Project Board of the Scoping Study 'Towards a Bibliometric Database for the Social Sciences and the Humanities' set up by the Standing Committees for the Social Sciences and the Humanities of the European Science Foundation (ESF)

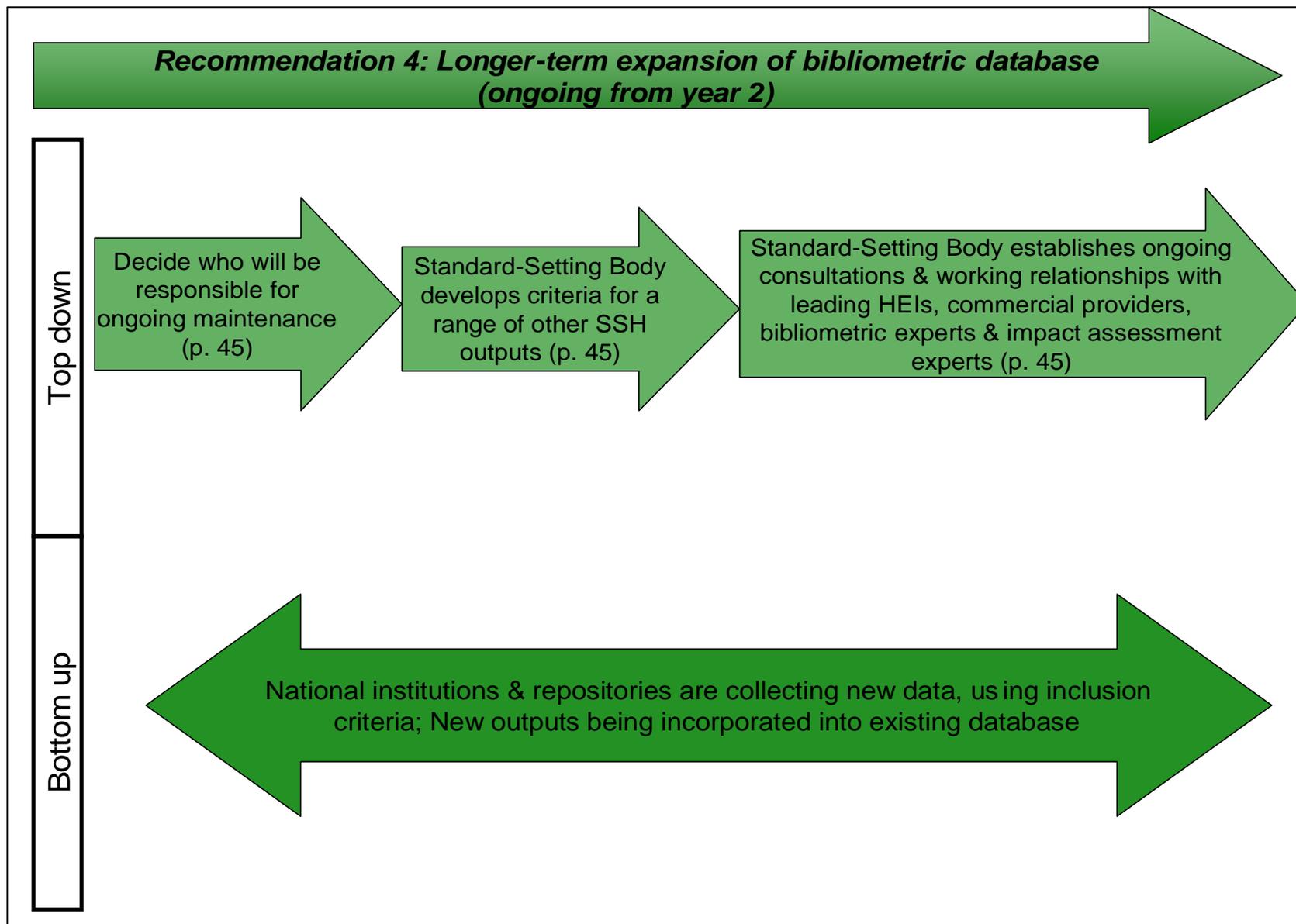
## Annex 3 – Roadmaps











# Towards a Bibliometric Database for the Social Sciences and Humanities – A European Scoping Project

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April 2009

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## Executive Summary

In the social sciences, humanities or arts it is largely impossible to substantiate statements on research excellence with reliable indicators for international benchmarking of fields and institutions. To help overcome this limitation, this report examined bibliometric systems in the social science and humanities from the perspective of assessing their potential for institutional research evaluation nationally or internationally.

To assess the feasibility of an adequate bibliometric system in SSH, we must ask: how large is the SSH literature and how much of it should be counted in an evaluation? Working with limited time and resources, our efforts focused on assessing international and national journal literature using multi-disciplinary resources often used in evaluation and also ERIH. A comparison was made between six journal lists: Ulrich's, ERIH, the Norwegian reference list, the Australian ERA Humanities and Creative Arts list, WoS and Scopus. The analysis uncovered a set of issues that would arise in any attempt to establish a comprehensive database of European SSH scholarship.

The size of the SSH literature cannot be estimated unless agreement is reached on the definition of "literature." Although all the lists examined here are seen as lists of journal literature, the stringency of their criteria for inclusion vary and seem to determine their size. In increasing order of stringency/decreasing size we have: Ulrich's, Norwegian list, Scopus, WoS. ERIH and ERA HCA cover fewer fields and so are not comparable. Given this variability, we compared lists using a single definition of scholarliness.

Restricting a journal list to scholarly, refereed material is a value held in high esteem by all parties to evaluation. However, our analysis demonstrated that the definition of scholarliness is contested with the distinction between international and national literatures pivotal. There is much more agreement for internationally oriented journals. Identifying the scholarly part of national literatures seems to be far more difficult. It is likely very difficult to devise and consistently apply criteria of scholarly quality across a range of languages. Given the importance of national language publishing in SSH, solving the problem of consistent, evidence-based criteria for journal scholarly quality that can be applied impartially and without favouritism across the range of European languages will be crucial to building a respected bibliometric infrastructure for SSH. A broadly consultative process will be required to devise an acceptable, transparent solution.

Our analysis of coverage illustrates the challenges that any bibliometric infrastructure in European social sciences and humanities will face in achieving coverage of national literatures. Both the Norwegian list and ERIH aim to overcome English language bias of the big databases, and they do list more non-English language journals. Yet, there are far more academic journals in European languages than both lists cover and their coverage of English language journals is much more comprehensive than their coverage of European language journals.

A brief overview of national evaluation systems suggests that the way forward is national research documentation systems in which universities submit bibliographic records of their publications and are responsible for data quality. Agencies then validate and standardize the data. Publications are differentiated according to a 2-4 level classification of the quality of the publication venue. Weighted publication counts or publication distributions across the levels are then produced. The first step in designing a research documentation system is a consultative design process to define fields, specify a journal list and define journal level categories. Each area involves difficult, subjective judgements and different processes come to different conclusions. Obtaining international agreement multiplies the difficulties. We also suggest an alternative, creating an electronic, full text infrastructure for European SSH literature.

## Introduction

In the social sciences, humanities or arts it is largely impossible to substantiate statements on research excellence with reliable indicators for international benchmarking of fields and institutions. To help overcome this limitation, this report will examine bibliometric systems in the social science and humanities from the perspective of assessing their potential for institutional research evaluation nationally or internationally. We will examine the criteria used to assemble journal lists in social science and humanities and then review existing evidence of the coverage of bibliometric databases. We will briefly report on institutional evaluation methods used in selected countries, placing the focus on state-of-the-art, metric oriented methods. We will suggest ways forward to build infrastructures that cover journal articles, monograph material, non textual output etc.

Any successful infrastructure will need to productively engage with the scholarly community. And although this has happened in Norway and Australia, engagement never comes easily because the very idea of metrics is often antithetical to the values held by many scholars most especially in the humanities and arts. Therefore it seems useful to make explicit the values that will be embodied in any bibliometric system. While the humanities and arts place high value on the individual human experience of a single piece of work, bibliometrics is an attempt to comment on community use of a body of scholarship. “Impact” is the term used to describe what is measured; no claim should be made to measure “quality” a property inherent in an individual piece of work separate from its reception by the scholarly community. In contrast to the world of elite expert judgement, bibliometrics captures the judgements of the broad community and so tends to democratic rather than aristocratic values. Nevertheless, bibliometric impact measures always identify a small cadre of outstanding performers who compare to the bulk of scholars with much lower impact. This is the nature of the distribution of scholarly impact, which is elitist and uneven across the community. Bibliometric impact does not require consensus as a broad dispute can also create bibliometric traces. But attention is required; to be ignored is to have low impact in bibliometric measurements. Bibliometrics does not represent a substitute for scholarly judgment, rather it represents a tool to use in situations where amassing scholarly judgments would take so much time that scholars would be completely consumed and diverted from scholarly work. This is primarily an issue of scale. While assessments of individuals and their oeuvre require peer judgement, national or European scale institutional level assessments relying solely on peer judgement would create a crushing workload. It is also an issue of bias, bibliometric data can be useful also in small countries where impartiality in peer judgement is difficult to achieve.

Those who employ bibliometrics place high value on scholars contributing to the public body of knowledge through publication – whether it be journal articles, monograph material, or the popular press.<sup>1</sup> Since the publishing world is vast and quality varies, bibliometrics is interested in applying quality filters to what is allowed to be counted, as well as assessing impact once published. To employ bibliometrics is to accept that not everybody contributes equally, judgements will be made; there will be winners and losers. And judgments that traditionally were reserved for the community of scholars will be made in part by outsiders.

Bibliometrics in the social science and humanities is challenging because the bibliometric infrastructure of comprehensive citation databases have largely indexed one type of literature – international journal articles. In social science and humanities there are four distinct literatures: international journals, national journals, books, and enlightenment publications (Hicks, 2004). International journal articles are mostly English language, and most comprehensively indexed in databases such as Web of Science and Scopus. These are the currency of evaluation around the

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<sup>1</sup> In addition, there is great interest in extending methods to public exhibition and performance.

world. This is not wrong; using journal articles to communicate research results to an international audience is important in scholarly work. However, there is more to scholarly work in social science and humanities than the indexed international literature. Often books are written and have a very high impact (Clemens et al. 1995; Webster, 1998). National literature, not in English and published outside the US, UK or Netherlands, represents knowledge developed in and for a local context. Enlightenment literature represents knowledge reaching out to application and is found in periodicals whose goal is knowledge transfer or “enlightenment” of non-specialists. For example, in the US the economist Paul Krugman exerts influence through his *New York Times* column. Burnhill and Tubby-Hille (1994) found that in the UK “projects in education [were] reaching practitioners through the *Times Education Supplement*, with researchers in sociology, social administration, and socio-legal studies publishing in such periodicals as *New Society* and *Nursing Times*.” Kyvik (2003) found that in Norway one-half of social scientists published contributions to public debate.

To add to the problems, each literature is more trans-disciplinary than comparable scientific literature. Social science and humanities bibliometric evaluation must make the best of the low citation rates associated with trans-disciplinary citation scatter and citation accumulation times which are too long for policy makers’ purposes (Hicks, 2004). The authors and topics associated with the four literatures overlap, but not completely, so the results of partial bibliometrics studies will not be the same as the results of an evaluation which included all four literatures.

The ESF is interested in enabling full evaluation in the social sciences and humanities (SSH). This requires including all four literatures: international journals, national journals, books, and enlightenment publications as well as non-textual output in the fine arts. This report contributes to this aim.

## Journal lists

The first issue to be addressed in assessing the feasibility of an adequate bibliometric system in SSH is how large is the SSH literature and how much of it should be counted in an evaluation? Ideally we need to know how big each of the four literatures is and how much of it is accessible using current evaluation tools in order to target resources for improvement. Working with limited time and resources, our efforts focused on assessing international and national journal literature in multi-disciplinary resources often used in evaluation and also ERIH. Our efforts were focused here because there is much less to say about the size of monograph and enlightenment literature since infrastructure in this area is embryonic or non-existent.

A comparison was made between six journal lists: Ulrich’s, ERIH, the Norwegian reference list, the Australian ERA Humanities and Creative Arts list (ERA HCA), WoS and Scopus. The first four are not databases of journal articles; rather they are lists of journals. WoS and Scopus are databases of articles that cover a specified list of journals, and we analyze their lists. All except ERIH and ERA HCA are comprehensive across scholarly fields. We only analyze the SSH journals in them. The analysis uncovered a set of issues that would arise in any attempt to establish a comprehensive database of European SSH scholarship.

Table 1 compares these lists and a few others on several key dimensions. First note that the lists are built using two different processes. Commercial products use an editorial process; government sponsored lists such as ERIH, the Norwegian and Australian lists use peer committee based processes. The answer to the question: “How big is the SSH journal literature?” proves elusive as the number of journals in the lists varies quite bit. Several of the lists classify journals into different types, recognizing that broadly distinguishing levels of scholarly quality is a necessity because the literature is vast and variable. The table further notes whether the list provides the basis for a bibliographic database or a full text database with or without citations/references. The final column notes who uses the list for evaluative purposes.

Table 1 – Journal lists

Journal list	Process to choose journals	Estimated size of SSH Journal list	Journal classification	Database of articles	Full text	Includes references/citations	Evaluative use of database
Ulrich's	editorial	17,900	refereed & academic				
ERIH	peer	5,200 (3,900 verified in Ulrich's)	3 levels				
Norwegian	peer	8,200 (6,100 unique verified in Ulrich's)	2 levels	For institutional submission			in house
ERA HCA Australian Humanities and Creative Arts list	peer	6,748 (5,538 verified in Ulrich's)	4 levels	For institutional submission		Scopus	in house
WoS	editorial	2,600	no, considered to be selective	✓		✓	diverse analysts
Scopus	editorial	4,900	No	✓		✓	diverse analysts
GS	unknown/convenience?	unknown	No	✓	✓	✓	attempted, accurate analysis extremely difficult
Proposed infrastructure	peer	1,000-5,000 depending on where WoS and Scopus enhancements stop	No	✓	✓	✓	analysts would use WoS or Scopus

## Criteria for inclusion on lists

Ulrich's is the authoritative source of bibliographic and publisher information on more than 300,000 periodicals of all types from around the world. It includes: academic and scholarly journals, open access publications, peer-reviewed titles, popular magazines, newspapers, newsletters, and more. Ulrich's has been used in bibliometric studies as the benchmark against which WoS and Scopus coverage is measured (Archambault et al., 2006; De Moya-Anegon et al., 2007). About its inclusion criteria, Ulrich's says the following:

*While aiming for maximum title coverage, Ulrich's has established certain criteria for inclusion. Ulrich's covers publications that meet the definition of a serial except administrative publications of governmental agencies below state level that can be easily found elsewhere. A limited selection of membership directories, comic books, and puzzle and game books is also included.<sup>2</sup>*

Listing the entire world's periodicals, irrespective of language or country of publication is truly ambitious. In large measure Ulrich's succeeds. Studies have found only very small numbers of journals that are not yet indexed in Ulrich's. We found 30-40 journals, all newer, that were not yet indexed. We told Ulrich's about these journals and they have been incorporated in the database. We bought 74k records covering active, regularly appearing periodicals in SSH fields.

The "Norwegian list" is the reference list of journals whose papers are acceptable submissions to the Norwegian evaluation system. The list covers all fields of science, social science and humanities. The list covers scholarly publications which are defined as: presenting new insights in a form that allows the research findings to be verified and/or used in new research activity in a language and with a distribution that makes the publication accessible for a relevant audience in a publication channel with peer review. Publications in local publication channels are not counted. The level of a publication channel is defined by its mix of authors; local and so excluded journals are those with more than 2/3 of their authors from the same institution (Sivertsen, 2008). G. Sivertson kindly shared with us the SSH list containing 8,165 journals. 6,103 could be matched to Ulrich's records, and we analyze those.

The European Reference Index for the Humanities, or ERIH, aimed initially to identify, and gain more visibility for top-quality European Humanities research published in academic journals in, potentially, all European languages. It is a fully peer-reviewed, Europe-wide process, in which 15 expert panels sift and aggregate input received from funding agencies, subject associations and specialist research centres across the continent.<sup>3</sup> ERIH includes good, peer-reviewed research journals in 15 broad disciplines of the Humanities.<sup>4</sup> The 15 fields are: Anthropology (Evolutionary); Anthropology (Social); Archaeology; Art, Architectural and Design History; Classical Studies; Gender Studies; History and Philosophy of Science; History; Linguistics; Literature; Music and Musicology; Pedagogical and Educational Research; Philosophy; Psychology; Religious Studies and Theology. After cleaning, we believe there are 5,197 journals in ERIH; 3,942 could be matched to Ulrich's records, and we analyze those.

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<sup>2</sup> [http://www.ulrichsweb.com/ulrichsweb/faqs.asp#About\\_Ulrichs](http://www.ulrichsweb.com/ulrichsweb/faqs.asp#About_Ulrichs)

<sup>3</sup> <http://www.esf.org/research-areas/humanities/research-infrastructures-including-erih.html>

<sup>4</sup> <http://www.esf.org/research-areas/humanities/research-infrastructures-including-erih/frequently-asked-questions.html>

The ERA HCA list was developed as part of a larger process:<sup>5</sup>

*The Australian ERA initiative will use a range of indicators and other proxies to support the evaluation of research excellence. One of these indicators is discipline-specific tiered outlet rankings. The Australian Research Council (ARC) has consulted with the sector to assist with the development of research journal rankings, a subset of tiered outlet rankings. In late 2007 the four Learned Academies and 27 disciplinary bodies undertook a journal ranking exercise to develop draft journal rankings for their relevant disciplines. The lists have been reviewed by the ARC, in consultation with the Academies and the other list providers, to remove duplication and inconsistencies. 19,500 unique peer reviewed journals have been identified to form a draft list of ranked journals. Each journal has a single quality rating and is assigned to one or more disciplines. . . The consultation to develop outlet journal rankings occurred in 2008. The ERA-Humanities and Creative Arts (HCA) journal list was reviewed by discipline-specific experts to strengthen sector confidence in the accuracy of the journal rankings. The ARC will consult about discipline-specific ranked conferences, publishers' lists and other outlets with the relevant disciplines at a later time.*

Thomson-Reuters Web of Science (WoS) incorporates the Science Citation Index (SCI), Social Science Citation Index (SSCI) and Arts and Humanities Citation Index (A&HCI). WoS is often criticized for Anglo-Saxon bias and limited coverage. However, it is also recognized in many evaluation systems that articles published in WoS indexed journals have reached an internationally recognized standard. Journal editors feel it an honour to meet the criteria for inclusion in WoS. For these reasons, WoS's editorial standards for journal inclusion are described in some detail here:<sup>6</sup>

*The evaluation process consists of evaluation of many criteria such as, Basic Journal Publishing Standards (including Timeliness of publication, adherence to International Editorial Conventions, English Language Bibliographic Information (including English article titles, keywords, author abstracts, and cited references in the roman alphabet). Thomson Reuters also examines the journal's Editorial Content, the International Diversity of its authors and editors. Citation Analysis using Thomson Reuters data is applied to determine the journal's citation history and/or the citation history of its authors and editors.*

**Basic Journal Standards: Timeliness of publication** is a basic criterion in the evaluation process. It is of primary importance. A journal must be publishing according to its stated frequency to be considered for initial inclusion in the Thomson Scientific database. The ability to publish on time implies a healthy backlog of manuscripts essential for ongoing viability. It is not acceptable for a journal to appear chronically late, weeks or months after its cover date. . . . Thomson Scientific also notes whether or not the journal follows **international editorial conventions**, . . . informative journal titles, fully descriptive article titles and abstracts, complete bibliographic information for all cited references, and full address information for every author. . . Application of the peer review process is another indication of journal standards and indicates overall quality of the research presented and the completeness of cited references.

**Editorial Content:** . . . Thomson Scientific editors determine if the content of a journal under evaluation will enrich the database or if the topic is already adequately addressed in existing coverage.

**International Diversity:** Thomson Scientific editors look for **International Diversity** among the contributing authors and the journal's editors and Editorial Advisory Board members. . . . All regional journals selected must be publishing on time, have English-language bibliographic information (title, abstract, keywords), and be peer reviewed. Cited references must be in the Roman alphabet.

Scopus is an Elsevier product and its inclusion policy is:<sup>7</sup>

*Scopus aims to be the most complete and comprehensive resource for all research literature in Science, Technology and Medicine and Social Science. Additional titles are selected annually for inclusion in Scopus by the external, independent CSAB based on its collective professional expertise and background. Criteria for inclusion in Scopus include, but are not limited to, the following:*

- 1. A title must have an English-language title and publish English-language abstracts of all research articles. However, full-text articles can be in any language.*
- 2. Timely publication of issues, with a minimum of one issue per year, is required.*

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<sup>5</sup> [http://www.arc.gov.au/era/era\\_journal\\_list.htm](http://www.arc.gov.au/era/era_journal_list.htm)

<sup>6</sup> Modified from: <http://science.thomsonreuters.com/mjl/selection/#jsc> and [http://thomsonreuters.com/business\\_units/scientific/free/essays/journalselection/](http://thomsonreuters.com/business_units/scientific/free/essays/journalselection/)

<sup>7</sup> [http://info.scopus.com/docs/content\\_coverage.pdf](http://info.scopus.com/docs/content_coverage.pdf)

3. Overall quality must be high.
- 3.1 *Assessment of a journal's quality may include, but is not limited to, the following: Authority: including the reputation of a commercial or society publisher, the diversity in affiliations of authors or – if there is an editorial board – the international recognition of the leading editors. Popularity & Availability: including the number of references the title has received in Scopus; the number of institutions that have subscribed to the title; and the number of times the title has been requested for inclusion.*
- 3.2 *A title must demonstrate some form of quality control (e.g. peer review).*

Google Scholar is a Google product. Google Scholar states that it includes: peer-reviewed papers, theses, books and abstracts and articles from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations. Meho & Yang (2007) find not just the above, but also: working papers & conference papers posted on internet by authors (that is vanity publishing), bachelor's theses, presentations, grant and research proposals, doctoral qualifying examinations, submitted manuscripts, syllabi, term papers, web documents, preprints, and student portfolios. Because Google Scholar coverage is never explicitly stated, we exclude Google Scholar from this comparison of journal lists.

