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Abstract
This entry provides an overview on the definition and evolution of grey literature in the emerging environment of digital resources and open access to scientific and technical information as well as the social sciences and humanities. First, it gives some empirical evidence on the importance of grey literature in scientific publications from different domains, especially library and information sciences (LIS), based on citation analysis. Other topics include the impact of Internet on the production of grey literature, the place of grey resources in open archives and institutional repositories, the development of bibliographic control and standardization, and the difficulties of identification and accessing grey documents. The entry ends with some predictions on the future of grey literature and open questions for research in LIS.

INTRODUCTION

A great part of scientific results are published first and/ or exclusively in reports, conference proceedings, preprints, working papers, theses, dissertations, personal communications, technical notes, etc. In spite of their widespread differences, all these documents are known by library and information science (LIS) experts as "grey literature" because they share two common characteristics: they are outside of the realm of commercial publishers and do not always receive sufficient bibliographic control in catalogs, databases, and bibliographies. Grey literature however should not be confused with ephemera.

How important is grey literature for scientific publishing, are there distinctions between the different research domains? What is the usual definition of grey literature, does it change in the environment of digital libraries and New Technologies of Information and Communication (NTIC)? What types of science and technology information (STI) does the term "grey literature" cover, how is it disseminated, how can it be assessed? In which way is grey literature related to and impacted by open archive initiatives? Who does research on grey literature, and what are the frontline topics for LIS research?

The following entry addresses these and other questions but acknowledges that there still remain unanswered questions because of the rapid evolution of information technologies and practices. Nevertheless, we conclude with nine predictions on the future of grey literature.

WHAT EXACTLY IS GREY LITERATURE?

There are several definitions of grey literature, the most common being the so-called "Luxembourg definition," which was discussed and approved during the Third International Conference on Grey Literature in 1997: "[Grey literature is] that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers." In 2004, at the Sixth International Conference on Grey literature in New York City, a postscript was added to the Luxembourg definition for purposes of clarification ". . .not controlled by commercial publishers i.e., where publishing is not the primary activity of the producing body."

This definition in itself contains two of the main characteristics of "grey" resources: On the one hand they are universal and ubiquitous, but on the other hand, they are difficult to identify and to obtain through conventional publishing circuits.[1] The Luxembourg definition is also vague enough to reflect the problem of determining exactly what a type of literature variously described as "ephemeral," "nonconventional," or "underground" really means. To quote two experts from the British Library, "grey literature is difficult to define."[2] What the Luxembourg definition did achieve was to address the supply-side of grey literature, which had been neglected in deference to its demand-side.

More recently, the "Prague definition" added other criteria to clarify the nature of grey literature in the digital environment: its character as a document and work of the mind, a minimum quality level and its interest for library acquisition and collection building (mediation).[i]

Another definition is from the U.S. Interagency Gray Literature Working Group, "Gray Information Functional Plan," January 18, 1995, that defines gray (or grey) literature as "foreign or domestic open source material that usually is available through specialized channels and may not enter normal channels or systems of publication, distribution, bibliographic control, or acquisition by booksellers or subscription agents."[3]

In fact, the term traditionally covers three categories of documents—conference proceedings, reports, and doctoral theses—that are often printed in short runs. Nevertheless, the borderline with "white" or "conventional" literature is permeable, since some conference proceedings are published by commercial publishers, as monographs in serial publications or journals, and the same is true for some reports. As for doctoral theses, especially in the humanities and social sciences, some are also found on the commercial publishing market.

However, regarding all the other documents that circulate outside conventional publishing circuits, the lack of "commercial control" raises real problems for academics and scientists as well as for information professionals when it comes to locating and acquiring them. The lack of "commercial control" and promotion also often implies a lack of "bibliographic control." In other words, these documents are often inadequately referenced in catalogs and databases, so that searches through this category of scientific information require specialized knowledge on sources and circuits.