Google Scholar is pre-eminent in providing findability. Full text indexing makes a dramatic difference to scholars searching for obscure material. For example, White (2006) searched for material on Gabriel Plattes – a 17th century utopian and scientific author. In Google Scholar and JSTOR (also full text) he found 50-60 articles. In WoS, which is bibliographic rather than full text, he found less than 5. Google Scholar succeeds in making information far more accessible than any other resource. But to be a basis for transparent and reproducible evaluation, the universe of included material must be specified, and Google Scholar therefore does not qualify as an evaluation infrastructure.

The size of the SSH literature cannot be estimated unless agreement is reached on the definition of "literature". Although all the lists examined here are seen as lists of journal literature, the stringency of their criteria for inclusion vary and it is their relative laxness that seems to determine their size. In increasing order of stringency/decreasing size we have: Ulrich's, Norwegian list, Scopus, WoS. Google Scholar cannot be included as its size is unknown, through criteria seem the most lax. ERIH and ERA HCA cover fewer fields and so are not comparable. Given this variability, we need to try to compare lists using a single definition of scholarliness. We do this below by taking Ulrich's as the comprehensive list and comparing the others with it. However, we must first point out some problems with the lists themselves.

### **A note on problems in the journal lists**

Our work preparing the lists for analysis revealed that there would be problems constructing a database from journal lists established through peer consultation. These issues fall into the categories of: errors, journal status and inclusion of scientific journals.

Although all lists and databases in this area are found to contain errors upon close examination, the peer lists suffer from a rather high rate of error. The ERIH list we obtained in January 2009 had not been cleaned or checked for errors. It contained duplicate records with slight differences in title or typos in ISSN in different fields, as well as erroneous ISSN numbers and titles. It contained material not identified with an ISSN (and every scholarly journal has an ISSN). Both ERIH and the Norwegian list contained old ISSNs. Journal publishing is dynamic and journals merge and change names and evolve. Tracking this accurately requires resources. We recommend that a librarian be employed to clean and correct the raw ERIH lists. The librarian could also flag non-scholarly material (see below). We recommend that an evaluation infrastructure only include

current, scholarly journals. Over time, the database would evolve with journals and managing these changes would be one complexity in building any infrastructure.

ERIH and the Norwegian list contain journals that have ceased publication, are suspended, are published irregularly, and journals whose status is unknown. WoS and Scopus exclude such journals. This issue has not been noted in previous studies of WoS and Scopus coverage. Therefore, it is likely that all existing studies of WoS and Scopus coverage are unfair to the databases in that they did not narrow down the field of publications to the material the databases claim to cover. We would argue that an evaluation infrastructure should aim, like the databases, to cover active, regularly appearing journals. This is because the world of publishing is vast and many vehicles of dubious status come and go. It is not unfair to ask SSH researchers to focus on, and support, outlets with quality standards and some ongoing existence. There is in addition the problem that it is impossible to guarantee consistent coverage of a set of transient material unless resources would be infinite.

ERIH contains a number of scientific journals, particularly in psychology. This is a choice ERIH may wish to make. However, if an investment were to be made in an infrastructure for evaluation of SSH work, it would be a waste of money to work with these journals, as they are already well covered in WoS and Scopus. In addition, we did not obtain science journals from Ulrich's because assessing ERIH's coverage of science fields would not be meaningful.

Google Scholar presents problems of a different type; it is not in a form usable for structured analysis. Basically this is because Google Scholar is not built from structured records, that is from metadata fields. Rather than using the author, affiliation, reference etc. data provided by publishers, Google Scholar parses full text to obtain its best guess for these items. This is an imperfect process. Therefore, at one point the most published author in Google Scholar was "I. Introduction." An author search in Google Scholar would not find any paper under the author's name if it had instead been tagged with Prof. Introduction as the author. Meho and Yang (2007) undertook a bibliometric study using WoS, Scopus and Google Scholar and counted the hours needed to collect, clean and standardize the data. WoS was the easiest to use at 100 hours, Scopus required 200 hours and Google Scholar 3,000 hours for the same job. They also determined the citations missed by each database due to database error. WoS missed 0.2%, Scopus 2.4% and Google Scholar 12%. WoS & Scopus failures were traced to incomplete cataloguing of reference lists. Google Scholar failures were traced to inability to match searched words and ignoring reference lists in documents if the keywords: "Bibliography" or "References" were absent.

## **Scholarliness analysis**

Given the variability in accession criteria between the lists, it is useful to apply a single criterion to all lists to assess the overall scholarliness of their content. Both ERIH and the Norwegian list claim to be restricted to scholarly material. This claim is particularly strong for ERIH which claims to cover "good, peer reviewed research journals." Both the ERIH and Norwegian list contain material assessed as non-scholarly by Ulrich's, for example consumer/magazines or trade journals. For example, the ERIH category history includes coin collecting magazines. We would argue that the stated intent of ERIH to cover quality, peer reviewed journals is correct; publishing in non-scholarly journals is important for reaching the general public, but should be dealt with separately as enlightenment rather than scholarly literature. If the first priority is advancing evaluation of scholarly publishing; enlightenment literature should be clearly differentiated.

We analyzed the overall scholarliness of the lists by calculating the share of non-academic material in them. Table 2 reports the share of non-scholarly material in each list judged in two ways. The first uses Ulrich's identification of a journal as refereed (which may be incomplete particularly for non-English language journals):

*In Ulrich's, the term refereed is applied to a journal that has been peer-reviewed. Refereed serials include articles that have been reviewed by experts and respected researchers in specific fields of study including the sciences, technology, the social sciences, and arts and humanities. The Ulrich's editorial team assigns the "refereed" status to a journal that is designated by its publisher as a refereed or peer-reviewed journal. Often, this designation comes to us in electronic data feeds from publishers. In other cases Ulrich's editors phone publishers directly for this information, or research the journal's information posted on the publisher's website.<sup>8</sup>*

The second is Ulrich's classification of a journal as academic/scholarly (which may be too broad). We can see that WoS has the most credible claim to being a purely scholarly database. Next are the Norwegian list and Scopus and finally ERIH and ERA HCA. The table also includes a breakdown by language of the journal. Combining the two methods of assessing scholarliness with the two categories of language gives a complex picture which we can simplify as follows. WoS contains the lowest share of material likely to be non-academic. The other lists will lead in some categories but be similar to their counterparts in others. ERIH is notable for the highest percentage of non-refereed material in European languages.

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<sup>8</sup> [http://www.ulrichsweb.com/ulrichsweb/faqs.asp#About\\_Ulrichs](http://www.ulrichsweb.com/ulrichsweb/faqs.asp#About_Ulrichs)

Table 2 - Share of Non-academic Journals

<b>List (est. SSH size)</b>	<b>Non-Refereed</b>	<b>Non-Academic/Scholarly</b>
<b>ERIH (3,900)</b>	<b>43%</b>	<b>10%</b>
English	24%	5%
Non-English	79%	20%
European	79%	20%
Other	73%	12%
<b>ERA HCA<sup>9</sup> (3,817)</b>	<b>40%</b>	<b>9%</b>
English	26%	6%
Non-English	70%	16%
European	70%	16%
Other	65%	13%
<b>Scopus (5,800)</b>	<b>32%</b>	<b>12%</b>
English	26%	11%
Non-English	67%	22%
European	65%	23%
Other	74%	17%
<b>Norwegian (6,100)</b>	<b>30%</b>	<b>6%</b>
English	23%	5%
Non-English	66%	11%
European	67%	11%
Other	45%	15%
<b>WoS (2,900)</b>	<b>16%</b>	<b>4%</b>
English	11%	3%
Non-English	58%	10%
European	60%	10%
Other	20%	0 %

This analysis is interesting because all the lists claim to include only scholarly, refereed material. This is a value held in high esteem by all parties to evaluation. However, the definition of scholarliness is clearly contested with the distinction between international and national literatures pivotal. Taking English language as defining international literature (which is handy but not entirely true), there is much more agreement between the lists and Ulrich's definitions of scholarly for internationally oriented journals. Identifying the scholarly part of national literatures seems to be far more difficult because the share of non-scholarly material is much higher in the non-English portion of the lists. It is unclear whether the peer or editorial processes are misguided in this, but most likely is that it is very difficult to devise and consistently apply criteria of scholarly quality across a range of languages. Indeed, WoS has only recently taken on this challenge with its campaign to extend coverage to "regional" journals. Given the importance of national language publishing in SSH, solving the problem of consistent, evidence based criteria for journal scholarly quality that can be applied impartially and without favouritism across the range of European languages will be crucial to

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<sup>9</sup> Excludes law for comparability with ERIH

building a respected bibliometric infrastructure for SSH. A broadly consultative process will be required to devise an acceptable, transparent solution.

## Coverage Analysis

In tension with the value of scholarliness is the value of inclusiveness. An infrastructure adequate to representing European social science and humanities research would ideally incorporate all active, scholarly European social science and humanities journals accurately identified. How close are we to that goal? To analyze list coverage we did the following:

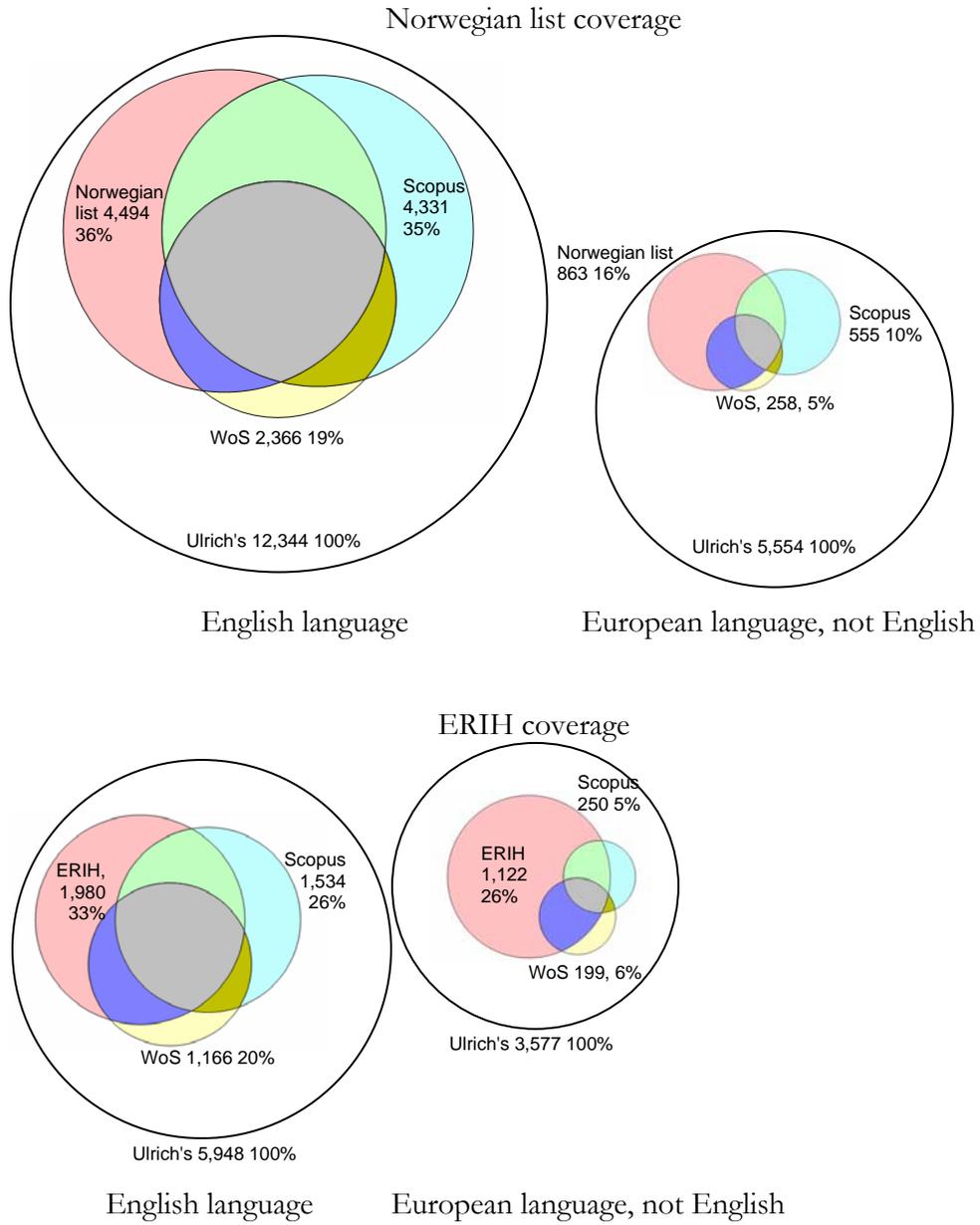
1. The count is at the level of journals not articles. Therefore, a journal that publishes few papers and a journal publishing many papers count equally. A different picture would be found at the article level, which would give more weight to larger journals. (See Norris & Oppenheim, 2007 for detailed analysis of this issue.)
2. The journals counted are active and regularly appearing. Irregular or defunct journals are not included.
3. The journals counted are those published in a European country or in the United States.
4. All social sciences and humanities fields were included in the Norwegian list analysis. This includes law and management. Only journals whose “major subject” as assigned by Ulrich’s was one of the 15 ERIH fields were counted in the ERIH analysis.
5. The definition of scholarly used here was somewhat more sophisticated than that used above. All periodicals classified as “academic/scholarly” by Ulrich’s were included except newspapers, newsletters, bulletins and magazines – which were only included if they were also on one of the other lists. In addition, any periodical on any of the other lists was included if Ulrich’s had not classified the periodical’s type or if Ulrich’s had classified the periodical as “trade” (as some journals, for example *Energy Economics*, were found to be classified as trade rather than scholarly journals).

The results of the analysis are shown in a series of Venn diagrams in Figure 1. First note that the circles are larger in the Norwegian list comparison because more fields are included. Not surprisingly, we see that the lists of journals, Ulrich’s, ERIH and the Norwegian list are larger than the databases of articles – Scopus and WoS. The lists and databases overlap a great deal, but each contains journals not indexed by anybody else except Ulrich’s. WoS is most completely incorporated in the other lists, perhaps because it is the de facto standard that others are working to improve. 33-36% is the highest coverage obtained, for English language journals by ERIH, Norwegian list and Scopus. Coverage of non-English language journals is lower in every list with the Norwegian list achieving 16% and ERIH 26%. Also, there is less consensus about which non-English journals should be covered, indicated by less overlap between the lists. Journals published by large publishers, that appear to be scholarly but are not included in any list except Ulrich’s include: *Buddhist Studies Review* (Equinox Publishing), *Journal of Religion in Europe* (Brill), *International Journal of Contemporary Iraqi Studies* (Intellect), *Sikh Formations* (Routledge), *Wege zum Menschen* (Vandenhoeck und Ruprecht), *Per la Filosofia* (Fabrizio\Serra Editore) and so on.

These results anticipate the challenges that any bibliometric infrastructure in European social sciences and humanities will face in achieving coverage that can be defended as comprehensive enough, especially in non-English language literature. Both the Norwegian list and ERIH aim to

overcome English language bias of the big databases, and they do list more non-English language journals. Yet, there are far more academic journals in European languages than both lists cover and their coverage of English language journals is much better than their coverage of European language journals.

Figure 1 – Analysis of European social science and humanities journal coverage



Venn diagrams plotted using: Littlefield & Monroe, Venn Diagram Plotter, US Department of Energy, PNNL, Richland, WA, 2004-2007.

A caveat must be added to this discussion. The situation is dynamic. Coverage has become a point of competition between WoS and Scopus, and they have responded in particular to ERIH. Both WoS and Scopus are adding several thousand journals to their lists. This analysis does not include these recent additions. In addition, the ERIH list is under revision, and the version used here will soon be out of date.

## **National evaluation systems**

We undertook a scoping exercise to gain an initial understanding of how broadly national level research evaluation is being conducted. We drew on previous reviews of national evaluation systems in the HERA report and Geuna and Martin (Dolan, 2007; Guena & Martin, 2003). We also searched Google using the country name and “research evaluation”, “university evaluation” or “higher education evaluation.” These searches identified academic papers, reports and web pages from which we collected information. Also the searches identified organizations conducting evaluations, and we visited their websites as well as the website of the Ministry of Education in each country. The searches were conducted in English, except for China. For most of the countries not reviewed in the HERA report or GEUNA and MARTIN paper, the evaluation systems identified seem to be focused on education accreditation and evaluation, rather than research evaluation.

Table 3 identifies the countries in which we found evaluations systems, whether the system is undergoing redesign, which agency conducts the evaluation, the type of unit evaluated and the databases used. We believe that there are some common elements in these evaluations. All of them seem to use lists of publications, and it doesn't seem that any of them except Australia use different metrics in SSH fields, though in systems based on peer evaluation such as the South African and the UK RAE, peer rating groups apply field-specific criteria. The Australian system allows for different metrics in different fields. Several systems such as Australia, UK, US and South Africa are more or less voluntary in that units are able to decide whether or not to be evaluated. It would seem that systems differ on whether funding depends on the results of the evaluation with about half of the countries allocating some funding based on the results. Table 4 provides short summaries of the evaluation systems.

Table 3 – Country evaluation exercises identified

Country	Evaluator	Level	Databases used
Australia*	ARC	disciplines within institutions	data submitted & Scopus
China	CDGDC	Discipline <sup>10</sup>	WoS, EI, MEDLINE, CSCD, CSSCI
Denmark*	EVA	University	
Finland	MOE	University	KOTA
Finland	FINHEEC	University	
Finland	KAK	program /project group	
Flanders*	SOO	University	WoS
France	AERES	University + Program	
Germany	DFG	University	CEST
Hong Kong	UGC	Cost centre	
Hungary	HAS	Institutions within HAS	
Hungary	HAC	University	
Japan	NIAD-UE	University	
Mexico		Individual	
Netherlands	VSNU	Department	
New Zealand	TEC	Individual with aggregation to university	
Norway	Government	Universities, fields	Data submitted, WoS & Bibsys, Norart used to verify
Poland	CSR	University	
Slovenia	ARRS	University + Department	WoS +
Slovenia	MOE	University + Department	SCI
South Africa	NRF	Individual with aggregation to university	
Spain	ANECA		
Sweden	NAHE	Subject areas and study program	
UK*	RAE	Department	data submitted
US	NRC	Department	WoS

\* Countries known to be redesigning their evaluation systems

<sup>10</sup> The evaluation unit in China is discipline, which does not correspond to department, because one department might have several different disciplines, and one discipline in one university may be located in several departments.

Table 4 – Summaries of country evaluation mechanisms

Country	Short summary
<b>Australia*</b>	Australian Research Council (ARC), Excellence in Research for Australia (ERA) Initiative. Three categories of indicators are seen as appropriate for each discipline. Research publications and bibliometrics in focus for 'research quality', including publications and citations. Publications include book, book chapters, journal articles, and refereed conference publication, and journals and conferences are ranked. Publication reference period is a six years period ending on 31 Dec two year prior to the evaluation year. Institutions invited to submit data for evaluation. (Consultation Paper for ERA)
<b>China</b>	China Academic Degrees & Graduate Education Development Center (CDGDC). Data collected from government agencies and universities submission. Quantitative indicators and peer review. Publications data from SCI, SSCI, AHCI, EI, MEDLINE, and Chinese database CSCD (Chinese Sciences Citation Database) and CSSCI (Chinese Social Science Citation Information). (CDGDC website)
<b>Denmark*</b>	<p>Since 1995, funding has depended upon the volume of teaching and external research income. No other performance measures are used. (GEUNA and MARTIN)</p> <p>The Danish Evaluation Institute is an independent institution established in the summer of 1999. The Danish Centre for Quality Assurance and Evaluation of Higher Education (Evalueringssenteret) was established in 1992. "Meta Evaluation" was conducted which is mandated and not connected with funding allocation. First, questionnaire based surveys among heads of departments and heads of faculties. Second, in-depth interviews with vice-chancellors. Finally, case studies among six educational fields covering different types of faculties (there was an evaluation from 1993 to 1997). The evaluation of the Centre was later redefined to concentrate on the lessons learned and to discuss methodological considerations for the future. The Centre was integrated into the Danish Evaluation Institute. The Danish are now implementing the Norwegian system.</p> <p>Sources: online paper "Meta Evaluation of the Evaluations of Higher Education in Denmark", and website of EVA</p>
<b>Finland</b>	<p>Universities negotiate their block grant with the Ministry of Education and a small proportion of this (3%) is performance related. Measurement uses data from the national database (KOTA), updated by universities. Data includes publication information. (HERA)</p> <p>Finland Higher Education Evaluation Council (FINHEEC) formative institutional evaluation: peer review of a university self-evaluation. (HERA)</p> <p>Academy of Finland (AKA), self-evaluation by questionnaire, peer review of the questionnaires and site visits. (HERA)</p>
<b>Flanders*</b>	Steunpunt O&O Statistieken (SOO), bibliometric analysis. Due to limitations of SSCI and AHCI, bibliometrics are not used for the allocation of funds to these agencies. (HERA)
<b>France</b>	French National Agency for the Evaluation of Research and Higher Education (AERES) has evaluation similar to its counterparts in other countries. Source: Pierre Batteau. Aspects of evaluation and accreditation in higher education in France.
<b>Germany</b>	German Research Foundation (DFG) "Funding Ranking": data from outside of universities, from multiple organizations, bibliometric data: publications in international journals gleaned from the Centre for Scientific and Technology Studies (CEST) in Switzerland. (HERA)
<b>Hungary</b>	<p>Hungarian Academy of Sciences conducted a comprehensive review of its institutes, using peer review and quantitative indicators. The idea was to support a more selective distribution. This led to a number of recommendations concerning the Academy's network, its management of resources, and the need for organizational change. Source: GEUNA and MARTIN</p> <p>Hungarian Accreditation Committee also has higher education evaluation similar with Japan, and Denmark. Source: HAC website</p>
<b>Japan</b>	3 evaluation systems in Japan: <b>Self-Assessment</b> , mandatory; <b>Certified Evaluation and Accreditation</b> , several agencies are certified to conduct evaluation. The first one is the Japan University Accreditation Association (JUAA). <b>National University Corporation Evaluation</b> : performance-based evaluation of national university corporations and inter-university research institute corporations as to their performances against their annual plans and the attainment of each mid-term goal. Evaluation is based on analysis of documents and site visits. These evaluations seem to be more like getting a certification of quality rather than ranking the universities. It is unclear whether bibliometrics are used.

	Source : NIAD-UE website
<b>Netherlands</b>	Association of Netherlands Universities (VSNU) “Quality Assessment of Research”, peer review similar with RAE, but 4 dimensions: Scientific quality; Scientific productivity; Scientific relevance; Long-term viability. Bibliometrics will be extended to AH/SS disciplines. (HERA)
<b>Poland</b>	Committee for Scientific Research (CSR) schemes for funding allocation. (GEUNA and MARTIN) Quantitative: sum of the points received for performance R(P) and for so-called general results R(G) divided by the number of staff, giving an indicator of effectiveness (E). R(P) consists 6 indicators, including # of publications in refereed journals; and publication of books (monographs). R(G) includes numbers of citations. (HERA)
<b>Slovenia</b>	Slovenian Research Agency (ARRS), qualitative methods and quantitative indicators, including publication in ISI journals, other DB journals, national journals, and books. (HERA)
	The Accreditation Committee was funded to evaluate academy institutions and departments, publications during the previous five years, classified by type, with ten representative publications; citation in SCI during previous 5 years, and other indicators are used. (GEUNA and MARTIN)
<b>South Africa</b>	National Research Foundation (NRF) evaluation system. Researchers apply for evaluation and choose one from among 22 panels (fields) to be evaluated in. Researchers are ranked into 6 categories, and researcher evaluation results by universities (research institutions, and other organizations) are also reported each year. Each panel has its own criterion for what are eligible as “research outputs” and weight for different types of outputs. Typically, they included peer review journal articles, books, conference invitations, textbooks, and so on, citation rate is also cautiously used.
<b>Spain</b>	The National Agency for Quality Assessment and Accreditation of Higher Education of Spain (ANECA) has an education evaluation, accreditation, and certification systems. (ANECA website, and online paper: “The Spanish University System”)
<b>Sweden</b>	The evaluation is of “quality assurance” nature, focuses on education quality, rather than research performance (e.g. publication). It also includes identifying and nominating centers of excellence, similar to Finland’s KAK evaluation. Sources: Högskoleverket (Swedish National Agency for Higher Education) website, and the “Swedish Universities & University Colleges Short Version of Annual Report 2008”
<b>UK*</b>	Panel review, information submitted by universities. (HERA)
<b>US</b>	University departments fill out questionnaire for National Research Council. Departmental bibliographies obtained from WoS. Opinion survey of departmental quality conducted. Final rankings based on formula devised from questionnaire and bibliometric results correlated with opinion survey.

## Recommendations

### National Research Documentation Systems

The way forward for national or international level metrics-based evaluation of current research output in the social sciences and humanities is hinted at in two current metrics-based systems, the Norwegian and Australian. Both rely on national research documentation systems. In national research documentation systems universities submit bibliographic records of their publications and are responsible for data quality. Agencies then validate and standardize the data. Publications are differentiated according to a 2-4 level classification of the quality of the publication venue. Weighted publication counts or publication distributions across the levels are then produced. Such systems were seen as a promising way forward in the recent HERA report (Dolan, 2007).

The first step in designing a research documentation system is a consultative design process in which the following are specified:

1. Fields
2. Journal list
3. Journal level definition

Each involves difficult, subjective judgements and different processes come to different conclusions. Issues associated with the journal list have been discussed extensively above. Fields

and journal level definitions will not be discussed, but Appendices 1 and 2 compare different solutions. Obtaining international agreement multiplies the difficulties. The strong reactions against ERIH, a first draft journal list produced in an international consultative process, illustrate the difficult road facing those attempting international agreement on all three points.

The Australian system is undergoing experiment and test. The Norwegian system is fully developed and so it will be described here. In Norway, the agency validates and standardizes bibliographic records submitted by universities. This involves creating and updating an authority file of allowed publication channels – referred to as the Norwegian list above. To be included a journal must operate at minimum on a national scale, that is fewer than 2/3 of authors can be from a single institution. Currently, there are 18,000 publication outlets accepted. Data from Thomson Reuters and the Norwegian national library are imported to verify and standardize records. The authority file standardizes names of publication channels, document types, and institutional affiliations of authors. The work by the agency recognizes and addresses known accuracy problem in submitted data. Problems of accuracy have been noted in audits of Australian bibliographic data submitted by universities (Butler & Visser, 2006) and in an extensive study of Flemish publications in law (Moed et al., 2002).

Counting in the Norwegian model is simple and transparent. All journals are assigned by peers to level 1 or 2. 20% are allowed in the top level. Points are assigned to different publication types (books and articles) in each level. The point system is fair to all fields because scholars in each field decide what to assign to level 1&2. Classifying journals into two levels recognizes and addresses a known incentive problem. The Australian composite index simply counted papers indexed in the Web of Science. Butler found that as a result Australian publication in low quality journals increased, and Australia's citation record declined (Butler, 2003). The Norwegian model was designed in response to Butler's finding (Sivertsen, private communication).

A national research documentation system like the Norwegian model is fair to all fields in which the written word predominates because SSH journal lists are developed by subject area experts. There are of course possible problems with the model. In Norway, papers are fractionally assigned to collaborating institutions. The alternative would be to give each institution full credit for collaborative papers. The incentives for collaboration differ between the two methods and should be considered when deciding between them. The system is somewhat costly. Full cost includes that born by universities in submission and by the agency in validation. The model contains no impact measures – i.e. citations, this means simplicity, but also can be seen as a limitation.

For this reason the Australian model extends the system. Australia will buy data from Scopus, and for papers published in journals indexed in Scopus, citation counts will be produced. This will serve as an additional dimension in the evaluation in addition to the distribution of papers across journal level. Citation counts will not be used for humanities fields as they are seen as inappropriate.

The full flexibility of the national research documentation system becomes apparent when examined in light of the four literatures. The international journal literature in all fields is of course included. The system easily incorporates national journal literature as well. However, national journals are likely to receive low weight in the peer classification of journals into levels, replicating results of citation analysis in WoS or Scopus. We would suggest that the only way to avoid this would be to create a separate component within the system for national literature for fields in which it is important. The national journal list would have different level criteria and would be counted separately from the international literature. There is some justification for this as the evidence

suggests that the concerns of the national literatures differ from those of the international literature and thus they form two separate, though interacting systems (Hicks, 2004). Books and monographs can be incorporated in a dedicated component if an acceptable list of scholarly publishers is identified and assigned levels. The Norwegian model does this. Similarly, enlightenment periodicals could be identified and assigned levels, perhaps based on readership. This would enable some assessment of societal impact of SSH scholarship. By the same logic, curated events can be listed and assigned levels and so a component added for non-text output.

### **Other possible approaches**

There are several other promising avenues that could be explored. But first there are several approaches we would not recommend. We do not recommend working with institutional open access repositories. The quality and coverage problems with such resources make them unsuitable for use in evaluation. We also do not recommend investing in coverage of conference proceedings because in SSH fields, less than 5% of references in journal articles go to conference proceedings. It is also very difficult to identify pure conference proceedings, almost 10% may be serials. (Lisee et al. 2008). It has been found to be very difficult and time consuming to confirm the refereed status of conferences, one study found only 18% of conference papers were cited and the most cited gained 12 citations (Butler & Visser, 2006). Conferences must be included when assessing computer science and engineering.

In addition to the national (or perhaps European) research documentation system suggested above, there are several other approaches that could be considered. First would be constructing a database of published scholarly books with records that included book author affiliation. This may now be possible due to the increasing use of an international standard for representing and communicating book industry product information in electronic form entitled ONIX. The ONIX standard contains fields for book author affiliation. If scholarly publishers could be persuaded to submit their records to a central authority with basic bibliographic information plus author affiliation, a book database usable for bibliometric analysis could be developed. Such a database would not contain the references in books and so would not enable citation analysis. Metadata from the initiative of European university presses in open access monograph publication could be incorporated in such a book database.

A second initiative would be to enhance the visibility and scholarly utility of SSH journals published by small European publishers. This could be done by building and maintaining an electronic full text SSH journal infrastructure for European SSH. This infrastructure would restrict itself to journals not already on-line and not indexed in WoS or Scopus. Such an infrastructure would support small European SSH scholarly journal publishers to enable their journals to be put online in a central infrastructure. This infrastructure would build metadata fields (author, institution, journal name etc.) as well as provide electronic full text of all articles to be read one page at a time with no saving or printing allowed. To preserve a revenue stream for journal publishers, articles would be sold cheaply for saving and downloading with revenue returned to publishers. The US National Research Council uses this model with its reports. As in a national research documentation system, a peer review process of journal selection would be needed to establish the list, and the list would need continual updating. The advantages of this plan are that public money would be spent to support small European publishers. For scholars, the plan would aim to overcome the obstacles to accessibility posed by a fragmented publishing industry. European SSH scholarship would become widely available worldwide. In addition, because any full text electronic resource will be indexed by Google scholar, automatic page translation and easy findability would become a reality.

WoS and Scopus would likely index the journals because the infrastructure would include article metadata. However, before any steps in this direction are taken, a careful needs assessment is required. Recent aggressive expansion by WoS and Scopus, not tracked here, suggests that database competition is strong enough that simply publishing a definitive journal list devised in a consensus peer process conducted internationally may be enough to get all sound journals covered by the citation databases.

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## Appendix 1 – Description of journal level classifications

	ERIH <sup>11</sup>	Australia	Norway <sup>12</sup>
Top 20-25%	<p><b>Category A (expected: 10%-25% of all titles):</b></p> <ul style="list-style-type: none"> <li>• High-ranking, international level publication</li> <li>• Very strong reputation among researchers of the field</li> <li>• Regularly cited all over the world</li> </ul>	<p><b>A* (top 5%):</b> Typically an A* journal would be one of the best in its field or subfield in which to publish and would typically cover the entire field/subfield. Virtually all papers they publish will be of a very high quality. These are journals where most of the work is important (it will really shape the field) and where researchers boast about getting accepted. Acceptance rates would typically be low and the editorial board would be dominated by field leaders, including many from top institutions.</p> <p><b>A (next 15%):</b> The majority of papers in a Tier A journal will be of very high quality. Publishing in an A journal would enhance the author's standing, showing they have real engagement with the global research community and that they have something to say about problems of some significance. Typical signs of an A journal are lowish acceptance rates and an editorial board which includes a reasonable fraction of well known researchers from top institutions.</p>	<p><b>Level 2 (20%)</b> publication channels nominated by the national councils in each field of research.</p>
Rest	<p><b>Category B:</b></p> <ul style="list-style-type: none"> <li>• Standard, international level publication</li> <li>• Good reputation among researchers of the field in different countries</li> </ul> <p><b>Category C:</b></p> <ul style="list-style-type: none"> <li>• Important local / regional level publication</li> <li>• Mainly local / regional readership, but occasionally cited outside the publishing country</li> <li>• Only European publications to be considered (ESF Member Organisations)</li> </ul>	<p><b>B (next 30%):</b> Tier B covers journals with a solid, though not outstanding, reputation. Generally, in a Tier B journal, one would expect only a few papers of very high quality. They are often important outlets for the work of PhD students and early career researchers. Typical examples would be regional journals with high acceptance rates, and editorial boards that have few leading researchers from top international institutions.</p> <p><b>C (next 50%):</b> Tier C includes quality, peer reviewed, journals that do not meet the criteria of the higher tiers.</p>	<p><b>Level 1 (80%)</b> the rest</p>

<sup>11</sup>[http://www.esf.org/index.php?eID=tx\\_nawsecuredl&u=0&file=fileadmin/be\\_user/research\\_areas/HUM/Documents/ERIH/ERIH-11-2007.pdf&t=1238560232&hash=f2e3b13c7fa6396828eb875977478d91](http://www.esf.org/index.php?eID=tx_nawsecuredl&u=0&file=fileadmin/be_user/research_areas/HUM/Documents/ERIH/ERIH-11-2007.pdf&t=1238560232&hash=f2e3b13c7fa6396828eb875977478d91)

<sup>12</sup> [http://www.arc.gov.au/era/tiers\\_ranking.htm](http://www.arc.gov.au/era/tiers_ranking.htm)

## Appendix 2 – Comparison of field classifications

ERA HCA	ERIH	Norwegian list	Ulrich's
	Anthropology (Evolutionary) Anthropology (Social)	Anthropology	Anthropology
Archaeology Curatorial and Related Studies History and Archaeology	Archaeology	Archaeology and Conservation	Archaeology Museums and art galleries
Architecture Art Theory and Criticism Design Practice and Management	Art, Architectural and Design History	Architecture and Design Art History	Architecture Art
	Classical Studies	Classical Studies	Classical studies
Literary Studies	Literature	Comparative Literature	Literature
Cultural Studies Language Studies Language, Communication and Culture Other Language, Communication and Culture		Romance Literature and Languages Asian and African Studies English Studies German and Dutch Studies Scandinavian Studies Slavic Studies	Asian studies Native American studies Ethnic interests
	Pedagogical and Educational Res. Gender Studies	Education Gender Studies	Education Men's studies Women's studies
Historical Studies	History	History	History
History and Philosophy of Specific Fields	History and Philosophy of Science		
Law		Law	Law
Linguistics	Linguistics	Linguistics	Linguistics
Communication and Media Studies		Media and Communication	Communications
Multidisciplinary - Social Sciences/Humanities		Multidisciplinary Humanities Multidisciplinary Social Sciences	Humanities: comprehensive works Social sciences: comprehensive works
Philosophy	Philosophy	Philosophy	Philosophy
	Psychology	Psychology	Psychology
Performing Arts and Creative Writing Studies in Creative Arts and Writing		Theatre Studies Dance	Theater

	Music and Musicology	Musicology	Music
Religion and Religious Studies	Religious Studies and Theology	Theology and Religion	Religions and theology
<b>Other fields included</b>			
<b>ERA HCA</b>	<b>ERIH</b>	<b>Norwegian list</b>	<b>Ulrich's</b>
Applied Ethics		Business and Administration	Business and economics
Film, Television and Digital Media		Development Studies	
Journalism and Professional Writing		Economics	
Urban and Regional Planning		Ethnology	
Visual Arts and Crafts		Geography	Geography
		Library and Information Science	Library and information sciences
		Political Science	Political science
		Sociology	Sociology



# **Options for a Comprehensive Database of Research Outputs in Social Sciences and Humanities**

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“Towards a Bibliometric Database for the Social Sciences and the Humanities”  
set up by the Standing Committees for the Social Sciences and the Humanities  
of the European Science Foundation (ESF)

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## Executive Summary

This report presents the outcomes of a study aimed at:

- A. Examining the potentialities of current bibliographic databases of scientific-scholarly literature as sources of indicators of research performance in social sciences and humanities (SSH);
- B. Highlighting actual practices in using bibliometric indicators in SSH fields
- C. Exploring means of capturing and assessing non-published outputs.
- D. Proposing options for the creation of a comprehensive database of research outputs in these domains of scholarship.

## Background

### *Trends in research policy and management and in academic publishing*

During the past decade research performance assessment has become increasingly important. In addition, major developments took place in academic publishing and the availability of bibliographical data.

- At a national scale bibliometric indicators are used in several countries for the calculation of parameters in funding formulas. At the institutional and departmental level bibliometric indicators are used as benchmarking tools.
- The European Commission launched the concept of a European Research Area, and underlined the need for public information systems on higher education institutions, including data on their research performance.
- There is a growing policy interest in social sciences and humanities and a need for adequate tools for research assessment in these domains of human scholarship.
- ‘Open access’ models of scientific publishing become increasingly important. More and more scientific-scholarly documents are deposited in freely accessible institutional repositories.

### *Research outputs and their impacts*

Research performance is a multi-dimensional concept. Table S1 distinguishes major forms of research output, and their primary impacts. A crucial distinction is between the impact a piece of work has upon the advancement of scientific-scholarly progress, and other types of impact: educational, economic and socio-cultural.

**Table S1: Research outputs and their impacts**

<i>Publication/text</i>	<i>Non-publication / non-text</i>	<i>Impacts</i>
Research paper; research monograph or book chapter	Research data file; video of experiment	Scientific-scholarly
Student textbooks; course syllabi	Academically educated persons (PhDs)	Educational
Patent	Product; process; device; design; image	Economic
Newspaper article;	TV interviews; Performances; exhibits; events	Socio-cultural

### ***Indicators***

Research assessment may focus on a variety of aspects. Table S2 presents main aspects assessed with bibliometric indicators, and the minimal requirements one should impose on a bibliographic database in order to be able to calculate the various indicators.

**Table S2: Main bibliometric indicators and minimal database requirements**

<b><i>Concept</i></b>	<b><i>Operational definition</i></b>	<b><i>Minimal database requirements</i></b>
Output	Nr. written documents published	Bibliographical data in publications; categorization of publication types.
Importance of a publication source	Impact factor; expert ratings	Source categorizations
Citation impact	Citations	Cited references of source publications included (citation index)
Collaboration	(Institutional) co-authorship	All authors/ and their institutional affiliations included in the database
Semantic structures	E.g. co-word maps	Titles, abstracts, key words.
Qualitative citation analysis	Citation context analysis	Full texts
Semantics-based detection of links	E.g., scientific instruments mentioned in full texts	Full texts

### ***Bibliographic versus bibliometric databases***

It is useful to make a distinction between two main types of bibliometric work.

- *'Desk-top'* bibliometrics, according to which any user collects simple, directly available indicators from a database.
- *Advanced* bibliometrics, involving strict data collection protocols, data verification processes, and the calculation of sophisticated indicators.

A related distinction is that between a (primarily) *bibliographic* and a (primarily) *bibliometric* database. The first is primarily designed for literature retrieval, the second primarily for bibliometric applications, primarily calculation of indicators. It must be noted that several important bibliographic databases have implemented bibliometric features. This is especially true for Thomson Reuters' Web of Science and Elsevier's Scopus.

### ***Bibliographic databases in social sciences, humanities and science***

- In *science*, researchers lay their research results down in short papers and try to get those papers, at least the really important ones, placed in prestigious international journals. This explains the success of the Science Citation Index, both as a bibliographic tool and a source of bibliometric indicators.

- In *SSH*, there is a greater diversity of document types (Nederhof, 2006). Journal articles are only a minor part of research output. A substantial part is communicated through books, especially in the humanities. There is less concentration in a limited number of international-scale journals. Much more often than in science, national or regional journals are important.
- The *bibliographic and bibliometric implications* of this are far-reaching. Since citation indexes use mainly journals as sources, they have a limited bibliographic coverage in *SSH*. In the course of history, meeting different needs, a great diversity of bibliographies and catalogs emerged from different institutions, organizations and agencies, which only if taken together provide a complete picture of scientific research in *SSH*.

## A. Potentialities of current bibliographic databases

### *General overview*

Table S3 presents a comprehensive overview of publication and citation databases containing *SSH* outputs.

**Table S3: Overview of publication and citation databases**

<i>Type of database</i>	<i>Typical examples</i>
<b><i>Sources of publication data</i></b>	
National bibliographies	
Library catalogues (OPAC)	US Library of Congress; Academic Libraries; OCLC Worldcat (Academic library catalogs)
Short title catalogues	English Short Title Catalogue (ESTC); National bibliographies for older books
Publisher or vendor catalogues	Amazon.com; Springer ebook catalogue
Special source catalogues	Ulrich's Periodicals Directory
Special bibliographies and abstracts	FRANCIS, Sociological Abstracts, PsychInfo, ECONLIT, ...
Citation indexes	Web of Science, Scopus
Repositories (in principle open access)	Institutional repositories
Google Scholar and Google Book Search	
Institutional research management systems	Output registration systems based on annual research reports, e.g., METIS in the Netherlands
<b><i>Sources of citation data</i></b>	
Citation Indexes	Web of Science (SSCI, A&HCI), Scopus
Special bibliographies	Most do not have citations. Exceptions include PsychInfo, Sociological Abstr, World Political Abstr,...
Repositories	Most repositories do not have an index to citations. Exception is CiteseerX;
Google Scholar	Harzing's publish-or-perish software uses Google Scholar to obtain raw citations
CrossRef	Cross-publisher linking system provided by publishers

### ***A survey of 27 special bibliographic databases***

A survey of 27 special bibliographic databases of scientific-scholarly literature in specific (sub-)disciplines in social sciences and humanities showed that there are several very interesting databases for field-specific studies of citation impact. It is undoubtedly worthwhile to further explore these databases.

But the overall conclusion must be that most databases do not include data on authors' institutional affiliations and contain no cited references. Databases lacking this information cannot be used directly for bibliometric analyses of publication output, formal scientific collaboration and citation impact at the level of authors or institutions.

It is also important to emphasize that the current versions of these databases contain mainly journal articles. Books would still be underrepresented in the compound database.

### ***Recent developments in Web of Science and Scopus***

Thomson Reuters' Web of Science (WoS) and Elsevier's Scopus recently expanded the coverage of SSH publications.

#### *Thomson Reuters' Web of Science.*

- The number of journals covering social sciences (SSCI) increased during the past 6 years by about 50 per cent, from 1,700 in 2002 to 2,400 in 2009. Journals covering arts and humanities and included in the arts and humanities (A&HCI) showed a 24% growth, from 1,122 in 2002 to 1,395 in the beginning of 2009. Thomson Reuters expects to reach a total of 1,500 A&HCI journals by the end of 2009. A substantial number of newly covered SSCI and A&HCI are included in the ERIH (European Reference Index for the Humanities) journal lists.

#### *Elsevier's Scopus*

- Scopus plans to expand in 2009 its journal coverage with about 3,500 social sciences and humanities journals. Of these, 1,500 will be added in April 2009. 2,250 of these are included in the ERIH journal lists. (European Reference Index for the Humanities). In fact, all ERIH journals categorized as "A", over 1,000 "B" journals and 250 "C" journals will be included.
- In addition, Scopus plans to include bibliographic meta-data on a number of highly cited books, including full title, book publisher, and all authors, and their institutional affiliations. It must be noted that the cited references in these books will *not* be included.

### ***Google Scholar and Google Book Search***

*Google Scholar* is the only database exploiting books as sources of citation links. Little is known in terms of the sources covered, and the accuracy of citation links. The degree of stability over time is also an issue of concern. Indicators are based on absolute counts, and do not take into account any form of subfield normalization.

*Google Book Search* (GBS) has two principal aims: making a book as easy to find as a webpage and enhancing the user's ability to access and read books; and providing an opportunity for authors and publishers to make their books available. It has two sources: Partner program: Publishers and authors transmit the contents of the books for the integration in GBS; and the Library project: GBS has scanned the collections of partner libraries.

Thus far Google has scanned several million of books. The ultimate aim is to include all book titles from all public and academic libraries all over the world. For books protected by copyright, search results are limited to meta-data and selected (random) text passages. Books out-of-copyright may be read online in full length or downloaded. To the best of our knowledge, cited references are not a part of meta-data. But GBS books appear as targets in Google Scholar.