THE WHO'S WHO IN GREY LITERATURE

Information professionals—including archivists, librarians, researchers, and teachers—have been contributing to studies on grey literature for over 30 years now, compiling a rich corpus of articles and, since 1993, international conference papers on grey literature.[4] In 1985, several European national libraries and information centers founded the European Association for Grey Literature Exploitation (EAGLE) to identify and disseminate grey literature. In the 1990s, governmental initiatives in France resulted in particular in the establishment of two national "one-stop shops" for

accessing reports of general or scientific interest (La Documentation Française, Inist-CNRS). Other countries have designated "deposit and distribution centers" [such as the British Library[5] for the United Kingdom or the TIB (German National Library of Science and Technology) Hanover[6] for Germany] or established portals for scientific reports (such as GrayLit for U.S. Federal Agencies), which was discontinued in 2007.

From 1992 on, Farace, a former member of the EAGLE technical committee founded GreyNet, the Grey Literature Network Service,[7] which organizes the international conference series on grey literature. Conferences in the GL-Series have since taken place in Amsterdam (1993, 2003, and 2008); Washington, D.C. (1995, 1999, 2009, 2011, and 2014); Luxembourg (1997); New York (2004); Nancy, France (2005); New Orleans (2006); Antwerp, Belgium (2007); Prague, Czech Republic (2010), Rome, Italy (2012), and Bratislava, Slovak Republic (2013).
The more than 350 authors and researchers in the field of grey literature, who have contributed over the past years to the above conference programs form as it were the WHOIS in grey literature along with the host and sponsoring organizations, whose financial contributions guarantee the continuity and longevity of research programs and projects in the various sectors of government, academics, business, and industry.

The TextRelease Conference site [4] provides biographical notes for over 200 academics, scientists, and professionals who work and publish on grey literature. Since 1999, authors and researchers who have demonstrated outstanding achievements in this field of information and whose results were presented and published in the GL-Conference Series are among the recipients of the Annual GreyNet Award[ii]

To date, only two monographs have been published on grey literature. The first titled "Use of Reports Literature" by Charles P. Auger in 1975[9]. In 1989, Auger's second edition for Bowker-Saur was retitled "Information Sources in Grey Literature." This title change was indicative of the fact that reports were only one type of grey literature among increasing sundry of other types; and that the term "grey literature" was most suited to capture this phenomenon. Auger's work saw a 4th edition in 1998. Unfortunately, however, in this his final edition, the rise of electronic grey literature was almost completely neglected. In 2010, a second monograph entitled "Grey Literature in Library and Information Studies" edited by Joachim Schöpfel and Dominic Farace was published by De Gruyter Saur. While this monograph was written with students and instructors of Colleges and Schools of Library and Information Science in mind, it likewise serves as a reader for information professionals working in any and all like knowledge-based communities.

The only current journal dedicated to grey literature is The Grey Journal, TGJ (ISSN for the print edition 1574–1796) published by TextRelease in cooperation with GreyNet International. Since its creation in 2005, some 180 articles were published in its first 10 volumes. In 2008, this flagship journal for grey literature was awarded the prestigious Victorine van Schaick Prize. TextRelease/GreyNet also maintained a cooperative publishing agreement with PRQ, Publishing Research Quarterly (2004–2007) whereby the annual spring issue of that journal was solely dedicated to articles on grey literature, originating as papers in the GL-Conference Series; this accounts for another 35 journal articles. Both TGJ and PRQ maintain licensing agreements with EBSCO Publishing, whereby the full-text of both TGJ and PRQ are online, available in the Library, Information Science & Technology Abstracts (LISTA)-FT database. Earlier IJGL, International Journal on Grey Literature (ISSN 1466–6189) was edited in 2000 by Emerald (former MCB University Press). However, it ceased publication after the first volume of four issues totaling 23 journal articles; these articles are nevertheless still available on the Emerald server. Most other articles on grey literature are published in other serials in LIS or journals from other scientific domains such as The Lancet, Marine Policy, and European Psychiatry.

While it is rather easy to identify specific landmarks in the history of grey literature studies, it is perhaps first more constructive to indicate timeframes in which grey literature has developed. Five such periods can be distinguished.

1. They begin with the years leading up to 1979 in which numerous uncontrolled terms such as ephemera, fringe literature, fugitive literature, non-conventional literature, non-published literature, report literature, research outputs, small-circulation literature, unconventional literature, unpublished literature, etc., were coined to capture the growing phenomenon.
2. The period 1980–1990 covered the development and launch of national and international programs on grey literature (1985 is the year in which the European network EAGLE was created).
3. The period 1990–2000 included the creation of GreyNet, the Grey Literature Network Service (1993 is the year in which the first international conference on grey literature was convened).

4. The years 2003–2005 covered the re-launch of the Grey Literature Network Service showcasing new projects in the context of the explosion of digital resources, the movement for open access to scientific and technical information, and the Web2.0.

5. The current timeframe from 2006 onward is one in which new cooperative management and

> research initiatives are on the rise. This is witnessed in the spring of 2014 by the Pisa Declaration on Policy Development for Grey Literature Resources endorsed now by over 100 information professionals from leading organizations worldwide. The time of going it alone is now ended. The Pisa Declaration marks the close of era of *ad hoc* policy and decision making with regard to grey literature resources.[iii]

Early on in this current timeframe was the start-up of the OpenSIGLE project in 2007 [10] an initiative powered by Inist-CNRS to provide access to former SIGLE records in an open source context. And, in the spring of 2008, GreyNet signed on to the OpenSIGLE Repository in order to preserve and make openly available research results originating in the International Conference Series on Grey Literature.[11] In so doing, the OpenSIGLE Repository (renamed OpenGrey Repository in 2011) has now become the intersection of more than a quarter century of bibliographic information on grey literature with over 20 years of research in the field. Another initiative is the collaboration of researchers in the field of grey literature on institutional levels involving cross-country and international partnerships. Another initiative was the pilot for a distance learning course on grey literature for (post)graduate students, one that was accredited by the University of New Orleans (UNO) and which is now available to other academic institutions.

ON THE (RELATIVE) IMPORTANCE OF GREY LITERATURE

Grey literature has a role of its own as a means of distributing scientific and technical information,[12] and professionals insist on its importance for two main reasons: research results are often more detailed in reports, doctoral theses, and conference proceedings than in journals, and they are distributed in these forms up to 12 or even 18 months before being published elsewhere.[1] We might add that some results simply are not published elsewhere.

But how do researchers actually use grey literature? One way of evaluating this is to analyze the citations given in their publications. In order to obtain empirical evidence, we present two different approaches: first, results from a Franco-Dutch study launched in 2004 and revisited in 2005 with evidence for different scientific disciplines, and second, results from a small study of bibliographic references published in four different journals in LIS.

Citation Analyses

Let us look first at some results from the Franco-Dutch study[13,14] which analyzed 64 citation analyses published between 1987 and 2005, citing altogether several thousands of references. Table 1 shows the proportion of grey literature cited in publications from different scientific disciplines.

The relative importance of grey literature is largely dependent on research disciplines and subjects, on methodological approaches, and on sources used. In some fields, especially the life sciences and medical sciences, there has been a traditional preference for conventional distribution media (journals), while in others, such as agriculture, aeronautics, and the engineering sciences in general, grey literature resources tend to predominate.

Table 1 Proportions of grey literature citations in selected scientific domains

Field	Grey literature citations (in %)
Soil science	14
Biology	5–13
Veterinary medicine	6
Psychiatry (addiction)	1
Psychology	3
Engineering sciences	39–42
Economic sciences	9–17
Sociology	7–9
Education sciences	14–19

In particular, public administrations and public and industrial research laboratories produce a great deal of "grey" material, often for internal and in some cases "restricted" dissemination.[15]

Publications in LIS

For a more accurate idea of the way grey literature is used in LIS, we analyze recently published articles from four representative, refereed LIS journals with impact factor.