### ***European institutional repositories***

Repositories are electronic archives of scientific-scholarly documents. In principle they are Open Access (OA) archives, freely accessible on the Internet – though, for copy right reasons, there may be limiting conditions. They serve, as portals, to inform users about the documents in the database and give them access to these. Therefore the title description and subject indexing are sometimes poorly standardized.

In the European context the DRIVER project plays a key role (Digital Repository Infrastructure Vision for European Research). DRIVER aims to establish an infrastructure of Digital Repositories within Europe, offering services to both researchers and the general public. It builds an infrastructure for the future knowledge of the European Research Area. DRIVER will deliver any form of scientific output, including scientific/technical reports, working papers, pre-prints, articles and original research data.

In 2006 about 230 European institutions had implemented a digital repository. On the basis of a questionnaire sent out to these institutions with a response rate of 46 per cent, it was found that the repositories in the replying institutions cover 37 % of institutions' recent publication output. Thirty per cent of included materials covers social sciences and humanities, and 18 per cent of materials is books /chapters. About 30 per cent of deposited materials were found to be full text publications.

## **B. Actual practices in using bibliometric indicators in SSH fields**

This report presents a detailed description of current practices in the evaluation of research in social sciences and humanities carried out in an important, scientifically emerging, European country: *Spain*. It introduces the most important features of research evaluation common to all fields in Spain. And subsequently, it goes over the

criteria for the evaluation of research performance in SSH, used by the different Spanish institutions in charge of research evaluation, focusing specifically on the use of publication based indicators. The following three organizations are discussed:

- National Commission for the Evaluation of Research Activity (CNEAI, Comisión Nacional Evaluadora de la Actividad Investigadora);
- National Evaluation and Foresight Agency (ANEP, Agencia Nacional de Evaluación y Prospectiva);
- National Agency for Quality Assessment and Accreditation (ANECA, Agencia Nacional de Evaluación de la Calidad y Acreditación).

Different scientific activities lead to different types of publication. It is necessary to distinguish between the different publication types in order to evaluate properly and it is important to agree on standard measures to evaluate SSH, which is a difficult task, given the subjective nature of the disciplines in these fields. The current evaluation systems are considering mainly papers in journals and as a result of this great part of the research output in SSH is being ignored. Another difficulty is the disagreement on evaluating criteria, “different evaluation bodies should apply the same criteria in order to have a solid and unique system for evaluating publications”.

In Spain there have been some initiatives to explore and evaluate the distinctive features of the research performance in SSH. One of the most important works is the joint project of ANECA and Institute of Science and Technology Documentary Studies (IEDCYT) for the establishment and supervision of a journal database covering the SSH, DICE (Difusión y Calidad Editorial de las Revistas Españolas de Humanidades y Ciencias Sociales y Jurídicas). A next step started recently is an analysis of the viability of creating a weighted classification of non-internationalized journals, for which there are no indexes with quality relative indicators, and to catalog the main scientific production diffusion media in SSH.

Recently it has been created in Spain the SCImago Journal & Country Rank (SJR), a portal publicly available which includes journals and country scientific indicators developed from the information contained in the Scopus database. This is an important tool for the evaluation of the SSH because it enables users to evaluate research performance in these disciplines per journal and also per country.

### **C. Capturing non-publication output in national research evaluation exercises**

In evaluations of national excellence in research, it is important to consider categorizations and databases on other types of outputs than publications in the Social Sciences and Humanities (SSH). For instance, in the Performing Arts, a performance might constitute such an output. Chapter 5 of this report describes how recent large national research evaluation exercises in Australia and especially in the United Kingdom have dealt with these non-published output forms.

The UK RAE 2008 offers an extensive description of the types of non-publication output that might figure in assessments of research output in the humanities and some social sciences. However, the RAE 2008 supporting material is not very helpful in

outlining concrete standards or reference values that might assist in research assessments. In essence, this is left to the judges.

RAE 2008 outcomes seem to rely for an important part on written publications such as monographs, book chapters and journal articles, even for the subpanel Drama, Dance and Performing Arts. A frequently encountered problem with Practice as Research was that researchers failed to link submitted PaR output satisfactorily to research. Here, text (scholarly apparatus) was deemed essential. This means that it will not be sufficient to establish a database containing just non-publication output; it will often (if not always) be necessary to include supportive material concerning research credentials, research content and research imperatives.

From the above, it becomes clear that formal yardsticks for scholarly non-publication output are largely missing in the assessments that were reviewed. Especially the Australian and UK assessments are known to be relatively advanced and developing. Although in all disciplines publication output is not uncommon, in parts of several disciplines, non-publication output is of some importance.

For performances, the outlets might be ranked according to prestige. Similarly, media might be ranked according to prestige. RAE 2008 outcomes indicated that it will not be sufficient to establish a database containing just non-publication output; it will often (if not always) be necessary to include supportive material concerning research credentials, research content and research imperatives.

## **D. Options for creating an inclusive database of the outputs from SSH fields**

This chapter discusses the following options for creating a comprehensive database of outputs in social sciences and humanities research.

1. Combine a number of existing European special SSH bibliographies.
2. Create a new database of SSH outputs from publishers' archives.
3. Stimulate further enhancement of SSH coverage of Web of Science and /or Scopus.
4. Stimulate further development of institutional repositories.
5. Stimulate creation and standardization of institutional research management systems.
6. Explore the potentialities and limitations of Google Scholar and Google Book Search

### ***1. Combine existing special SSH bibliographies***

One option is to examine the feasibility of combining a number of special bibliographies covering specific (sub-) disciplines –or at least a substantial number of these– and create one comprehensive bibliographic database.

One would have to standardize database structures and data fields across databases, as well as the selection criteria for including sources , and this would involve a major effort. Most of these databases do not contain cited references, and do not include data on institutional affiliations of publishing authors. Therefore, these cannot be used directly for bibliometric analyses of publication output, collaboration and citation

impact at the level of authors or institutions. It is also important to emphasize that the current versions of these databases contain mainly journal articles. Books and other non-journal items would still be underrepresented in the compound database.

## ***2. Create a new database of SSH outputs from publishers' archives***

According to this option, one would create a database more or less 'from scratch', by collecting publication (and citation) data directly from the publishers. An excellent example of this approach is the plan of the Spanish Minister of Science and Education and the Spanish Research Council (CSIC) to create a citation index of Iberian research publications.

The new database would not merely include journal articles, but also books (both monographs and edited volumes as well as conference proceedings). Moreover, it would have both a bibliographic and a bibliometric function. A major issue is how to establish quality criteria for inclusion of sources in the new database.

## ***3. Further enhance SSH coverage in Web of Science and Scopus***

Thomson Reuters' Web of Science (WoS) and Elsevier's Scopus recently expanded the coverage of SSH publications. Both producers are commercial enterprises operating in a common market. It is plausible to assume that they may be willing to further expand their SSH coverage if there is a market for it.

Following this line of reasoning, and taking into account the crucial importance of books in written scholarly communication in SSH fields, Thomson Reuters and Elsevier might be interested in further expanding the book coverage of their databases. This expansion would not only involve the inclusion of complete bibliographic meta data on 'important'(e.g., highly cited) books, but also the processing and inclusion of the cited reference lists in books.

## ***4. Stimulate further development of institutional repositories***

It is not unrealistic to assume that currently only some 10 per cent or so of the recent (1-5 year old) publication output of European Higher Education Institutes (HEI) is included in institutional repositories. Nevertheless, the IR system provides in principle good opportunities of the creation of a comprehensive database of SSH research outputs, if institutions are further stimulated to deposit their output and thus increase the IR coverage.

Stimulating institutions to deposit their research outputs should not be merely be founded in the notion of Open Access, but also be linked to the need for HEI's and public research organizations to develop and use internal research management systems. These will be discussed further below

A first step would focus on harvesting 'standard' bibliographic meta-data of deposited publications across repositories. A second step would aim at capturing cited references contained in the publications. In this way, in the end a comprehensive journal article and book citation index can be created.

### ***5. Stimulate creation of institutional research management systems***

The globalization of teaching and research, and the need for universities to compete with one another in an international market, increased the need for research policy officials, managers and the general public for ‘objective’ information about the institutions’ performance.

In view of these trends, institutional research management systems containing information on research carried out in an institution, – including lists of publications made by its researchers – are becoming increasingly important. A typical example is the research information system METIS system in the Netherlands. Technically such a system can be linked to an institutional repository. Such research management systems tend to be up-to-date, cover all document types (including non-published ones), and make some useful, methodical categorizations.

Although at present such systems have not yet reached the levels of extensiveness and standardization needed to be used for bibliometric purposes, in view of their increasing importance their construction could be further stimulated and standardized, possibly within the framework of an initiative of the European Commission. Eventually they could be fully integrated with the system of institutional repositories

### ***6. Explore the potentialities of Google Scholar and Book Search***

Google Scholar is a valuable database of scientific-scholarly literature, since it is the only database exploiting books as sources of citation links. But as a bibliometric tool it has certain limitations that have to be examined in more detail. The major one is perhaps that users have no full insight into which sources are actually covered. It is plausible to assume that Google Scholar harvests the institutional repositories mentioned above. Markland (2006) has conducted searches to see how easily items could be retrieved from a repository using both Google and Google Scholar (varying searches using phrase/keyword from the title and full title) and found that Google retrieved a higher percentage of items overall, but Google Scholar retrieved a higher percentage of items exclusively from the repositories. Regarding the accuracy of citation links, a recurring issue was the exact status of the document (i.e., preprint, latest version or author’s final version). The degree of stability over time is also an issue of concern, and there is as of yet no categorization of all sources into (sub-) disciplines. Nevertheless, Google Scholar has an enormous potential as a source for bibliometric analysis.

This is also true for Google Book Search. It is a most interesting project, aimed at eventually creating a ‘database’ of all book titles available in academic and public libraries. To the best of our knowledge cited references in processed book titles are not a part of meta-data, but in principle it is technically feasible to extract cited references. GBS books already appear as publications in Google Scholar. It would be possible to further integrate Google Scholar and Google Book Search and create a citation index of journal articles *and* books.

It would therefore be an option to build upon the exploratory studies of Google Scholar conducted thus far, and start up large scale projects aimed at further exploring the use of Google Scholar for bibliometric purposes, especially for the calculation of

indicators of research performance in social sciences and humanities. At the same time, one should collect more information about Google's future plans, especially those related to further integrating Google Scholar and Google Book Search.

### ***Concluding remarks***

The options described above are not mutually exclusive. In fact, we believe all developments highlighted above – except perhaps that described under the first option - will continue in the coming years: the creation in Spain of an Iberian database is expected to go on; Thomson Reuters and Elsevier will further enhance the coverage of social sciences and humanities fields; Google will further enhance its products Scholar and Book Search and possibly integrate them; and institutional repositories and research management systems will further develop.

It is difficult to forecast the speed of these developments. Much depends upon the extent to which it will be possible to combine them in a way that is profitable for all stakeholders involved. In any case, it is clear that standardization and availability of linking and usage data become increasingly important, also within the context of the creation of a comprehensive database of SSH research outputs.

## **1 Scope and structure of the report**

In the end of 2009 the European Science Foundation (ESF), the Agence Nationale de la Recherche (ANR) in France, the Deutsche Forschungsgemeinschaft (DFG) in Germany, the Economic and Social Research Council (ESRC) and the Arts and Humanities Research Council (AHRC) in the UK launched a European Scoping Project aimed to examine the feasibility and development of a robust bibliometric database for assessing the impact of all types of research output in social sciences and humanities (SSH).

Therefore, a scoping project was therefore agreed in order to examine and report upon the feasibility and nature of bibliometrics system which might be valid in the social science and humanities domains. The partners established a Project Board that commissioned two mini-studies:

1. to examine and review the coverage, robustness and potential of current bibliometric databases covering the Social Sciences and the Humanities. These include the WoS, ISI, Scopus, Google Scholar, the European Reference Index in the Humanities, among others.
2. to suggest the most cost effective means of developing a comprehensive and robust bibliometric database (with appropriate coverage of journal articles, books, book chapters, government and commissioned reports, and other publications, including those not in the English language and available through Open Access) for assessing the impact and quality of published material across the Social Sciences, the Humanities and related domains, such as the Performing Arts and environmental studies.
3. to explore means of capturing and assessing non-published outputs.

This report presents the outcomes of one of these mini-studies. After consultation with the Project Board, and – during the project – also with the group conducting the second mini-study, aimed at avoiding duplication among the two studies, it was eventually decided that the study presented in this report would focus on the following issues:

### **1. Comparison of the strengths and weaknesses of different databases**

This part of the project aims at creating a survey of major bibliographic databases of scientific-scholarly literature in social sciences and humanities, and assessing their aptness for use in bibliometric analysis.

### **2. Analysis of the quality criteria used to assess published output.**

This section will present a description of current practices in the evaluation of research in social sciences and humanities carried out in an important, scientifically emerging, European country: Spain.

### **3. Current practices in capturing non-published outputs and analysis of the quality criteria used in judging non-published outputs**

The main objective of this part of the project is to make an inventory of how the major national research assessment exercises, in the UK and Australia, dealt with the categorization and assessment of other types of research outputs than publications in social sciences and humanities, particularly in the arts.

#### **4. Options for creating an comprehensive database of the outputs from SSH fields**

The main task is to provide a comprehensive analytical framework that takes into account relevant stakeholders, major technical aspects, and broad options as regards a possible inclusive database of SSH outputs.

The *structure of this report* is as follows. **Chapter 2** provides a general introduction to the issues addressed in this report, and serves as a background. It also addresses the relative importance of the various publication types in SSH fields. **Chapter 3** analyses the strengths and weaknesses of a series of bibliographical databases. **Chapter 4** describes actual assessment practices in Spain. The issue of non-publication outputs is addressed in **Chapter 5**, whereas **Chapter 6** discusses options for creating a comprehensive database for social sciences and humanities.

## 2 General introduction

The social sciences and the humanities (SSH) are increasingly under pressure to catch up with the metric research performance evaluation efforts which have got a strong hold on the world of hard science over the last thirty years. To date the pressure is still coming more from outside, from administrators, research managers, policy makers and professional bibliometricians, than from inside, from the researchers themselves and their representative bodies, but this should be no reason to neglect the forces at work.

However, to win over those actively involved in SSH research and to show that evaluative metrics is more than a toy of technocrats, the developers of SSH assessment tools should be utterly sensitive to the specifics of the research and communication patterns of SSH disciplines and carefully investigate what is profitable to measure (profitable in a broad sense, not only economically), in order to construct representative, fair and relevant quantitative indicators. This scoping study will attempt to point out some promising opportunities, while at the same time indicating current and enduring limitations.

While the situation in the sciences will be seen by many as a benchmark, it is worthwhile to first consider some characteristic features of the assessment practices in science, which have not, or not yet, become commonplace in SSH. These differences between social sciences and humanities on the one hand and the natural, technical and life sciences on the other, are outlined in *Section 2.5*. But first we highlight in *Section 2.1* a series of general trends in science policy and management, academic publishing, the creation of scientific-scholarly literature databases and the availability of bibliometric indicators. This section serves as a background for later chapters in this report. *Section 2.2* distinguishes major forms of research output, and their primary impacts. *Section 2.3* presents main types of bibliometric indicators, and the minimal requirements one should impose on a bibliographic database in order to be able to calculate the various indicators. Finally, *Section 2.4* distinguishes between bibliographic and bibliometric databases, and between ‘desk-top’ bibliometrics on the one hand, and ‘advanced’ bibliometrics on the other.

### 2.1 General trends

In most OECD countries, there is an increasing emphasis on the effectiveness and efficiency of government-supported research. Governments need systematic evaluations for optimising their research allocations, re-orienting their research support, rationalising research organisations, restructuring research in particular fields, or augmenting research productivity. In many countries research assessment processes were implemented that use bibliometric tools, both at the national scale and at the level of research institutions and departments. The development and application of bibliometric methods for research assessment has gained momentum, both with respect to available databases, construction of indicators, and their ways and scale of application.

### *Research policy and management*

- At a national scale in several countries bibliometric indicators are used for the calculation of parameters in funding formulas, aimed to allocate research funds across institutions at a national level.
- In view of the globalization of teaching and research, and the need for universities to compete with one another in an international market, research policy officials and managers and the general public need 'objective' information about the institutions' performance.
- At the institutional and departmental level bibliometric indicators are used as tools in international benchmarking and in research evaluation, combining them with expert knowledge and/or peer ratings.
- The European commission launched the concept of a European Research Area, and underlined the need for public information systems on higher education institutions, including data on their research performance.
- There is a growing policy interest in social sciences and humanities. A typical example is the European Commission's recent policy to integrate the humanities in the European Research Area. There is a need for adequate tools for research assessment in these domains of scholarship.
- Bibliometric indicators are increasingly being disseminated across the scientific-scholarly community, and are not merely instruments for peer review or research management and benchmarking tools, but also marketing tools towards the general public, for instance, a university's position in rankings of world universities publische din newspapers.

### *Academic publishing*

- Scientific-scholarly publishers make their content electronically available on-line. Typcal examples are Elsevier's ScienceDirect and Springer's Springerlink.
- More and more scientific-scholarly documents are freely available on the World Wide Web.
- 'Open access' models of scientific publishing are becoming increasingly prolific.
- More and more scientific-scholarly documents are deposited in freely accessible institutional repositories.

### *Databases; availability of indicators*

- Increasingly institutional or disciplinary repositories are being created, leading to a further standardization of meta-data and meta-data infrastructures.
- More and more higher education institutions create institutional research management systems including data on the institutions' scientific-scholarly outputs.
- The comprehensive citation indexes of Thomson Reuters (Web of Science (WoS)), Elsevier (Scopus) and Google (Google Scholar) are genuine competitors.
- WoS and Scopus are strongly expanding their source coverage of social sciences and humanities fields
- Bibliographical databases implement bibliometric features, for instance, simple bibliometric indicators such as journal impact measures and authors' Hirsch indices. The calculation of bibliometric indicators is not merely done by bibliometric experts.

## **2.2 Research outputs and their impacts**

Research performance is a multi-dimensional concept. Table 2.1 distinguishes major forms of research output, and their primary impacts. A crucial distinction is that between the impact a piece of work has upon the advancement of scientific-scholarly progress, and other types of impact: educational, economic and socio-cultural. The table does not show all the possible types of output. It aims at showing major ones, and how outputs and impacts are related.

**Table 2.1: Research outputs and their impacts**

<i>Publication/text</i>	<i>Non-publication / non-text</i>	<i>Impacts</i>
Research paper; research monograph or book chapter; report	Research data file; video of experiment	Scientific-scholarly
Student textbooks; course syllabi	Academically educated persons (PhDs)	Educational
Patent	Product; process; device; design; image	Economic
Newspaper article; report	TV interviews; Performances; exhibits; events	Socio-cultural

## **2.3 Indicators**

Research assessment may focus on a variety of aspects. Two core aspects are *output* and *impact*. Metrics in terms of mere output counts numbers of outputs made; metrics concerned with the reception of research publications by other users than the author(s) himself (themselves), is targeting impact. In both cases the quality of research is

envisaged in an indirect way. As quality in itself is difficult to pinpoint, the productivity and impact can be used as measurable substitutes, as these are assumed to have some kind of positive relationship with scientific quality.

Table 2.2 presents main aspects assessed with bibliometric indicators, and the minimal requirements one should impose on a bibliographic database in order to be able to calculate the various indicators. The overview of indicators is far from complete, but the most important ones are included. For a more comprehensive list the reader is referred to the EERQI report (EERQI, 2008).

**Table 2.2: Main bibliometric indicators and minimal database requirements**

Concept	Definition	Minimal database requirements
Output	Nr. Written documents published	Bibliographical data in publications; categorization of publication types.
Importance of publ. source	Impact factor; expert ratings	Source categorizations
Citation impact	Citations	Cited references of source publications included
Collaboration	(Institutional) co-authorship	All authors/ and their institutional affiliations included in the database
Semantic structures	e.g. co-word maps	Titles, abstracts, keywords.
Qualitative citation analysis	Citation context analysis	Full texts
Semantics-based detection of links	e.g., scientific instruments mentioned in full texts	Full texts

Measurement of publication output can only be carried out in a database containing full bibliographical data on publications, as well as a categorization of publications into main types, including journal article, monograph, book chapter, edited work, book review, research report. In output measurement the nature and importance of a publication source is a crucial aspect. It can be assessed by using citations (in a citation database) or by collecting expert ratings or categorizations such as the ERIH categorization of journals in a number of SSH disciplines. In the ideal case such categorizations are included in the database used for bibliometric analysis, but this is seldom the case.

Scientific-scholarly collaboration is a policy relevant, often assessed aspect of research performance. It is bibliometrically analyzed by using co-authorship data that are assumed to reflect ‘formal collaboration’. Author collaboration can only be studied in a database that contains bibliographic information on *all* authors of a publication. In order to assess institutional or international collaboration the database should contain the institutional information of *all* authors of a publication.

Qualitative citation analysis focuses on the *context* of citations and may reveal something of the function of a cited work in the citing text, or even of the appreciation of it by the citing author. A typical example of a semantics-based link analysis is a study aimed at assessing the impact of a particular scientific instrument upon scientific research, by counting the number of times these are mentioned in the full

text of a large number of scientific publications. These two types of analysis can only be carried out in a database that contains the *full texts* of scientific-scholarly publications.

In bibliometric studies of science the focus has increasingly been on citation impact analysis, but there is no reason to exclusively identify performance bibliometrics with citation analysis. In order to broaden the spectrum of impact analysis, it should from now on become a task of bibliometrics to look into the potentialities of ‘usage’ data, including library loans, web downloads, library holding distributions, and book sales, and of hyperlink connections. There is place for new data-mining techniques and interfaces, supplementing the current citation impact techniques. In order to analyze ‘usage’, detailed data on the actual use, e.g., obtained from an analysis of the log files of databases are needed.

## 2.4 Bibliographical versus bibliometric databases

We believe that it is useful to make a distinction between two main types of bibliometric work that are summarized in Table 2.3. The first could be denoted as ‘*desk-top*’ bibliometrics, in which any user collects simple, directly available indicators from a database. The second can be labeled as *advanced* bibliometrics, involving strict data collection protocols, data verification processes, and the calculation of sophisticated indicators.