Emerald's Journal of Documentation (ISSN 0022-0418) published 13 articles in the first two issues of 2007 (vol. 63), with 472 bibliographic references. About 16% of these references are to grey literature.

The first issue of 2007 (vol. 43) of Elsevier's journal on Information Processing & Management (ISSN 0306-4573) contains 17 articles with a total of 469 references. Of them, 80% cite commercial material (e.g., serials, monographs, and conference series), while the other 20% are grey.

The journal Information Technology & Libraries (ISSN 0730-9295) is published by the American Library Association (ALA). The four issues in 2006 (that comprise vol. 25) contain 24 articles with 512 references, 36% of which are to grey literature.

Finally, when we examine the 18 papers comprising the second issue of 2007 (vol. 12) Information Research (ISSN 1368-1613), we find 374 bibliographic references,

18% of which are to grey documents. Note that "Information Research" is an international electronic open access journal from the University of Sheffield (U.K.).

Four journals, eight issues, 72 articles with 1827 bibliographic references is not a large sample. Nevertheless, let's sum up the evidence in the following three points:

Grey literature apparently plays a considerable part in the LIS, accounting on average around 20% of all sources used. This figure may be compared with the citation habits in economics and educational sciences (see above).

Even so, citations to grey material vary widely between different papers from 0% to 50% and more, depending at least in part on subject areas and methodologies.

Most of the noncommercial documents might be identified as unpublished material e.g., doctoral or master theses, reports, legal texts, working papers, lecture notes, Web sites, and even posted messages. This also holds for some conference proceedings and other serial resources, for the identification of the exact nature of the cited material poses difficulties. However, all of these above mentioned types of documents have in fact been published by what can be referred to as corporate authors i.e., organizations responsible for producing the grey literature, but whose primary activity is not publishing.

Another issue related to the publication of grey literature is the peer review process, which it undergoes in varying degrees. The IPCC affaire ("climategate") exposed grey literature to the wider public and defends the further use of grey literature. Grey literature requires alternative models for peer review. Community sourcing lends itself to the review of grey literature which focuses more on the review process than the end product and is more apt to include negative results in publications.[iv]

ON THE TYPOLOGY OF GREY LITERATURE

To return now to the definition of grey literature, we indicated earlier that the term traditionally refers to reports, conference proceedings, and doctoral theses. We will now take a closer look at what these cover in reality. The SIGLE database has been supplied since the 1980s with information from organizations in several European countries. Its more than 800,000 references are distributed as follows (Table 2).

Reports are the most numerous by far among the different types of grey literature in the SIGLE database. But the "reports" category covers a wide variety of very different documents: institutional reports, annual or activity reports, project or study reports, technical reports, reports published by ministries, laboratories or research teams, etc. Some are disseminated by national and international public bodies; others are confidential, protected, or disseminated to a restricted readership, such as technical reports from industrial R&D laboratories. Some are voluminous, with statistical appendices, while others are only a few pages in length.

In the other categories, citation analyses[14] offer a tremendous range of grey resources. Besides theses and conference proceedings, they also include unpublished manuscripts, newsletters, recommendations and standards, patents, technical notes, product catalogs, data and statistics, presentations, personal communications, working papers, house journals, laboratory research books, preprints, academic courseware, lecture notes, and so on. GreyNet in fact maintains an extensive online listing of document types, which are categorized as grey literature.[v]

However diverse, these documents all share one thing in common, they contain unique and significant scientific and technical information that is often never published elsewhere. The lack of descriptive referencing and adequate circulation is therefore, as we have said earlier, a real problem for scientific communication.