**Table 2.3: Two types of bibliometric activity**

Type of activity	Description	Type of database used
Desk-top or poor man’s bibliometrics	Collects simple indicator data directly from database	Bibliographic database; indicator sets
Advanced bibliometrics	Data collection protocols; verification; sophisticated indicators	Bibliometric database

A related distinction is that between a (primarily) *bibliographic* and a (primarily) *bibliometric* database. The first is primarily designed for literature retrieval, the second primarily for bibliometric applications. Typical features of a bibliometric database are:

- cited references are parsed and accurately linked to corresponding targets (citation index);
- institutional affiliations are de-duplicated;
- author names are linked to unique researchers;
- abstracts are parsed into noun phrases;
- dates are expressed as numbers;
- publications are categorized into policy relevant scientific-scholarly subfields;
- acknowledgements are parsed; names of funding institutions are de-duplicated.

It must be noted that several important bibliographic databases have implemented bibliometric features. This is especially true for Thomson Reuters’ Web of Science and Elsevier’s Scopus.

## 2.5 *Bibliographical databases in social sciences, humanities and science*

Characteristic for the sciences is the availability of citation databases which cover such a large part of the top-end of the relevant scientific literature that they provide on their own sufficient bibliographic and bibliometric data to allow representative measurements of the output and impact of the researchers and the research groups involved. The Science Citation Index (SCI), owned by Reuters Thomson, and made accessible on the Internet by the Web of Science (WoS), processes the most important international scientific journals in the entire field of science, applying a uniform meta-data format which includes traditional bibliographic description elements, abstracts, references and citations, and a (journal based) subject classification. On top of the meta-data a broad range of statistical data is presented (number of publications and citations, half life citedness, h-index, etc.), which are easy to use and provide concrete bibliometric applications.

The success of the SCI in bibliometric terms had not been possible without a fundamental aspect of scientific communication in science, namely that it is very much a monoculture. Researchers lay down their research results in short papers and try to get those papers, at least the really important ones, placed in the prestigious international journals, which thereby have increasingly come to dominate scientific communication. Subsequently, a very large majority of those journals is covered by the SCI, which in itself has become a further incentive for authors to publish in the journals which are SCI sources, because not publishing there punishes itself in assessment terms. All is working toward a closed communication system, which is relatively easy to control by a universal and uniform system of meta-data in one single database.

The success of the SCI, which was launched by the Institute for Scientific Information (ISI) in 1963, has recently led Elsevier to build its own citation index Scopus. From 1985 on, the Leiden Center for Science and technology Studies (CWTS) has extended the SCI database so that it became possible to assess the performance of research groups, which in science are the pivotal research units, against the background of international field norms.

**Table 2.4: Science vs. Social Sciences and Humanities**

	Science	Soc Sciences & Humanities
Source/ document types	Journal research article is main type	Great diversity; books important (e.g. monographs, edited works), including archived documents and rare books
Journal system	Concentration in limited number of international journals	Less concentration; national journals also important
Bibliographical system	Concentration in limited number of large international databases	Great diversity of bibliographies and catalogs (national, specialized)

Directing our attention to the SSH, we observe immediately that there are some major differences with science. These are summarized in Table 2.4. The bibliographic and bibliometric tools and procedures in the SSH are less united and uniform than in the science model. The WoS Social Sciences Citation Index (SSCI; since 1973) and the WoS Arts and Humanities Citation Index (A&HCI; since 1987) have never gained a position in most SSH disciplines comparable with that of the SCI in science, neither as a bibliographic retrieval instrument, nor as a bibliometric tool.

The main reason is that, in the SSH, the diversity of important document types is considerably larger. Journal articles make up only a minor part of research output. A substantial part, often even a preponderant part, is communicated through books: either books as independent publications (monographs or books belonging to book series), or ‘dependent’ contributions to books (book chapters, e.g. in conference proceedings and *Festschriften*). Particularly in the humanities books play a far greater role in scientific communication than in science. As far as journals are concerned, a further diversifying element is the fact that in SSH national or regional journals are more important. There is less concentration in a limited number of international-scale journals than in science.

The bibliographic implications of this are far-reaching. Since citation indexes use only journals as sources (and, moreover, only journals with an international outreach), SSCI and, in particular, A&HCI have a limited bibliographic coverage. Hence, to get a full picture of research accomplishments, one has to draw upon additional bibliographic data and databases. In the course of history, meeting different needs, a great diversity of bibliographies and catalogs has emerged from different institutions, organizations and agencies, if taken together provide a complete picture of scientific-scholarly research in the social sciences and the humanities.

The bibliographic description of books (for all subject fields) has traditionally been taken up by libraries: national libraries producing national bibliographies, and academic libraries producing collection-bound catalogs. However, national libraries and university libraries mostly lacked the capacity and the affinity for the bibliographic disclosure of journals on the article level; nor have their housekeeping duties - to a large extent the handling of physical volumes - point to that direction. So, with time, the bibliographical dealing with journal articles and with other ‘dependent’ or ‘hidden’ publications has become the task of specialist ‘documentation’ institutes and agencies, which have taken care of the international bibliographic description in a particular field.

Formerly the so called ‘special bibliographies’ (*Fachbibliographien*) were periodically printed publications, nowadays these have changed into digital databases. Sometimes they also cover some books (e.g., dissertations, or books in as far as they are reviewed in journals), but essentially they remain bibliographies of non-monograph material. Special bibliographies often overlap considerably. In contrast with national bibliographies and library catalogs, most special bibliographies are not freely accessible on the Internet. Commercial providers of special bibliographies (e.g. CSA Illumina, Ovid-SP, EBSCO, OCLC, Ingenta) normally make these accessible through a common interface.

Historically we may discern three different types of special bibliographies:

1. Special bibliographies: title description and fine subject indexing (through classification terms and/or subject terms)
2. Abstracts bibliographies: title description, broad subject indexing, and abstract
3. Citation indexes: title description, broad subject indexing, abstract, and literature references

In digital databases abstracts, bibliographies have often been merged with special bibliographies, so that, in the end, two types of special bibliography remain: special bibliographies with and special bibliographies without literature references. Only the latter type, the citation indexes, support citation impact studies. The first type, however, has the advantage of providing more specific and fine-grained subject indexing, since the indexing is conducted on the article level, whereas in the WoS citation indexes the article subject is automatically derived from a general subject field classification of the journal which published the article.

The citation indexes are a recent branch on the stem of special bibliographies. Designed from the beginning by Eugene Garfield as an instrument for information retrieval, SCI and other citation indexes have since then proven to be especially useful for SDI purposes (Selective Dissemination of Information), and, perhaps above all, for citation impact analysis. There is no exaggeration in saying that the citation indexes have transformed the static bibliographic universe of hierarchically categorized monads into a dynamic network universe, where bibliographic entities are linked by citing-cited relationships in constantly evolving constellations.

In fields such as science, where the citation indexes supply an adequately complete bibliographic picture of the research output, since the most relevant part of that output is concentrated in international core journals (and books and book chapters play a minor role), they have largely replaced older special bibliographies of the first type. In SSH, however, a simultaneous study of different bibliographic databases still is required, in particular if a reasonably complete picture of the research output is required. In the humanities, and to a lesser extent in the social sciences national bibliographies, book catalogs, and traditional special bibliographies still cover much ground which is passed by in A&HCI and SSCI.

### 3 Analysis of databases of SSH publications

*Section 3.1* of this chapter presents an overview of publication and citation databases covering research publications in social sciences and humanities. *Section 3.2* presents the outcomes of an analysis of 27 publication databases. *Section 3.3* highlights important recent developments and future plans as regards the coverage of SSH publications in Thomson Reuters' Web of Science and Elsevier's Scopus, while *Section 3.4* dedicates attention to Google Scholar and Google Book Search. *Section 3.5* of this chapter provides information on institutional repositories, especially within a European context as well as on the DRIVER project (Digital Repository Infrastructure Vision for European Research). Finally, *Section 3.6* focuses on the plan of creating an Open Access library of books in SSH by the OAPEN network (Open Access Publishing in European Networks).

#### 3.1 *Comprehensive overview of publication and citation databases*

This section starts with an overview of publication and citation databases covering the various types of research publications in SSH. It ends with a discussion of meta-data. For **books** there are the following sources. They cover both monograph titles and titles of volumes belonging to a series.

**1. National bibliographies**

**2. Library catalogues (OPAC's)**

The library OPAC's (On-line Public Access Catalogues) are strictly speaking not bibliographies, while they are tied to local (physical) collections. But in particular the catalogues of the biggest libraries (e.g. Library of Congress, also known for its classification system and subject headings; British Library; Bibliothèque nationale de France), and union catalogues or aggregator catalogues (the most important of them is OCLC WebCat) serve bibliometric purposes often better than national libraries, while they transcend national boundaries.

**3. Short Title Catalogues**

These catalogues (e.g. ESTC: English Short Title Catalogue; STCN: Short Title Catalogue Netherlands) may be seen as national bibliographies for older books. They are valuable assets for historical bibliography and historical bibliometrics. For the evaluation of current research they are not interesting.

**4. Publisher or vendor catalogues**

A quick overview of recent books is provided by e-bookshops like amazon.com.

For current **journal** titles the most important bibliography is:

**5. Ulrich's Periodicals Directory**

For bibliographic data of journal articles and other 'dependent' publications (book chapters, contributions to books) we have special bibliographies (with or without abstracts) and citation indexes. Some of the special bibliographies contain also data of books (mostly dissertations and books reviewed in journals).

## 6. Special bibliographies and abstracts

In contrast to the citation indexes, special bibliographies do not cover the entire social sciences, or the entire humanities. For historical reasons they focus on more restricted subject areas. An exception is FRANCIS, which seems to cover the social sciences and humanities in their entirety. Special bibliographies often overlap to a certain extent. Because of the ideal of Universal Bibliographic Control, special bibliographies in their particular field normally span a wider range of journals than the citation indexes. As mentioned before, also their subject indexing is more refined. Many special bibliographies contain abstracts; some of them also register citation links (PsycInfo, Sociological Abstracts, ECONLIT, WPSA, Historical Abstracts, AHL). *Section 3.2* presents an analysis of 27 databases of this type.

## 7. Citation indexes

The most important citation indexes for the SSH are SSCI, A&HCI, and Scopus. In contrast to special bibliographies, citation indexes use as their sources a selection of core journals. Book chapters (in conference proceedings, Festschriften, etc.) are not covered. The defining characteristic of citation indexes is their complete indexing of citation links. They also do well by their excellent statistical interface. Output and citation impact assessment based on the citation indexes is only possible for disciplines with high coverage. *Section 3.3* highlights some important recent developments as regards the coverage of SSH sources in Web of Science and Scopus.

Until the rise of the Internet the aforementioned sources were the ones one had to work with. Since then Google and the academic repositories have changed the landscape.

## 8. Repositories

Repositories are electronic archives of scientific documents. In principle, they are Open Access (OA) archives, freely accessible on the Internet – though, for copyright reasons, there may be limiting conditions. *Section 3.5* presents more detailed information about these repositories.

## 9. Google Scholar

The Google Scholar database seems basically to consist of books digitized by the digitizing program “Google Book Search”, and of documents taken over from the Open Access repositories or documents (e.g., pdf files posted by scholars themselves on professional homepages. Hence Google Scholar cannot be used as a methodical bibliography. *Section 3.4* presents more information on Google Scholar and Book Search.

Finally, mention must be made of another development made possible by the Internet. Many universities have started to build research management systems. One component of those systems is a complete and up-to-date overview of research output at the university, making use of bibliographic standards.

## 10. Institutional research management systems

These systems may in the future become interesting meta-data sources for bibliometric purposes. Among their strengths is that, ideally, they are up-to-date (the first data input is often by the researchers themselves), covering all document types, explicitly distinguishing between editor and author involvement, and methodically categorizing publications according to their level and/or the people addressed. If connected to institutional repositories, the possibility of direct access to the full-text documents may further enhance the use of the meta-data. At present, however, the systems have not yet reached the levels of extensiveness and standardization needed to assign them a pivotal role in bibliometrics.

Impact analysis needs different meta-data from output analysis. Not all sources listed in section 1.B.1 supply impact data. Citation analysis is certainly the most well-known of impact measurements; it is also the most interesting, because it implies a coded researcher-to-researcher, or peer-to-peer reception relationship.

The other meta-data mentioned below (downloads, hyperlinks, book purchases, library holdings, library loans) have until now not been exploited systematically to measure impact. They still have to prove their true mettle in future applications. Most of them focusing on anonymous usage, they do not share the high value of citation links. The counts of book purchases, library holdings, and library loans have the advantage that they inform us about the usage of hard-copy books, which may become a useful supplement to citation index measurements, which normally focus on journal-to-journal citation links.

All impact measurements named are based on counts related to (the usage of) research publications. There are other impact indicators, esteem indicators, such as prizes, awards, honorary degrees, invited lectures, media invitations, and so on, which may highlight a researcher's scientific stature. But, having no direct quantitative relationship with research publications, they are skipped here. Nor do we consider surveys and panel opinions, which have been used sometimes to establish the reputation of for instance journals and publishers. An exception will the journal categorization ERIH (European Reference Index for the Humanities), based on the opinions of expert panels, which can be used in output analysis to weight publications.

The following meta-data sources can be distinguished..

### 1. Citations

Sources are:

1.a. *Citation indexes*  
SSCI, A&HCI, Scopus.

1.b. *Special bibliographies*  
Citation links in: e.g. PsycInfo, Sociological Abstracts, ECONLIT, WPSA, Historical Abstracts, AHL. But most special bibliographies do not have them.

*1.c. Repositories*

Citations links in: e.g. CiteseerX <http://citeseerx.ist.psu.edu> .  
Most repositories do not have them.

*1.d. Google Scholar*

Google Scholar provides citation links and counts them.  
Harzing's *Publish or Perish* interface ( <http://harzing.com/pop.htm> ) makes more sophisticated citation counts possible than Google Scholar itself offers.

*1.e. CrossRef*

Crossref ( <http://crossref.org> ) is a cross-publisher citation linking system provided by publishers. It allows a researcher to click on a reference citation on one publisher's platform and link directly to the cited content on another publisher's platform ('CrossRef Cited-by Linking').

The citation indexes are noticeable by their great transparency and continuity. The other citation sources are more haphazard.

**2. Downloads**

Repositories often publish hit and download statistics in an anonymized form. Even here it must be allowed that the current state of development of the institutional repositories seriously diminishes the value of the statistics. Another problem may be that repository downloading is open to manipulation. In the current situation, a much richer source of bibliometric information would be the download data of licensed e-journals of commercial publishers. However, publishers being aware of their great value, they are reticent to make them freely accessible. It would be worthwhile, if in future license agreements the download data could be made accessible for bibliometric research.

**3. Hyperlinks**

URL links between web documents in open access repositories have already proven to be an interesting research object for scholars studying Web 'sitings'. They have also been used by Google as an importance ranking tool (PageRank). The underlying principle is that there is a clear analogy between URL 'sitings' in the open access Web environment and traditional document citations. In order to use hyperlinks as a source of impact measurement, it is necessary to develop a method of selecting URLs that link to documents of high scientific value.

**4. Book purchases**

Sales data are normally not publicly available. See however the Sales Rank in [amazon.com](http://amazon.com).

**5. Library holdings**

For a recent attempt to use library catalogues as a source of impact analysis, see Torres-Salinas and Moed (2009). More studies of the Leiden CWTS along the same lines are forthcoming.

## 6. Library loans

Library loans have been used in the past in theoretical distribution studies. There seems however to be no principled reason to exclude them as an input for impact analysis.

Finally, mention should be made of an experimental project integrating many of the impact approaches: <http://mesur.org/MESUR.html> . For a comprehensive, though now outdated overview of bibliographies, see: Totok and Weitzel (1984). Nearly all sources are accessible on the Internet, though for some the retrospective digitization of older data is still going on.

### 3.2 *Characteristics of selected SSH publication databases*

The following databases were analyzed:

- America: History and Life (AHL)
- Applied Social Sciences Index and Abstracts (ASSIA)
- ATLA Religion Database
- Bibliography of the History of Art (BHA)
- CSA Linguistics & Language Behavior Abstracts (LLBA)
- ECONLIT
- Education Abstracts;
- ERIC (Educational Resources Information Center);
- FRANCIS
- Historical Abstracts (HA)
- Hrčak. Portal znanstvenih časopisa Republike Hrvatske. (Portal of scientific Humanities Abstracts; journals of Croatia);
- Index Islamicus;
- Index Theologicus (IxTheo)
- International Bibliography of the Social Sciences (IBSS)
- International Medieval Bibliography (IMB)
- Library and Information Science Abstracts (LISA)
- Library Literature & Information Science Index;
- Lituanistika database of the humanities and social sciences in Lithuania;
- MLA International Bibliography (MLA)
- Philosophers Index
- PsycINFO
- RILM Abstracts of Music Literature (RILM)
- SciELO (Scientific Electronic Library Online);
- Slovenian database (The COBIB.SI union bibliographic/catalogue database) of the Slovenian Research Agency;
- Sociological Abstracts
- SOLIS (Social Sciences Literatures Information System);
- Worldwide Political Science Abstracts (WPSA)

The following aspects/questions were considered:

- Database producer
- Dates of coverage
- Which (sub)disciplines does it cover
- How many records does it contain as from the starting year?
- Which are the selection criteria of sources processed?
- Which countries or language domains does it cover?
- What type of sources does it cover (e.g., journals, books, proceedings volumes, grey literature)?
- Does it contain all authors of a source publication?
- Does it contain the institutional affiliations of all publishing authors, or only that of the first author, or no affiliations at all?
- To which extent are author names and institutional affiliations standardized?
- Which categorization of documents into document types is used?
- Which type of content classification system is implemented?
- Does it contain cited references in source publications?

The outcomes are presented in *Appendix A1*. Table 3.1 lists the databases containing authors' institutional affiliations of (at least the first author) or containing cited references of source articles.

**Table 3.1: SSH databases including at least authors' institutional affiliations or cited references**

<i>Database</i>	<i>Author affiliations</i>	<i>Cited references</i>
FRANCIS Social Sciences and Humanities	Y (All, as from '97)	N
LLBA - CSA Linguist & Language Behav Abstr	Y	N
ECONLIT	Y	Y
IBSS Internat Bibliography Social Sci	Y	N
LISA Library and Informat Sci Abstr	Y (as from 2006)	N
Psychinfo	Y (all authors)	Y
Sociological Abstr	Y (1st author only)	Y (as from 2002)
WPA - World Polit Abstr	Y (1st author only)	Y (as from 2001)
HA - Historical Abstr	N	Y
AHL - America History & Life	N	Y
ERIC - Educat Resources Informat Ctr	Y (1st author only)	N (Y in full texts)
SOLIS - Social Sci Literature Informat Syst	Y (in Author field)	N

This table shows that there are several very interesting databases for field-specific studies of citation impact. It is beyond any doubt worth while further exploring these databases. But the overall conclusion must be that most databases do not include data on authors' institutional affiliations and no cited references. In addition, these databases cover mainly – though some not exclusively - journal articles.

### ***3.3 Recent developments in Web of Science and Scopus***

This section focuses on two important multi-disciplinary citation indexes; Thomson Reuters' Web of Science (WoS) and Elsevier's Scopus. Both databases recently expanded the coverage of SSH publications.

#### *Thomson Reuters' Web of Science.*

The number of journals covering social sciences and included in the Social Science Citation Index (SSCI) increased during the past 6 years by more than 40 per cent, from 1,700 in 2002 to 2,400 in 2009. Journals covering arts and humanities and included in the Arts and Humanities Citation Index (AHCI) showed a 24% growth, from 1,122 in 2002 to 1,395 in the beginning of 2009. Thomson Reuters expects to reach a total of 1,500 AHCI journals by the end of 2009.

Thomson Reuters recently announced the expansion as from 2009 of the Web of Science journals with 1,228 "regional" journals, defined as "journals that typically target a regional rather than international audience by approaching subjects from a local perspective or focusing on particular topics of regional interest". ([http://isiwebofknowledge.com/products\\_tools/multidisciplinary/webofscience/contentexp/](http://isiwebofknowledge.com/products_tools/multidisciplinary/webofscience/contentexp/)). About half of these regional journals are published from a member state of the European Union. A substantial number of newly covered SSCI and A&HCI are included in the ERIH (European Reference Index for the Humanities) journal lists.

#### *Elsevier's Scopus*

In June 2009, Scopus plans to add almost 1,450 SSH journals. By then Scopus will cover nearly 3,500 journals in the humanities and related fields. 2,250 of these are included in the ERIH journal lists. (European Reference Index for the Humanities). In fact, all ERIH journals categorized as "A", over 1,000 "B" journals and 250 "C" journals will be included. For more information the reader is referred to [http://info.scopus.com/news/press/pr\\_081125.asp](http://info.scopus.com/news/press/pr_081125.asp).

In addition, Scopus plans to include bibliographic meta-data on a number of highly cited books. Currently Scopus hardly covers books (monographs or edited works). But books may be cited in the journals or proceedings volumes processed for Scopus. For a number of highly cited books Scopus adds bibliographic details, including full title, book publisher, and all authors, and their institutional affiliations. It must be noted that the cited references in these books will *not* be included.

### ***3.4 Google Scholar and Google Book Search***

*Google Scholar* is a valuable database of scientific-scholarly literature, since it is the only database exploiting books as a source of citation links. But as a bibliometric tool it inherits some of the same limitations as a bibliographic tool, given that its content is very heterogeneous. Little is known in terms of the sources covered, including the accuracy of citation links. The degree of stability over time is also an issue of concern. Repeating the same query at distinct points in time may yield quite different results.

Harzing's Publish or Perish interface enhances the use of Google Scholar as a citation analytic tool, calculating several indicators on the author level. However, these indicators are based on absolute counts, and do not take into account any form of subfield normalization.

*Google Book Search* (GBS) has two principal aims:

- Making a book as easy to find as a webpage and enhancing the user's ability to access and read books;
- Providing an opportunity for authors and publishers to make their books available.

It has two sources:

- Partner program: Publishers and authors transmit the contents of the books for the integration in GBS;
- Library project: GBS has scanned the collections of partner libraries.

Thus far Google has scanned several million of books. The ultimate aim is to include all book titles from all public and academic libraries all over the world. For books protected by copyright, search results are limited to meta-data and selected (random) text passages. Books out-of-copyright may be read online in full length or may be downloaded. To the best of our knowledge, cited references are not a part of meta-data. But GBS books appear as targets in Google Scholar.