Table 2 Distribution by the types of documents referenced in the SIGLE database

Document types	Proportion (in %)
Reports	62.7
Theses	31.7
Conferences	2.3
Data files	2.1
Translations	0.9
Other	0.3

The Internet, however, is now altering the entire landscape. Not only because of changing user behavior, but also, and especially, because more and more grey literature is being published on the Web. As one study from the German Centre for Information in the Social Sciences has pointed out,[16] the switch from paper to digital does not necessarily mean that more grey literature is appearing. Instead, the Internet has radically changed access and distribution methods, accentuating the ephemeral and volatile nature of grey literature. This same study also drew attention to the fact that many journals and the journal articles contained therein can be categorized as grey literature i.e., where publishing is not the primary activity of the producing body. The fact that in Europe, for more than two decades the SIGLE database did not identify journals and journal articles as grey literature may account in part for the apparent neglect of these two types of grey documents.

And yet, another special type of grey material is also likely to gain more importance. Until recently, research data—the basis for many scientific publications—are widely unpublished and inaccessible. Today, public research organizations are starting to develop national and international strategies for the control and archiving of these files, the data, and statistics (scientific data infrastructure or eScience, see Hey and Trefethen[17]). The principle of open access to datasets is generally accepted (astronomy, life science, physics, etc.) but major Scientific, Technical, and Medical (STM) publishers, because of their historical role and responsibility in the dissemination of scientific results, claim that such data should become part of their portfolio of added value products much like scientific journals and articles. Up until the mid-1990s, the Dutch Social Science Information and Documentation Center (SWIDOC), an institute within the Netherlands Academy of Arts and Sciences (KNAW), maintained a paradigm, whereby current research information and statistical data-sets were linked to reports and other grey literature. Unfortunately, this model was abandoned. However with the rise of repositories such as OpenGrey, attachments and links to a metadata record can now be cross-linked to related research data in other specialized archives – thus allowing access to the enhanced publication. In 2011-2012, GreyNet undertook an Enhanced Publications Project cross-linking research data originating in the GL-Conference Series that became housed in the DANS Data Archive in The Hague (NL) with its corresponding metadata and full-texts housed in the OpenGrey Repository in Nancy (FR). From 2013 onward, this cross-linking became part of GreyNet's sustained workflow. Now that this paradigm can be fully realized, the coming years will determine who will gain control over the deposit and dissemination of these materials. Will it be the public bodies or corporate information companies, who win out? The question is not only political but economic as well.

GREY LITERATURE IN OPEN ARCHIVES

Since 1994, the movement toward open access to scientific information has been crystallizing around various initiatives to promote open archives.[18,19] The first preprint server, ArXiv, set up by P. Ginsparg at Los Alamos in 1991 was a means for distributing research results organized by and for physicists, without intermediaries. This initiative was entirely independent of any commercial circuit for scientific publications.[20] In this sense, the server (which today contains nearly one million items) corresponded exactly to the definition of grey literature.

However, the case is more complex. "Preprints"[21] would not have existed without the prospect of "print"—in other words, ArXiv would not have existed without scientific journals. Ginsparg's aim was simply to circulate results quickly and immediately. The point then was not to bring commercial publishing into question, since Ginsparg did not offer any alternative to the peer review system still run by the conventional publishing circuit. ArXiv was in fact creating a kind of symbiosis between grey literature and traditional publishing, which was linked to the highly specific organization of the nuclear physics community.

But the crisis that has hit scientific journals along with the appropriation of new technologies of information and communication has together helped to turn the means of distribution into an alternative model of scientific publishing. This model has two objectives, one being economic: in that it offers a cheaper alternative to scientific publications by increasing pressure on STM publishers introducing competitive and parallel publishing channels. The other being an administrative one: by facilitating control over scientific production issuing from various research organizations and universities by way of identifying and evaluating publications through a central database.