### 3.5 *European institutional repositories*

Repositories are electronic archives of scientific-scholarly documents. In principle they are Open Access (OA) archives, freely accessible on the Internet – though, for copy right reasons, there may be limiting conditions. The bibliographic instruments tied to these repositories are utilitarian: they serve no higher bibliographic aim, but serve, as portals, to inform users about, and give them access to the documents in the database. Therefore the title description and subject indexing are sometimes poorly standardized.

Two types of repositories can be distinguished. The first is the *institutional* repository, which is accessible on the Internet, and designed to promote the research-related output of scholars from a particular institution. A second type of repository, normally also driven by an academic institution, is that which functions as an international OA e-publishing forum in a particular scientific area or *discipline*. Examples of the second type are ArXiv (science) and PubMed (biomedicine) and CogPrints (cognitive sciences).

With respect to *institutional* repositories, a large part of their content depends on local digitizing programs and depositing mandates, which encourage scholars to deposit their work on a regular basis. Institutional repositories incorporate the articles of 'their' researchers published in commercial e-journals as well as books published with commercial publishers. Since commercial publishers still have different allowance policies in this regard, the content and growth of institutional repositories has been, until recently, often erratic.

Examples:

- ArXiv (science); <http://arXiv.org>  
 - PubMed en BioMed (biomedicine); <http://pubmedcentral.nih.gov>,  
<http://gopubmed.com>, and <http://www.biomedcentral.com>  
 - CogPrints; <http://cogprints.org/>  
 - RePEc (economics); <http://repec.org>  
 - CiteseerX (computer and information science); <http://citeseerx.ist.psu.edu>  
 - Social Science Research Network; <http://ssrn.com>  
 - HAL (Hyper Articles en Ligne; all fields, French); <http://hal.archives-ouvertes.fr>  
 - MIT DSpace (all fields); <http://dspace.mit.edu>  
 Example of collectors/aggregators and meta-repositories:  
 - (all fields, Dutch) [www.narcis.info](http://www.narcis.info)  
 For a ranking of repositories, see <http://repositories.webometrics.info>.  
 For more information on the Open Archives Initiative (OAI), see  
<http://openarchives.org>.

Open Access repositories have a citation analytic potential. This is illustrated in the Open Citation (OpCit) project: Reference linking and Citation Analysis for Open Archives (see <http://opcit.eprints.org> for more information). An experimental demonstration is <http://www.citebase.org>. It should be noted, however, that the current state and content of individual repositories hampers this development.

In the European context the DRIVER project plays a key role (Digital Repository Infrastructure Vision for European Research; <http://www.driver-repository.eu/>). DRIVER aims to establish an infrastructure of Digital Repositories within Europe, offering services to both researchers and the general public. It builds an infrastructure for the future knowledge of the European Research Area. DRIVER will deliver any form of scientific output, including scientific/technical reports, working papers, pre-prints, articles and original research data. They envision to establish the successful interoperation of both data network and knowledge repositories as integral parts of the E-infrastructure for research and education in Europe.

In 2006 Van der Graaf and Van Eijndhoven published a Driver Inventory study. The authors concluded that in 2006 about 230 European institutions had implemented a digital repository. On the basis of a questionnaire sent out to these institutions with a response rate of 46 per cent, they found that the repositories in the replying institutions cover 37 per cent of institutions' recent publication output. Thirty per cent of included materials covers the social sciences and humanities, and 18 per cent of materials is books /chapters.

**Table 3.2: Type of materials covered in 114 European institutional repositories (from: Van der Graaf and Van Eijndhoven, 2006)**

<i>Type</i>		<i>% Materials</i>
Textual research materials	Meta-data only	61 %
	Full texts	29 %
Non textual materials	Images, videos, music, primary data sets	5 %
Other	Learning materials, student papers	5 %

Table 3.2 shows that 90 per cent of included materials are textual (publications). For 61 per cent of the materials only bibliographic meta-data are included (especially publishing author(s), source, title).

### ***3.6 OAPEN - Open Access Publishing in European Networks***

OAPEN consists of a number of European university presses and universities, all scholarly presses predominantly active in social sciences and humanities and in book publishing: Amsterdam University Press, Georg-August Universität Göttingen, Museum Tusulanum Press, Manchester University Press, Presses Universitaires de Lyon, Firenze University Press, University of Amsterdam, and Leiden University. For more information the reader is referred to <http://www.oapen.org/>.

These partners have developed a joint proposal in the category "Targeted Projects" in the "e Content-Plus Programme" of the European Commission, aiming to "develop and implement an OA publication model for academic books in the Humanities and Social Sciences" ([http://www.oapen.org/about\\_OAPEN.asp](http://www.oapen.org/about_OAPEN.asp)). At the same time, it aims to improve quantity, visibility and usability of high-quality OA (Open Access) content. One of the objectives is the creation of an online library dedicated to SSH that will include also content from other publishers in SSH. The project makes use of the DRIVER infrastructure (see Section 3.5).

## 4 Research assessment in social sciences and humanities in Spain

### 4.1 Introduction

This study explores the information sources for research evaluation in the social sciences and the humanities (SSH) in Spain, the main institutions and the use of indicators, specially the publication based indicators. In contrast with the situation in other areas of knowledge, social sciences and humanities lack internationally accepted quantitative criteria for research evaluation that fit the reality of this research; and this lack of consensus is leading to different levels of requirements among quite similar subfields. Spanish research evaluation institutions, aware of this, are promoting different initiatives with the objective of establishing quality criteria for the evaluation of research in humanities and social sciences.

The analysis starts by introducing the most important features of research evaluation common to all fields in Spain. And subsequently, we will go over the criteria for the evaluation of research performance in SSH, used by the different Spanish institutions in charge of research evaluation, focusing specifically on the use of publication based indicators.

### 4.2 Spanish Research Evaluation System (RES)

In Spain, research evaluation started to be considered a priority for Science & Technology policy management in the mid-80s and it was in those years that the first evaluation structures were institutionalized in the Spanish public research system (RES).

The Spanish research evaluation system is mainly characterized by three distinguishing features: First, the Spanish political decentralization is leading to an increasing pluralism in terms of evaluation practices and funding models (also sources), which is, in turn, reducing the ability of the national Research & Development (R&D) authorities to steer the system as a whole. Second, the focus of the Spanish RES is directed more towards individuals and research groups than towards organizations, whose evaluation is only marginally connected with research funding. The third characteristic refers to the Spanish research funding system, which has been structuring the funding allocation decisions mainly around incremental line item budgeting ex ante or project assessments until 2006, when the ex post evaluation of research activity, based on the accomplishment of programmatic goals combined with performance indicators, started replacing the traditional procedure<sup>1</sup>.

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<sup>1</sup> Cruz-Castro, L. & Sanz-Menéndez, L. Research Evaluation in Transition: Individual versus Organizational Sociology of Science Yearbook 2007 <http://www.iesam.csic.es/doctrab2/dt-0612.pdf>

### ***Research Institutions***

Research in Spain is being carried out mainly at universities and in the CSIC (Spanish National Research Council) the largest public research organization. But neither the research strategies of universities nor those of the CSIC have the impact on research attained by the funding bodies. The Spanish government conducts and sets research priorities through the funding of research projects, and it is this context of project-based targeted research which generally explains the allocation of fund based research evaluation in Spain.

### ***Research evaluation procedures***

Despite the decentralization of the research evaluation system, the evaluation practices are quite similar in the different regions of Spain, due mainly to the spreading of the national protocols throughout the regions. These procedures are all essentially focused in a peer- review project-based funding system aimed to guarantee the selection of the most competitive projects.

A priority of the National R&D plans for the arrangements of the management of the national research system has been the establishment of institutions in charge of the evaluation of research in all scientific fields. The evaluation standards tend to converge in the different areas, nevertheless there is some diversity of criteria across disciplines and scientific domains.

### ***Institutions for research evaluation***

Research evaluation of individuals and research groups for Positions, Projects and Pay.

- ANECA: Positions. Ex post research performance evaluation of lecturers (for recruitment procedures)
- ANEP: Projects. Ex ante project assessments and ex post research performance evaluation of researchers (for project selection and funding)
- CNEAI: Pay. Ex post research performance evaluation of tenured researchers (for salary increases).

### **4.3 ANECA<sup>2</sup>**

The National Agency for Quality Assessment and Accreditation (ANECA) was set up as a public trust in 2002. The ultimate goal of the Trust is to contribute to the improvement in quality of the higher education system through the assessment, certification and accreditation of university degrees, programmes, teaching staff and institutions; and the promotion of research in the universities.

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<sup>2</sup> <http://www.aneca.es>

The objective of the ANECA 2010 strategic plan horizon is the establishment of a management quality system, based on the European Standards and Guidelines for Quality Assurance in the European Higher Education Area<sup>3</sup>, rated using objective indicators.

This section will only concentrate on the research assessment of teaching staff and specifically on the ANECA research evaluation criteria, in particular in the SSH fields. The research evaluation activities carried out by ANECA are mostly associated with the official competitive evaluation required for university lecturers and senior lecturers, named accreditation and habilitation respectively. Research performance together with teaching experience is evaluated by ANECA prior to recruitment as this is a requirement for hiring by universities, public or state; and to qualify to sit for civil service exams or become a full professor.

### ***Academic Staff CV Research Evaluation Criteria***

The ANECA standards are based on internationally recognized standards such as The Personnel Evaluation Standards established by The Joint Committee of Standards for Educational Evaluation. The evaluation criteria are in general the same in each area, although the weight may vary between fields according to the different evaluating committees. The criteria depend on the area's specific features, for instance different publication types such as articles, books or book chapters may receive different weight and be measured separately or jointly; or the number of signing authors may be considered adequate or not, depending on the characteristics of the discipline. Research performance weighs 60 %. Articles in journals included in the Thomson Scientific databases, in the Philosopher's Index, or in the Répertoire Bibliographique de Louvain or similar, depending on the different areas, are primarily valued, taking into consideration their positions in the impact rankings.

The actual citation of articles must also be taken into account, specifying the source databases. When a discipline or specialty is not represented in these indexes, the committee may use other indexes which will have to be made public. In general, when journals are not included in these international databases they must fulfill similar quality requirements, although requirements may vary depending on the area. The number of required publications is approximate, and varies depending on the field and the level of the teaching position. In this section we will refer to the merits required for a postdoctoral non-civil teaching position, given that the relative proportions are reasonably constant at each level.

***In Social Sciences and Law*** articles weight 30% and are primarily valued: Thomson Scientific journals, Econlit, Latindex or similar. In the case that the database DICE<sup>4</sup> is used as a quality reference the main descriptors must be given.

***In Humanidades*** articles weight 26% and are primarily valued: Thomson Scientific journals, FRANCIS, International Bibliography of the Social Sciences, Bibliography of the History of Arts (RLG), Historical Abstracts, International Medieval

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<sup>3</sup> Standards drawn by the European Association for Quality Assurance in Higher Education (ENQA)

<sup>4</sup> DICE (Difusión y Calidad Editorial de las Revistas Españolas de Humanidades y Ciencias Sociales y Jurídicas) <http://dice.cindoc.csic.es>

Bibliography, Index Islamicus, RILMS, Abstracts of Music Literature, Philosopher's Index, Répertoire Bibliographique, International Bibliography of Periodical Literature in Humanities and Social Sciences (IBZ), Bibliographie Linguistique/Linguistic Bibliography (BL), Library and Information Science Abstracts and DICE.

Books and book chapters weight 12 % in Social Sciences and 16 % in Humanities. The prestige of the citation, publisher, editors, collection, reviews and length of the works or translations into other languages will be considered. Depending on the category of the teaching position different types of publications may or may not be considered as monographs, such as translations or revisions, critical reviews.

The rating, however, is not inflexible; the weight of each block may fluctuate depending on the scientific areas. For instance creative works may have greater value in some disciplines than in others, and may be considered in different sections. The evaluation criteria are quite similar, what changes is the weight, even in the different subsections of a block. Nevertheless, what is common to all disciplines is the prevalence of the first block of the seven in which research performance is structured for evaluation, the significant weight of publications.

**Table 1: Academic Staff CV Research Evaluation Criteria**

ANECA: Positions (Assistant Professor Non-tenured)	Academic Staff CV Research Evaluation Criteria								
	RESEARCH 60 %							TEACHING 30 %	OTHER 10 %
	ARTICLES	BOOKS; BOOK CHAPTERS	PROJECTS	TECHNOLOGY TRANSFER	CONFERENCE CONTRIBUTION	SUPERVISED PHD'S	OTHER	-	-
Social Sciences and Law	30	12	5	2	5	4	2	-	-
Humanities	26	16	5	2	5	4	2	-	-
Experimental Sciences and Health Sciences	35	7	7	4	2	4	1	-	-
Technical Education	32	3	12	6	2	4	1	-	-
Positive Evaluation = 55	50								5

**Table 2: Research and publishing requirements according to the level of the academic position**

ANECA: Positions	Academic Staff CV Research Evaluation Criteria								
	RESEARCH			TEACHING			OTHER		
	L	AP	FP	L	AP	FP	L	AP	FP
	60%	60 %	55%	35 %	30 %	35%	5 %	10 %	10 %
	No. Articles			-			-		
Social Sciences and Law	2	3	16	-			-		
Humanities	5	10	30	-			-		
Experimental Sciences and Health Sciences	6	12	40	-			-		
Positive Evaluation: AP = 55%	50%						5%		
FP = 80%	55%			20%			5%		

Non-Tenured Lecturer (L)  
 Non-Tenured Assistant Professor (AP)  
 Full Professor (FP)<sup>5</sup>

#### 4.4 ANEP<sup>6</sup>

ANEP (the Spanish National Evaluation and Foresight Agency) created in 1986 is currently a unit of the Ministry of Science and Innovation. The main functions assigned to the ANEP are the scientific and technical evaluation of research units, teams and proposals put forward for participation in the National Plan's programs and projects, and the monitoring of their results. However, ANEP does not control the final approval of the projects.

The ANEP comprises 27 thematic areas, four of which are related to SSH, based on the specializations recognized by international bodies, following UNESCO criteria. Each of these areas is headed by a coordination team composed of assistant coordinators who select the most appropriate experts for the evaluation of each research project. Evaluation is based on an anonymous peer review system and the evaluation criteria for a research project are mainly focused on the scientific track record of the head researcher and the research team, as well as on the evaluation of the obtained results in previous projects.

ANEP, in collaboration with the Spanish Foundation for Science and Technology (FECYT), have conducted studies to identify and review the evaluation criteria used to evaluate the different areas. As a continuation of the FECYT initiative in 2004-2005 with the White Book on *Research in the Humanities*, a work group was constituted in 2006 with the objective of establishing quality criteria for the evaluation

<sup>5</sup> There is no research merits evaluation in the case of having achieved 4 CNEAI 'sexenios', each one rated 15 points out of 100.

<sup>6</sup> <http://ciencia.micinn.fecyt.es/ciencia/jsp/plantilla.jsp?area=anep&id=22>

of Humanities research and in 2007 for the Social Sciences. Publications weigh 65 % of the curricula vitae. Table 3 shows the publication types which are mainly considered in SSH in order of importance.

**Table 3: Researchers' CVs**

<b>ANEP = Projects</b>	<b>Researchers' CVs</b>							
Humanities	Publications 65%						Knowledge Transfer 25 %	Research Activity 10 %
	Books and book chapters	International Articles	National Articles (ANEP journals)	Articles in conference proceedings	Session conferences	Bibliographies Catalogs Databases	–	–
Social Sciences	Publications						Doctorate programmes	Group & Projects
	Articles in Thomson Scientific	Articles in Indexes similar to Thomson Scientific		Books	Book chapters		–	–

### *ANEP classification of the Spanish scientific journals in the Humanities*

The list of criteria for classifying Spanish scientific journals in the Humanities is primarily based on editorial and scientific management quality and on the journals' dissemination in international databases. Journals may be classified in four categories with cumulative requirements (C, B, A, A+). Periodical revision of the journal categorization is suggested as necessary.

In some disciplines among the SSH area, citation indicators and peer review evaluations are not always enough to assess the potential of an individual researcher or a research group. For recent publications and subfields with no tradition in research evaluation, expert panels are recommended.

## 4.5 CNEAI<sup>7</sup>

The National Commission for the Evaluation of Research Activity (CNEAI) was created in the late eighties with the main objective of evaluating the research activity of university and CSIC tenured researchers. In 1989, in order to promote research, a voluntary, six-yearly performance evaluation of researchers was established with the award of salary increases as incentives.

The CNEAI classification comprises 11 fields from which 4 belong to the SSH area: *Social Sciences, Behavioral Science; Law; Art and History and Philosophy, Philology and Linguistics.*

The CNEAI considers prior quality criteria for publications, their presence in the prestigious international indexes, whether multidisciplinary or specific to each area,

<sup>7</sup> <http://ciencia.micinn.fecyt.es/ciencia/jsp/plantilla.jsp?area=cneai&id=501>

and their expected impact. The difficulty is in determining the quality of publications when they are not present in these international indexes, nor in the national ones. In this case they contemplate the possibility of presenting the number of actual citations and recognition gained by their work to the evaluating committee.

General requirements for positive evaluation to all fields:

- a) Publications must provide true progress in knowledge or methodological innovation
- b) Direct researcher participation in the process leading to the findings
- c) Minimum of 5 publications

The quality criteria of the CNEAI list are drawn from the acceptance requirements for publication established by the international indexes, requirements which would vary depending on the specific area of knowledge. In SSH, in general, analytic and comparative studies are more highly rated than descriptive works, and a high number of contributing authors may reduce the over-all rating.

**Table 4: Evaluation criteria specific to each area<sup>8</sup>**

CNEAI = Pay	Book	Articles in Thomson Scientific	Articles in national databases (CNEAI quality criteria)	Articles in international databases (CNEAI quality criteria)	Book chapters	Article in Conference Proceedings	award-winning piece of work	monographic exposition
Social Sciences and Behavioral Sciences	or 1	or 2	or 3	or 3	–	–	–	–
Art and History	or 1	or 2		or 2	or 1 + 1	–	or 1	or 1
Philosophy, Philology and Linguistics	or 1	or 2		or 2	or 1 + 1		–	–
				or 1 + 1				
Maths & Physics; Chemistry; Biology;		3						
Health Sciences		2						

For a positive evaluation five publications must satisfy one of the above mentioned criteria and at least one of the five publications must be one of the different options showed in table 4 depending on the areas.

## 4.6 Conclusions

Different scientific activities lead to different types of publication. It is necessary to distinguish between the different publication types in order to evaluate properly and it is important to agree on standard measures to evaluate SSH, which is a difficult task, given the subjective nature of the disciplines in these fields. The current evaluation

<sup>8</sup> RESOLUCIÓN de 11 de noviembre de 2008, de la Presidencia de la Comisión Nacional Evaluadora de la Actividad Investigadora, por la que se establecen los criterios específicos en cada uno de los campos de evaluación. <http://ciencia.micinn.fecyt.es/ciencia/jsp/plantilla.jsp?area=cneai&id=551>

systems are considering mainly papers in journals and as a result of this great part of the research output in SSH is being ignored. Another difficulty is the disagreement on evaluating criteria, “different evaluation bodies should apply the same criteria in order to have a solid and unique system for evaluating publications”<sup>9</sup>.

In Spain there have been some initiatives as the above mentioned carried out by the different research evaluation institutions in order to explore and evaluate the distinctive features of the research performance in SSH. One of the most important works is the joint project of ANECA and the former CINDOC, currently IEDCYT (Institute of Science and Technology Documentary Studies), for the establishment and supervision of a journal database covering the SSH, DICE. The ANECA-IEDCYT experts in SSH are currently evaluating the DICE database and analyzing possibilities for the creation of new indexes based on specific scientific quality criteria for these fields, as a further step relative to the previous project with the database DICE. The analysis is related to the viability of creating a weighted classification of non-internationalized journals, for which there are no indexes with quality relative indicators, and to catalog the main scientific production diffusion media in SSH.

Other platforms developed by Spanish institutions or research group are the database IN-RECS<sup>10</sup>; RESH also including Spanish journals in Social Sciences and Humanities<sup>11</sup>; Humanindex<sup>12</sup>; or MIAR, an informative tool to evaluate the diffusion of humanities and social sciences journals which provides bibliographic information on each journal and can generate rankings of publications using a diffusion indicator<sup>13</sup>.

Recently it has been created in Spain the *SCImago Journal & Country Rank (SJR)*<sup>14</sup>, a portal publicly available which includes journals and country scientific indicators developed from the information contained in the *Scopus* database. This is an important tool for the evaluation of the SSH because it enables users to evaluate research performance in these disciplines per journal and also per country. Different studies<sup>15</sup> have revealed the Scopus database in comparison to the other international multidisciplinary index the Web of Science to show greater dispersion among publishers' countries, to include more journals in non-English languages and to prove a more nationally oriented perspective which is essential in the evaluation of SSH.

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<sup>9</sup> Elea Giménez Toledo. Evaluation systems in the Humanities: the case of Spain. Evaluation in the Humanities: Towards a common European policy Bologna , December 12-13 2008, Bologna

<sup>10</sup> <http://ec3.ugr.es/in-recs/>

<sup>11</sup> <http://resh.cindoc.csic.es/index.php>

<sup>12</sup> <http://www.humanindex.unam.mx/humanindex/frm.home.php>

<sup>13</sup> <http://bd.ub.es/miar>

<sup>14</sup> <http://www.scimagojr.com/>

<sup>15</sup> López-Illescas C, Moya-Anegón F, Moed HF. Comparing bibliometric rankings derived from the Web of Science and Scopus: The effect of poorly cited journals in oncology. *Journal of Information Science*. 2009, 35(2), 244-256.

## **5 Capturing non-publication output in national research evaluation exercises**

### ***5.1 Introduction***

In evaluations of national excellence in research, it is important to consider categorizations and databases on other types of outputs than publications in the Social Sciences and Humanities (SSH). For instance, in the Performing Arts, a performance might constitute such an output.

As a start, we attempt to describe how recent large national research evaluation exercises in the United Kingdom and in Australia as well as one additional exercise have dealt with these non-published output forms. To differentiate these non-publication output forms from publications that have not (yet) been formally published (such as a journal article that is in press), that are kept out of the public domain (such as a confidential report) or from findings that for some reason have not been described, the former will be designated here as ‘non-publication output’.

Several non-publication indicators of research performance do not constitute research output. Both research income and esteem indicators are found among indicators of research performance. Although research income from research proposals may reflect fund-raising capabilities of research groups, it is intended to provide means for research which, if successful, might result in research output. Thus, this form of research income is an indicator of input or throughput rather than an output indicator, and it will not be discussed here.

Esteem indicators reflect social and / or scholarly forms of recognition, presumably, in the context of research evaluation exercises, at least partly in relation to past research performance. However, esteem is not an output, but rather an appreciation of outcomes. As such, esteem indicators are not discussed here. Nevertheless, in some cases esteem indicators refer indirectly to non-publication output and then it may be worthwhile to take a closer look.

### ***5.2 Australia: the ERA initiative***

In addition to publication output, the 2009 Excellence in Research for Australia (ERA) Initiative takes non-publication outputs into account. While the former are evaluated over a six-year period, a more restricted period of three years is used for the latter (ERA Indicator Principles, December 2008, p. 3). In future rounds of ERA, it is anticipated that a greater number of quantitative indicators may be used ‘once they have been further developed, tested and shown to be valid and robust’ (ERA Indicator Principles, December 2008, p. 1). To this end, an Indicators Development Group (IDG) has been formed in August 2008, with a Creative Arts subcommittee and a Humanities subcommittee. As far as I am aware, reports by the sub-committees have not been published.

The ERA takes into account publications (four major types: ‘book, chapter, journal article, refereed conference publications’), income, esteem, and ‘applied [research]’. Below are listed what the ERA considers as the non-publication types (ERA Indicator Descriptors, December 2008). I have bracketed ‘[]’ the categories that seem less relevant for SSH or that do not constitute research output.

#### *Applied research*

- Registered designs
- [Research commercialization income]
- [Standard patents sealed]
- [Plant breeders’ rights]

#### *Esteem*

- *Curatorial role* (head curator, membership of curatorial board) of a prestigious event (‘characterized by a highly competitive international curatorial / judging / selection process and the highest professional standards’; for example: a prestigious international biennale such as the 2006 Venice Biennale or the 2007 International Film Festival). ‘These events and works have a highly significant impact on practice in the field, as evidenced through professional and/or scholarly publications, performances, recordings, broadcasts, forums and settings’
- Prestigious *awards and prizes* (national and international)

#### *Comments*

Research commercialization income might also include income from intellectual property rights and designs; it is not clear whether income related to published books, movies, performances, creative products, and so on are included. As such, it might constitute a measure of societal impact.

Under esteem, two publication-linked types have been included: editorial roles (as these may not give rise to direct publication), as well as contribution to a prestigious work of reference. The latter type might be of importance to SSH, as it might be extended to include highly thought of dictionaries and other prestigious reference works of a non-directly research-related nature.

Under curatorial role of a prestigious event, instances are given which might be used in the classification of important SSH non-publication output, such as works that are contributed to the Venice Biennale (these now include dance, art and cinema) or similar events. Similarly, a creative performance, a recording, a work of art, or a movie might be included. If the curatorial role is thought of as highly prestigious, so might be the products or events that are judged.

Concerning applied research, patents will usually not be relevant for SSH, but exceptions occur (e.g., translation devices); patents are considered here a form of publication. Plant breeder’s rights give the owner exclusive commercial rights over a new variety of plant. As such, it is not relevant for SSH. Registered designs are only included in ERA for ‘cases where there is a clear link between the registered design and the related research’. Thus, it seems that only that share of the non-publication-output will be considered in ERA that is clearly linked to related research of the

scholars and scientists. The formulation ‘a clear link between the registered design and the related research’ presupposes a judgment call that provides room for interpretation and debate.

### 5.3 *The UK: the RAE 2008*

The Research Assessment Exercise (RAE) 2008 takes non-publication research output into account. It has deliberately defined research output broadly (Panel O, 2006, p. 10, 28). For Panel O (comprising Art and Design; History of Art, Architecture and Design; Drama, Dance and Performing Arts; Communication, Cultural and Media Studies; and Music), “research outputs may include, but are not limited to: new materials, devices, images, products and buildings; intellectual property, whether in patents or other forms; performances, exhibits or events; work published in non-print media” (Panel O, 2006, p. 10, 28).

Concerning submissions, “any form of publicly available, assessable output embodying research as defined for the RAE may be submitted, as may confidential outputs that are not publicly available” (e.g., output produced for contract research including commercially sensitive research reports and reports for government agencies that are not in the public domain). Particularly where research outputs are not in a conventional format (including non-publication research output), sub-panels may ask for ‘brief supplementary material describing the research content and significance of certain works’ (Panel O, 2006, p. 10, 31)

RAE submissions must be verifiable and their contents should relate to research. In case of non-text output, evidence of their dissemination in the public domain is required as well as evidence of their research content (RAE 2008: Guidance on research outputs, sections 9-10). Concerning ‘transient’ output (such as performances or exhibitions) verifiable evidence must be provided, if requested. This could be a dated exhibition catalogue or performance program. Evidence of the research output could include an electronic record (DVD, video, sound or other recording) or photographic record, or other documentary evidence ‘on which the sub-panel can make an informed assessment of its research content and quality’ (RAE 2008: Guidance on research outputs, section 11).

Moreover, all forms of research output are to be assessed on an equal basis. It is explicitly stated that “(s)ub-panels will neither rank outputs, nor regard any particular form of output as of greater or lesser quality than another per se” (*italics in original*) (Panel O, 2006, p. 10, 32). The use of journal impact factors as a proxy measure for assessing quality is explicitly forbidden (Panel O, 2006, p. 10, 32); for non-publication output, such proxy measures are not mentioned explicitly.

Output was to be judged in terms of originality, significance and rigour as world-leading (4\*), intellectually excellent (3\*), recognized internationally (2\*), recognized nationally (1\*) or unclassified (below the standard of nationally recognized work or work that does not meet the published definition of research for the purposes of the RAE assessment). Here, the terms ‘world-leading’, ‘internationally’ and ‘nationally’ do not refer to nature or geographical scope of particular subjects, nor to the place of dissemination or the locus of research, but these terms are used as quality standards. It

is left completely to the judges to determine the classification of a research product, as there are no concrete reference points or benchmarks.

Specifically excluded is the development of teaching materials that do not embody original research. For higher education pedagogic research, research is limited to that which enhances theoretical and/or conceptual understanding of teaching and learning, and that is published in the literature.

However, scholarship is defined as ‘the creation, development and maintenance of subjects and disciplines, in forms such as dictionaries, scholarly editions, catalogues and contributions to major research databases’ (Annex 3 RAE 2008), and this is included. Here, research databases form a non-publication output. Also, explicitly included are ‘the invention and generation of ideas, images, performances, artefacts including design and construction’ (Annex 3 RAE 2008).

In English Language and Literature (UOA 57), possible non-publication output concerns databases, but also teaching materials ‘where these contain a significant research element’. [Published output does include poems, short stories, plays, shorter translations, pamphlets.] Work in performance arts must be accessible, for instance in audio or video form (UOA 57, section 22).

Drama, dance, and performing arts (UOA 65) mention digital and broadcast media; documentation and reconstruction; films, videos and other types of media representation; performances and other types of live presentation; scenography; digital and virtual performance; the creation of archival or specialist collections to support the research infrastructure (UOA 65, 8). Elsewhere, research output comprises an artifact, curation; digital format; installation; performance or event; screening; tape; video.

For non-standard output, researchers in English Language and Literature are requested to indicate the relation of the research product to the key criteria of originality, significance and rigour in a factual statement of no more than 200 words. In Drama, Dance and Performing Arts, a descriptive comment of up to 300 words is recommended to make evident the research significance and research imperatives of a non-publication output. “The statement might include a brief description of the project and its stage of development; a rationale outlining questions addressed; a summary of approaches/strategies undertaken in the work; a digest of further evidence (if any)”. The further evidence refers to a portfolio, an evidence box of materials in either digital and/or physical form deemed to assist the judges, with an emphasis upon making evident the research and/or scholarly dimensions of the work (UOA 65, section 13c (2006)).

The general RAE 2008 requirements for electronic and/or physical provision of research output further include composition (covering both the score and performance), design (both registered and unregistered), and devices and products.

Recently, outcomes of RAE 2008 have been published. The sub-panel for Drama, Dance and Performing Arts noted that a large number of outputs were print outputs, although practice as research (PaR) represents ‘a considerable proportion’ of the output. Many outputs were in digital format. Intercultural, cross-cultural and/or

transnational contexts were mentioned, sometimes occurring in international locations. Increasingly, there were collaborations and links with creative industries at local, regional, national and international levels. Concerning quality, the monograph 'is still an important marker within the disciplines alongside book chapters and journal articles' (section 12 RAE2008 UOA 65 subject overview report). In dance research, PaR included live and virtual choreography. In Drama, Dance and Performing Arts PaR, 'the best research outcomes were achieved by practitioner-researchers testing their findings in national and international contexts' (Section 15). Rather than the actual dissemination of PaR which appeared to be limited due to practical difficulties, the potential for wider dissemination was credited by the subpanel. The subpanel notes that a proportion of PaR did not have sufficiently established research credentials, frequently failing 'satisfactorily to articulate any research content or imperatives'. According to the subpanel, PaR requires its own version of scholarly apparatus (Section 16).

### *Comments*

The UK RAE 2008 offers an extensive description of the types of non-publication output that might figure in assessments of research output in the humanities and some social sciences. Its esteem indicators do not refer to specific instances, and therefore were not discussed. However, the RAE 2008 supporting material is not very helpful in outlining concrete standards or reference values that might assist in research assessments. In essence, this is left to the judges.

RAE 2008 outcomes seem to rely for an important part on written publications such as monographs, book chapters and journal articles, even for the subpanel Drama, Dance and Performing Arts. A frequently encountered problem with Practice as Research was that researchers failed to link submitted PaR output satisfactorily to research. Here, text (scholarly apparatus) was deemed essential. This means that it will not be sufficient to establish a database containing just non-publication output; it will often (if not always) be necessary to include supportive material concerning research credentials, research content and research imperatives.

### *5.4 Other national assessments*

A national assessment of Modern Language and Literature Research in the Netherlands classified non-publication output as 'activities' (Nederhof & Erlings, 1993). These could be either of a scholarly nature or directed at external knowledge transfer. Activities directed at external knowledge transfer included contributions to radio or television programs (split in interviews and non-interview contributions).

This assessment did consider scholarly awards, but these did not refer to non-publication output, as far as this could be ascertained.

### *5.5 Developing yardsticks for non-publication output*

From the above, it becomes clear that formal yardsticks for scholarly non-publication output are largely missing in the assessments that were reviewed. Especially the Australian and UK assessments are known to be relatively advanced and developing.

Although in all disciplines publication output is not uncommon, in parts of several disciplines, non-publication output is of some importance.

First, it is important to distinguish the public at which an output is directed. Especially in SSH, researchers address not only (as in most science fields) the international community of scholars and / or scientists, but also a national or regional public of scholars and / or scientists, or the public in general. Usually, different media and output forms are used when addressing a particular public, such as a national journal for national scholars and scientists and a non-scholarly medium (such as a periodical) for the general public.

This classification can also be applied for non-publication output. A film or video might be an instrument in a psychology experiment that will be published in a journal whose articles are cited internationally; similar, such an output can be directed at a national scholarly public, or at the general public. In the latter case, measures such as the size and diversity of the public might be relevant, as well as the status of the social context in which the output is presented.

The Australian ERA initiative includes under its esteem indicators curatorial roles for prestigious events. If a curatorial role for such an event reflects esteem for researchers, the contributions to such events (provided that these are refereed in some way) might also be of some importance. If a curatorial role at Venice Biennale is considered a reflection of esteem, a contribution to such a prestigious event might also be of considerable value. As argued above, the public at which the event is directed should also be taken into consideration. At present, there is no fixed list of such prestigious events, but this could be developed.

For performances, the outlets might be ranked according to prestige. A performance or showing at the New York Madison Square Garden or the Sydney Opera House might be of greater weight than one at the local pub. Note that in theory the latter performance might be of greater quality than the former. Furthermore, one might look at reviews of the performance or showing. However, these will tend to focus mostly on the value of the performance for the general public (or that portion that might visit such events), and not necessarily on the scholarly value as related to the research of the scholar or scientist.

Similarly, media might be ranked according to prestige. A BBC showing might be of greater prestige than a local exposure. For modern art works (including performances), a contribution to the five-yearly *documenta* (Kassel, Germany) might be more prestigious than a local exhibit.

RAE 2008 outcomes indicate that it will not be sufficient to establish a database containing just non-publication output; it will often (if not always) be necessary to include supportive material concerning research credentials, research content and research imperatives.

## **6 Options for creating an inclusive database of outputs from SSH fields**

This chapter discusses a series of options for creating a comprehensive database of outputs in social sciences and humanities research.

7. Combine a number of existing European special SSH bibliographies.
8. Create a new database of SSH outputs from publishers' archives.
9. Stimulate further enhancement of SSH coverage of Web of Science and /or Scopus.
10. Stimulate further development of institutional repositories.
11. Stimulate creation and standardization of institutional research management systems.
12. Explore the potentialities and limitations of Google Scholar and Google Book Search

These options are discussed below in Sections 6.1 to 6.6. Finally, Section 6.7 presents concluding remarks and makes suggestions for future research.

### ***6.1 Combine existing special SSH bibliographies***

Section 3.2 analyzed a number of publication databases covering social sciences and humanities. As outlined in Section 2.5, these databases tend to include special bibliographies covering specific (sub-) disciplines. One option could be to examine the feasibility of combining these databases –or at least a substantial number of these– and create one comprehensive bibliographic database.

If one would aim at creating a comprehensive database of SSH outputs in this way, one would have to standardize database structures and data fields across databases. Within the family of CSA-Illumina databases this approach to standardization has been realized to a considerable extent, but many candidates for inclusion do not belong to this family. A crucial issue would also be to examine the selection criteria for including sources in the various databases, and to which extent standardization of these criteria could and should be achieved.

It would involve a major effort to standardize and de-duplicate all these databases. We feel unable to give a reliable estimate of the size of such efforts. Such an estimate could be obtained from a separate feasibility study involving the major database producers.

It has been noted in Section 3.2 that most of these databases do not contain cited references, and do not include data on institutional affiliations of publishing authors. Therefore, they cannot be used directly for bibliometric analyses of publication output, collaboration and citation impact at the level of authors or institutions. It is also important to emphasize that the current versions of these databases contain mainly journal articles. Books would still be underrepresented in the compound database.

The limitation to European special bibliographies is a problem in itself, since most international bibliographies, whether they are organizationally based in Europe or elsewhere, have a global scope. Hence, the exclusive use of Europe based databases is problematic: subject fields which are covered by databases of non-European origin will be badly represented in the combined database.

## ***6.2 Create a new database of SSH outputs from publishers' archives***

According to this option, one would create a database more or less 'from scratch', by collecting publication (and citation) data directly from the publishers. An excellent example of this approach is the plan of the Spanish Minister of Science and Education and the Spanish Research Council (CSIC) to create a citation index of Iberian research publications. This is a most interesting case as the plan has actually been approved, and the project is expected to start soon. For more information the reader is referred to [http://web.micinn.es/01\\_Portada/01-Ministerio/031Prensa/00@Prensa/230209.pdf](http://web.micinn.es/01_Portada/01-Ministerio/031Prensa/00@Prensa/230209.pdf).

The new database would not merely include journal articles, but also books. Moreover, it would have both a bibliographic and a bibliometric function. A major issue is how to establish quality criteria for inclusion of sources in the new database.

## ***6.3 Further enhance SSH coverage in Web of Science and Scopus***

As outlined in Section 3.3, Thomson Reuters' Web of Science (WoS) and Elsevier's Scopus recently expanded the coverage of SSH publications. Both producers are commercial enterprises operating in a common market. It is plausible to assume that they may be willing to further expand their SSH coverage if – and as long as – there is a market for it.

Following this line of reasoning, and taking into account the crucial importance of books in written scholarly communication in SSH fields, Thomson Reuters and Elsevier could be interested in further expanding the book coverage of their databases. This expansion could first of all involve the inclusion of complete bibliographic meta data on 'important' (e.g., highly cited) books, perhaps within the framework of a general quality improvement of the bibliographic description of cited publications (articles, book chapters and books) published outside the source journals of the index. But this expansion could also relate to the processing and inclusion of the cited reference lists in books.

A major advantage of WoS and Scopus is that they are comprehensive, multidisciplinary databases rather than specialized bibliographies. As a result, SSH (sub-)disciplines do not have to be delimited in advance. Equally important, the databases can be used to examine citation or semantic links between SSH fields on the one hand and the natural, technical and life sciences on the other. Finally, these indexes have their own, internal coverage monitor, based on citation links.

#### ***6.4 Stimulate further development of institutional repositories***

Section 3.5 described the current situation with regards to the creation of institutional repositories (IR's). On the one hand, it must be noted that an inventory study on European institutional repositories carried out by Van der Graaf and Van Eindhoven in 2006 showed that only a fraction of European higher education institutions (HEI) had created a repository – only some 25 per cent if one assumes that there are 1,000 research oriented HEI's across Europe – , and that those institutions that did have an IR deposited only some 37 per cent of their research output from a recent year – but this outcome is obtained from a questionnaire with a 45 % response rate.

Although the numbers for 2009 are probably higher than those for 2006, it is not unrealistic to assume that currently only some 10 per cent or so of the recent (1-5 year old) publication output of European HEI is included in institutional repositories. But nevertheless, the IR system provides in principle good opportunities of the creation of a comprehensive database of SSH research outputs, if institutions are further stimulated to deposit their output and thus increase the IR coverage.

Stimulating institutions to deposit their research outputs should not be merely be founded in the notion of Open Access, but also be linked to the need for HEI's and public research organizations to develop and use internal research management systems. These will be discussed further in Section 6.5.

A first step could focus on harvesting 'standard' bibliographic meta-data of deposited publications across repositories. A second step could aim at capturing cited references contained in the publications, by designing institutional deposit policies for the capture, in the institutions' repositories, of the reference lists of all of each institution's authors' deposited journal articles and published books. In this way, in the end a comprehensive journal article and book citation index can be created.

#### ***6.5 Stimulate creation of institutional research management systems***

Section 2.1 emphasized that the globalization of teaching and research, and the need for universities to compete with one another in an international market, increased the need for research policy officials, managers and the general public for 'objective' information about the institutions' performance. For instance, at the institutional and departmental level bibliometric indicators are used as tools in international benchmarking and in research evaluation, combining them with expert knowledge and/or peer ratings. And the European Commission launched the concept of a European Research Area, and underlined the need for public information systems on higher education institutions, including data on their research performance.

In view of these trends, institutional research management systems containing information on research carried out in an institution – including lists of publications made by its researchers – are becoming increasingly important. A typical example is the research information system METIS system in the Netherlands. Technically such a system can be linked to an institutional repository. As noted in Section 2.5, these

research management systems tend to be up-to-date, cover all document types, and make some useful, methodical categorizations.

Although at present such systems have not yet reached the levels of extensiveness and standardization needed to be used for bibliometric purposes, in view of their increasing importance their construction could be further stimulated and standardized, possibly within the framework of an initiative of the European Commission. Eventually they could be fully integrated with the system of institutional repositories

## **6.6 Explore the potentialities of Google Scholar and Book Search**

As outlined in Section 3.5, Google Scholar is a valuable database of scientific-scholarly literature, since it is the only database exploiting books as sources of citation links. But as a bibliometric tool it has certain limitations that have to be examined in more detail. The major one is perhaps that users have no full insight into which sources are actually covered. It is plausible to assume that Google Scholar harvests the institutional repositories mentioned in Section 6.4. Markland (2006) has conducted searches to see how easily items could be retrieved from a repository using both Google and Google Scholar (varying searches using phrase/keyword from the title and full title) and found that Google retrieved a higher percentage of items overall, but Google Scholar retrieved a higher percentage of items exclusively from the repositories (p. 225). Regarding the accuracy of citation links, a recurring issue was the exact status of the document (i.e., preprint, latest version or author's final version). The degree of stability over time is also an issue of concern, and there is as of yet no categorization of all sources into (sub-) disciplines. Nevertheless, Google Scholar has an enormous potential as a source for bibliometric analysis.

This is also true for Google Book Search. It is a most interesting project, aimed at eventually creating a 'database' of all book titles available in academic and public libraries. To the best of our knowledge cited references in processed book titles are not a part of meta-data, but in principle it is technically feasible to extract cited references. GBS books already appear as publications in Google Scholar. It would be possible to further integrate Google Scholar and Google Book Search and create a citation index of journal articles *and* books.

It would therefore be an option to build upon the exploratory studies of Google Scholar conducted thus far, and start up large scale projects aimed at further exploring the use of Google Scholar for bibliometric purposes, especially for the calculation of indicators of research performance in social sciences and humanities. At the same time, one should collect more information about Google's future plans, especially those related to further integrating Google Scholar and Google Book Search.

## **6.7 Concluding remarks**

The options described above are not mutually exclusive. In fact, we believe all developments highlighted above – except perhaps that described under the first option - will continue in the coming years: the creation in Spain of an Iberian database is expected to go on; Thomson Reuters and Elsevier will further enhance the coverage of

social sciences and humanities fields; Google will further enhance its products Scholar and Book Search and possibly integrate them; and institutional repositories and research management systems will further develop.

It is difficult to forecast the speed of these developments. Much depends upon the extent to which it will be possible to combine them in a way that is profitable for all stakeholders involved. In any case, it is clear that standardization and availability of linking and usage data become increasingly important, also within the context of the creation of a comprehensive database of SSH research outputs. Therefore, we finish this section with some notes on these issues.

Our starting-point is the idea of the unity and coherence of the bibliographic universe. This universe may be seen as a multilayered system of meta-data. The unification and standardization of those meta-data is not an end in itself, but a means to support the free flow of meta-data between databases and to enable the building of interfaces. In the past a large amount of rules and protocols have been created to bring about this unity: e.g. the concept of Universal Bibliographic Control (UBC), the International Standard of Bibliographic Description (ISBD), the Anglo-American Cataloguing Rules (AACR), MARC standards (MACHINE Readable Cataloguing), the Open Archive Initiative (OAI), and the Digital Object Identifier (DOI). Together they have prevented the bibliographic universe from falling apart by guaranteeing the data exchange between systems in large measure. Less successful, perhaps, has been the standardization in the field of classification and subject indexing, but even there we are not without comprehensive systems: e.g. the Library of Congress Classification, Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC), and Library of Congress Subject Headings (LCSH) – not to mention the special classification and indexing systems of individual disciplines.

Generated by web developments, new, interdependent developments have taken place that require adaptations and extensions of the meta-data building erected so far: first, the rise of e-publishing (both Open Access and commercial); second, the increased importance of linking between documents (citations, hyperlinks); and, third, the need for metrics and benchmarking. As far as the OA e-publishing is concerned, a beginning of standardization has been provided for by the OAI. So, the meta-data fields which up to now appear least regulated, are those related to linking (citations, hyperlinks) and usage (downloads, loans, sales) – precisely the fields that are central to bibliometric impact measurement. Consequently, the question should be asked if there are aspects in linking and usage which, to the benefit of bibliometric research, should be standardized; and, if so, initiatives could be taken to create and implement such standards, and to build interfaces retrieving linking and usage meta-data from different sources with the help of those standards.

On this standardization trajectory some problems may be foreseen. One of the most obvious is the fact that both public and private stake holders are involved, which, particularly concerning the exploitation of usage meta-data, may have competing interests. Former standardization operations in the field of basic bibliographic description, cataloguing, classification, and subject indexing, were less affected by this problem, since the leading part then was played by public (government) institutions, especially national and academic libraries and research organizations. Now, with linking and usage meta-data, the situation is certainly different.

Commercial publishers are nowadays the owners of the big citation indexes. Google, a mixture of public domain and commercial, and particularly Google Scholar, have invaded the territory of scientific information and communication, and are handling enormous amounts of both primary information and meta-data. Academic repositories are in large measure modeled on the public domain structures of the Internet, which has given universities less control than in the old days when they dealt with physical collections. As a result of all this, new meta-data standards must have a larger span of control, which will make it more difficult to develop them.

The reason why standardization might be welcome is that it might enhance the obtaining and processing of linking and usage meta-data. However, standardization is no guarantee in itself. At least as important is the availability of the metric data. Meta-data owners should be willing to release them for bibliometric study. Especially with the download and sales figures of commercial publishers there is much to be desired. Without knowing the download figures of commercial e-journal articles, the download figures of repositories, in as far as they copy these articles, will be largely worthless for bibliometric purposes, and vice versa. Unfortunately, this point is often missed by the proponents of OA-bibliometrics. Therefore, the availability of download figures for bibliometric ends (not only of the own institution, but preferably world-wide) should in the future become part of license negotiations between publishers and universities.

Also the availability of usage data from libraries is subject to many restrictions. Loan figures per book are not made public by libraries. Library holding figures are in principle obtainable from OPAC's, but the matching of book titles over different OPAC's is often problematic. So, even here much work remains to be done, if we want these usage and collection data to be part of bibliometric evaluation procedures.

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## **Annex A: Characteristics of selected SSH publication databases**

<b>Question/ aspect</b>	<b>FRANCIS</b>	<b><i>Bibliography of the History of Art (BHA)</i></b>	<b><i>CSA Linguistics &amp; Language Behavior Abstracts (LLBA)</i></b>	<b><i>MLA International Bibliography (MLA)</i></b>	<b><i>Philosophers Index</i></b>	<b><i>RILM Abstracts of Music Literature (RILM)</i></b>	<b><i>Applied Social Sciences Index and Abstracts (ASSIA)</i></b>
<b>Database producer</b>	Institut de l'Information Scientifique et Technique (INIST- CNRS)	AHIP/J. Paul Getty Trust & INIST/CNRS	Cambridge Scientific Abstracts (CSA)	The Modern Language Association of America (MLA)	Philosopher's Information Center (USA)	(Répertoire International de Littérature Musicale) RILM International Center (USA)	Cambridge Scientific Abstracts (CSA)
<b>Dates of coverage</b>	1984 - current	1973- current	1972-current	1926 - current	1940-current	1967 - current	1987 - current
<b>Which (sub)discipline s does it cover</b>	Humanities (62%) and social sciences (38%)	The BHA covers the current international literature on the history of art in Europe and the New World.	Covers the international literature in linguistics and related disciplines in the language sciences.	MLA covers modern languages, literatures, folklore, and linguistics from all over the world	Covers informative, author-written abstracts covering scholarly research in all areas of philosophy.	A comprehensive, ongoing guide to publications on music from all over the world.	Covering health, social services, psychology, sociology, economics, politics, race relations and education.
<b>Size: How many records does it contain as from the starting year?</b>	Over 1,773,957 records as of January 2009	Over 741,605 records as of October 2008	Over 418,200 records as of January 2009	Over 2,175,180 records as of January 2009	Over 416,551 records as of November 2008	Over 532,015 records as of November 2008	Over 441,302 records as of January 2009

<b>Question/ aspect</b>	<b>FRANCIS</b>	<b>Bibliography of the History of Art (BHA)</b>	<b>CSA Linguistics &amp; Language Behavior Abstracts (LLBA)</b>	<b>MLA International Bibliography (MLA)</b>	<b>Philosophers Index</b>	<b>RILM Abstracts of Music Literature (RILM)</b>	<b>Applied Social Sciences Index and Abstracts (ASSIA)</b>
<b>What type of sources does it cover (e.g., journals, books, proceedings volumes, grey literature)?</b>	includes coverage of journals, books, conference papers and other documents.	Analytic and collection: Conference report; monograph; Review; Review of a conference; Review of an exhibition. BHA indexes and abstracts 1,400 journals, books, conference proceedings, essays, exhibition catalogues, selected art dealers'	Abstracts of journal articles and citations to book reviews, abstracts of books, book chapters, dissertations, and conference papers. (Journal Article: 72% Book, Film, and Software Review: 15% Conference Paper: less than 1%	Book 10%, Book chapter 19%, Book collection 1%, Dissertation 6%, Journal Article 64% It also includes the MLA Directory of Periodicals database. Dictionaries, catalogs, bibliographies, indexes, and other reference works as	<ul style="list-style-type: none"> <li>• Journal Articles: 70%</li> <li>• Book Reviews: 11%</li> <li>• Contributions (Book Chapters): 10%</li> <li>• Books: 9%</li> </ul>	Articles, books, bibliographies, catalogues, dissertations, Festschriften, iconographies, critical commentaries to complete works, ethnographic recordings, conference proceedings	All ASSIA records are journal articles
<b>Does it contain all authors of a source publication?</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Does it contain the institutional affiliations of all publishing authors?</b>	The Author Affiliation field exists since 1997. Contains affiliations of all authors.	NO	Yes	No	NO	NO	No

<b>Question/ aspect</b>	<b>FRANCIS</b>	<b>Bibliography of the History of Art (BHA)</b>	<b>CSA Linguistics &amp; Language Behavior Abstracts (LLBA)</b>	<b>MLA International Bibliography (MLA)</b>	<b>Philosophers Index</b>	<b>RILM Abstracts of Music Literature (RILM)</b>	<b>Applied Social Sciences Index and Abstracts (ASSIA)</b>
<b>To which extent are author names and institutional affiliations standardized ?</b>	Not standardised (?) Author names will generally be indexed as shown in the original article.	NO. (Although generally author names are listed last name first, followed by first name or initials.)	NO	Not standardised (the database has a list with the names where you can check the spelling and choose)	NO	NO?	NO. Author names will generally be indexed as shown in the original article.
<b>Which categorization of documents into document types is used?</b>	journal article, book, conference meeting, report and thesis. Also book; serial; conference-meeting; thesis; report; map	Conference report; monograph; Review; Review of a conference; Review of an exhibition. books, conference proceedings, essays, doctoral dissertations and microform publications.	Journal Article Book, Film, and Software Review Conference Paper Dissertation Book Book Chapter	The options in the database for 'limit to' are: Books Book Articles Dissertation Abstracts Journal Articles Web Sites	Journal articles, books, book chapters and book reviews.	Articles, books, bibliographies, dissertations, Festschriften, iconographies, critical commentaries to complete works, ethnographic recordings, sound recordings, conference proceedings, electronic resources	All ASSIA records are journal articles and thus assigned the same Publication Type
<b>Does it contain cited references in source publications?</b>	No	No	No	No	NO	No	NO

<b>Question/ aspect</b>	<b>ECONLIT</b>	<b>International Bibliography of the Social Sciences (IBSS)</b>	<b>LIBRARY AND INFORMATION SCIENCE ABSTRACTS (LISA)</b>	<b>PsycINFO</b>	<b>Sociological Abstracts</b>	<b>Worldwide Political Science Abstracts (WPSA)</b>	<b>Historical Abstracts (HA)</b>
<b>Database producer</b>	American Economic Association	London School of Economics and Political Science (UK)	Cambridge Scientific Abstracts (CSA)(USA)	American Psychological Association (APA)	Cambridge Scientific Abstracts (CSA)	Cambridge Scientific Abstracts (CSA)(USA)	EBSCO
<b>Dates of coverage</b>	1969 - current	1951 - current	1969 - current	1800 - current	1952 - current	1975 - current	1955 - current
<b>Which (sub)disciplin es does it cover</b>	EconLit, indexes more than thirty years of economics literature from around the world.	The IBSS is a resource for social science and interdisciplinary research, with main focus on anthropology, economics, politics and sociology.	LISA covers librarianship, information science, online retrieval, publishing and information technology.	PsycINFO provides access to international literature in psychology and related disciplines.	Offers access to the international literature in sociology and related disciplines in the social and behavioral sciences.	Covers political science and its complementary fields, including international relations, law, and public administration / policy.	Historical Abstracts covers the history of the world (excluding the United States and Canada) from 1450 to the present
<b>Size: How many records does it contain as from the starting year?</b>	Over 935,690 records as of January 2009	Over 2,516,558 records as of January 2009	Over 313,909 records as of January 2009	Over 2,630,018 records as of January 2009	Over 907,694 records as of January 2009	Over 732,369 records as of January 2009	659,175 records as of April 2006

<b>Question/ aspect</b>	<b>ECONLIT</b>	<b>International Bibliography of the Social Sciences (IBSS)</b>	<b>LIBRARY AND INFORMATION SCIENCE ABSTRACTS (LISA)</b>	<b>PsycINFO</b>	<b>Sociological Abstracts</b>	<b>Worldwide Political Science Abstracts (WPSA)</b>	<b>Historical Abstracts (HA)</b>
<b>What type of sources does it cover (e.g., journals, books, proceedings volumes, grey literature)?</b>	Peer-Reviewed Journals, Conferences, Books, Book Reviews, Reports, Dissertations, and Other.	Books Books Chapters Journal Articles Reviews also includes research notes, responses and short essays.	Journal articles. journal article bibliography journal article book review journal article conference report journal article electronic only journal article literature review newspaper	These are the option for 'publication type' in the database: Book; Authored Book; Edited Book; Journal; Peer-Reviewed Journal; Non-Peer- Reviewed Journal:	Journal Article: 62% Book, Film, and Software Review: 26% Conference Paper: 7% Dissertation: 3% Book and Book Chapter: 2% Working paper: less than 1%	Journal Article: 85% Book, Film, and Software Review: 5% Dissertation: 1% Book and Book Chapter: 9%	Journal articles, collections of essays, such as conference proceedings and festschriften, book reviews from 13 major review journals, and dissertations from Dissertation Abstracts International.
<b>Does it contain all authors of a source publication?</b>	At most 3 authors	Yes	Yes	Yes	Yes	Yes,	Yes
<b>Does it contain the institutional affiliations of all publishing authors?</b>	Yes,	Yes	Yes, (as from 2006 and only for the first author)	Yes	Yes (but not for all authors, it looks like only for the first one)	Yes, but I don't know if it is for all authors or not.	No institutional affiliations

<b>Question/ aspect</b>	<b>ECONLIT</b>	<b>International Bibliography of the Social Sciences (IBSS)</b>	<b>LIBRARY AND INFORMATION SCIENCE ABSTRACTS (LISA)</b>	<b>PsycINFO</b>	<b>Sociological Abstracts</b>	<b>Worldwide Political Science Abstracts (WPSA)</b>	<b>Historical Abstracts (HA)</b>
<b>To which extent are author names and institutional affiliations standardized ?</b>	NO	NO. Author names will generally be indexed as shown in the original article.	No	No	NO	No	Author names as shown in the original publication
<b>Which categorization of documents into document types is used?</b>	<ul style="list-style-type: none"> <li>• book</li> <li>• book review</li> <li>• collective volume article</li> <li>• dissertation</li> <li>• journal article</li> <li>• working paper</li> </ul>	Book Chapter Journal Article* Review research notes, responses and short essays.	These are the document types in the database when browsing for the publication type: Journal articles. journal article bibliography journal article book review journal article conference report journal article electronic only journal article	Journals articles, chapters, books, reports, and dissertations.	these are the publication types found when browsing in the database: book book chapter book review conference paper dissertation film review	Journal Article, Book, Film, and Software Review, Dissertation and Book Chapter	Article; book; collection dissertation
<b>Does it contain cited references in source publications?</b>	Yes, but only when the full text appears.	No	NO	Yes	Yes. Since 2002	Yes. Since 2001	Yes

<b>Question/ aspect</b>	<b>America: History and Life (AHL)</b>	<b>ATLA Religion Database</b>	<b>Index Theologicus (IxTheo)</b>	<b>Index Islamicus</b>	<b>ERIC (Educational Resources Information Center)</b>	<b>Library Literature &amp; Information Science Index</b>	<b>Education Abstracts</b>
<b>Database producer</b>	EBSCO	EBSCO, OCLC, Ovid/SilverPlatter	UB T"ubingen	CSA Illumina	IES (Institute of Education Science) U.S. Department of Education Computer Sciences Corporation ERIC Project (USA)	The H.W. Wilson Company	The H.W. Wilson Company
<b>Dates of coverage</b>	1964 - current	1949 - current	1995 - current (retro 1976 - 1994)	1906 - current	1966 - current	1984 - current (also: Library Literature & Information Science Retrospective: 1905-1983)	Full Text and Abstracting from 1994; Indexing from 1983 (also: Education Index Retrospective: 1929-1983)
<b>Which (sub)disciplines does it cover</b>	America: History and Life is a comprehensive bibliography on the history and culture of the United States and Canada from prehistory to the present.	Indexed bibliography to journal articles, book reviews, and collections of essays in all scholarly fields of religion.	Contains information about published literature from journals and Festschriften in Theology and Religious Studies from the entire world.	The Index Islamicus database indexes literature on Islam, the Middle East and the Muslim world.	ERIC provides ready access to education literature. Broad Subjects: Behavioral Sciences; Humanities; Social Sciences Specific Subjects: Arts & Literature; Behavioral Science; Education; Law; Psychology.	Library Literature & Information Science is a bibliographic database that indexes articles and book reviews of key library and information science periodicals published in the United States and elsewhere.	Education abstracts is a bibliographic database that indexes and abstracts articles of at least one column in length from English-language periodicals and yearbooks published in the United States and elsewhere.
<b>Size: How many records does it contain as from the starting year?</b>	No information found	Over 1,600,000 records as of January 2009	411,625 records as of January 2009	Over 377,040 records as of January 2009	Over 1,285,849 records as of February 2009	240,000+	560,000+

<i>Question/ aspect</i>	<i>America: History and Life (AHL)</i>	<i>ATLA Religion Database</i>	<i>Index Theologicus (IxTheo)</i>	<i>Index Islamicus</i>	<i>ERIC (Educational Resources Information Center)</i>	<i>Library Literature &amp; Information Science Index</i>	<i>Education Abstracts</i>
<i>What type of sources does it cover (e.g., journals, books, proceedings volumes, grey literature)?</i>	Abstracts and citations for articles appearing in over 2,000 journals published worldwide. The database also includes citations to book reviews from approximately 140 journals of American history and culture and relevant dissertations from Dissertation Abstracts International.	Literature from journals and multi-author works (such as Festschriften and conference proceedings); book reviews	Literature from ca 600 journals, Festschriften, and congress publications	Over 3,000 journals, conference proceedings, monographs, multi-authored works and book reviews	In addition to the journal literature, ERIC indexes education-related materials from scholarly organizations, professional associations, research centers, policy organizations, university presses, the U.S. Department of Education and other federal agencies and state and	Periodicals, books, conference proceedings, library school theses, and pamphlets.	Book, journal, exhibit, speech, symposium
<i>Does it contain all authors of a source publication?</i>	Yes	Yes	Yes	Yes	up to two personal authors	?	?
<i>Does it contain the institutional affiliations of all publishing authors, or only that of the first author, or no affiliations at all?</i>	No institutional affiliations	No institutional affiliations	No institutional affiliations	No institutional affiliations	The Institution (IN) field contains the name of the institution with which the primary author was affiliated.	No. ( It doesn't appear in the fields list)	No. ( It doesn't appear in the fields list)

<i>Question/ aspect</i>	<i>America: History and Life (AHL)</i>	<i>ATLA Religion Database</i>	<i>Index Theologicus (IxTheo)</i>	<i>Index Islamicus</i>	<i>ERIC (Educational Resources Information Center)</i>	<i>Library Literature &amp; Information Science Index</i>	<i>Education Abstracts</i>
<b>To which extent are author names and institutional affiliations standardized ?</b>	Author names as shown in the original publication	Author names standardized	Author names standardized.	Author names standardized	NO. The author names are entered into the index in the format of last name followed by first and middle names or up to two initials, as they appeared on the original article.	Yes. ("No user should have to search under multiple forms of a name. Personal names are cited consistently across all the Wilson indexes and databases")	Yes. Uniform name authority control
<b>Which categorization of documents into document types is used?</b>	Article; book review; collection; dissertation; media review	Article; book; essay; multimedia; review; serial	Journals; electronic journals; Festschriften; congress publications	Book; chapter; journal article; review	journal articles books research syntheses conference papers technical reports policy papers other education-related materials theses, dissertations, audiovisual media, bibliographies, directories, monographs.	Bibliography Biography Books Book parts Book Review Corporate Profile Excerpt from Book Exhibit Feature Article Interview Obituary Product Evaluation Speech Symposium	Biography Biography Books Book Chapter Book Excerpt Book Review Book Review Corporate Profile Do It Yourself Work Exhibit Feature Article Interview Interview Obituary Product Evaluation Speech Symposium
<b>Does it contain cited references in source publications?</b>	Yes	No	No	No	Only when full text is available	No.	No.

<b>Question/ aspect</b>	<i>Humanities Abstracts</i>	<b>SciELO (Scientific Electronic Library Online)</b>	<b>SOLIS (Social Sciences Literatures Information System)</b>	<b>Hrčak. Portal znanstvenih časopisa Republike Hrvatske. (Portal of scientific journals of Croatia)</b> This portal is supported by the Ministry of science education and sports, developed and maintained by the University computing centre.	<b>Lituanistika database of the humanities and social sciences in Lithuania</b>	<b>Slovenian database (The COBIB.SI union bibliographic/catalogue database ??) Slovenian Research</b>
<b>Database producer</b>	The H.W. Wilson Company	FAPESP (the State of São Paulo Science Foundation), BIREME (the Latin America and Caribbean Center on Health Sciences Information)	GESIS-IZ Sozialwissenschaften. <a href="http://www.gesis.org">http://www.gesis.org</a>		Science Council of Lithuania. <a href="http://www.minfolit.lt/index.php?content=eng">http://www.minfolit.lt/index.php?content=eng</a>	SICRIS (Slovenian Research Agency)?
<b>Dates of coverage</b>	Abstracts from 1994; Indexing from 1984	1940 - current	1945 - current	1952 - current		
<b>Which (sub)disciplines does it cover</b>	Covers Humanities. Specific Subjects: Arts & Literature; Philosophy & Religion	SciELO - Scientific Electronic Library Online is database of scientific journals on the Internet, particularly from Latin America and the Caribbean countries	Covering German-language literature on social sciences and their application fields	Hrcak is the central portal of Croatian scientific journals.	Contains a wide range of scientific abstracts on the current state as well as development of Lithuanian nation, state, society, culture and language.	It is the result of the shared cataloguing. For drawing up bibliographies of Slovenian authors, it also includes records on performed works.
<b>Size: How many records does it contain as from the starting year?</b>	643,000+	196,199 Articles	More than 370,000 (May 2008)	Articles without full text: 2,384 Articles with full text: 29,811	?	3.2 million (December 2007) bibliographic records

Question/ aspect	Humanities Abstracts	SciELO (Scientific Electronic Library Online)	SOLIS (Social Sciences Literatures Information System)	Hrčak. Portal znanstvenih časopisa Republike Hrvatske. (Portal of scientific journals of Croatia)	Lituanistika database of the humanities and social sciences in Lithuania	(The COBIB.SI union bibliographic/catalog ue database ??) Slovenian Research Agency
<b>What type of sources does it cover (e.g., journals, books, proceedings volumes, grey literature)?</b>	Journals, bibliographies, original works of fiction, drama, and poetry, book reviews, and reviews of ballets, dance programs, motion pictures, musicals, operas, plays, radio and television programs,	Journals	Journals, books and grey literature	journals, conference papers,	serials, monographs, sound recording, videorecording and motion pictures, cartographic material, printed and manuscript music, graphics, toys- objects, performed works, events, artistic performances,	
<b>Does it contain all authors of a source publication?</b>	?	Not	?	Yes	Yes	Yes
<b>Does it contain the institutional affiliations of all publishing authors?</b>	No. ( It doesn't appear in the fields list)	It doesn't contain the full reference, it is an electronic library	Yes, in the au author field following the name of the author, (but for all ?) ("The (S) operator may be used in the Author (/AU) field to specifiy functions as well as affiliations.")	No	?	No

<b>Question/ aspect</b>	<b>Humanities Abstracts</b>	<b>SciELO (Scientific Electronic Library Online)</b>	<b>SOLIS (Social Sciences Literatures Information System)</b>	<b>Hrčak. Portal znanstvenih časopisa Republike Hrvatske. (Portal of scientific journals of Croatia)</b>	<b>Lituanistika database of the humanities and social sciences in Lithuania</b>	<b>Slovenian database (The COBIB.SI union bibliographic/catalog ue database ??) Slovenian Research Agency</b>
<b>To which extent are author names and institutional affiliations standardized ?</b>	Yes. Uniform name authority control	No, (contains author index)	?	NO?	?	No
<b>Which categorization of documents into document types is used?</b>	Bibliography Biography Book Excerpt Book Review Corporate Profile Do It Yourself Work Exhibit Feature Article Interview Obituary Product Evaluation Speech Symposium	article, letter, editorial, interview, report, note,	Journal articles, contributions in compilations, monographs, and grey literature	articles, reviews, preliminary communications, notes, editorials, conference papers, meeting abstracts	?	Article, Review, Popular Article, Conference Contribution, book, Monograph Chapter, doctoral dissertation, reports, patents, software, artistic works, films...
<b>Does it contain cited references in source publications?</b>	No.			No	?	No