Given the methodological and interpretative diversity among different scientific communities, one may well wonder whether a system that has operated for more than 15 years in physics will be equally effective in other fields, especially in view of the constraints induced by research evaluation. However, we are seeing derivatives of that system in the social and human sciences spearheaded by organizations such as the New York Academy of Medicine (NYAM) with their Grey Literature Report, the Centre for Information on Low External Input and Sustainable Agriculture (ILEIA) with their LEISA e-magazine and database, and the New York University (NYU), School of Social Work with their Web-based resource Information for Practice.[24]

What is the part played by grey literature in this new environment? The international "Directory of Open Access Repositories" (OpenDOAR), established by the Universities of Nottingham and Lund,[25] identifies 2,722 different sites, including 452 from the United States and 229 from the United Kingdom (August 2014). OpenDOAR indexes some categories of grey literature, including theses[26] and conference proceedings, but also learning objects (especially university lectures) and research results (data sets). Table 4 shows the number of open archives that contain certain categories of grey literature.

At first sight, these figures seem to suggest that grey literature is relatively well represented in open archives: 50% contain doctoral theses, and about 40% contain conference proceedings, reports or working papers. However,

Table 4 Presence of different document types in the OpenDOAR archives (N=2,722)

Document types	N archives	In %
Theses	148	54
Unpublished reports and working	992	36
Conference and workshop papers	962	35
Learning objects	453	17
Other special item types	474	17

the picture becomes less clear with an analysis of archive descriptions, which show that the number of sites explicitly dedicated to grey literature is considerably smaller: less than 20% are identified for doctoral theses, only 5% for reports, and just 1% for conference proceedings. Probably, a lot of grey material is hidden in categories like "special" (letters, images, sound, sites, etc.), "unpublished" (preprints, etc.) or "multimedia." Observations made at the Seventh International Conference on Grey Literature in 2005 indicate that these documents are often swamped within the sheer mass of documents that are deposited in archives and/or difficult to identify. The development of open archives does not therefore seem to have altered the situation of grey literature to any great extent.

To sum up, we observe a steadily growing number of open archives that (also) contain grey literature. It is nearly impossible to give an overall number of grey documents in these repositories. And even if it were possible, those documents are not currently representative of the national output of scientific and technical information. Moreover, there are even fewer repositories in smaller countries, especially outside of Europe and North America; and, non-English material remains until now largely invisible and un-retrievable.

IMPROVING "BIBLIOGRAPHIC CONTROL"

We said earlier that the lack of "commercial control" of grey literature may imply a lack of "bibliographic control." In other words, "grey" documents are often inadequately referenced in catalogs and databases.[27] This does not mean that there are no standards or recommendations for cataloging reports, conference proceedings, theses, and so on. However, contrary to the situation with journals and books, the absence of commercial stakes has contributed to a (relative) "success" of the rules that have been set out.

The way in which the different types of grey literature are referenced still depends more on choices made by the bodies that produce, collect, or distribute these documents, rather than on any national or international standard (ISO, ISBD). The failure of the International Standard Technical Report Number (ISRN) is symptomatic in this respect. France, having been the only country with an active ISRN agency (Inist-CNRS) for several years, eventually had to agree to the ISO, thus abandoning the ISRN. The only remaining exception in France concerns doctoral theses submitted to French universities for which the academic union catalog Systeme universitaire de documentation (SUDOC) imposes a uniform bibliographic format.

On a European level, input requirements for the SIGLE database forced the network's member countries to attempt to harmonize their "grey" resources around a single SGML format. But input to SIGLE ceased in April 2005, and its EAGLE association has gone into liquidation.[28] The predictable outcome is that each organization will be returning to its own referencing methods and rules abandoning any kind of uniform bibliographic control.

The rapid development of the Internet, and its ever-multiplying online resources, is affecting bibliographic control in two ways.[16] In one way, this "wild growth" is speeding up the decline in the application of formal and controlled standards, with the risk that grey literature is becoming "even more greyish." However, in another way, the same risk has also boosted global awareness of the need to define a few minimal data—called metadata[29]—in order to provide a framework for referencing digital documents.

Examples include: a project aiming to adapt the Dublin Core to reports[30] or doctoral theses; the French "Theses Electroniques Françaises" (TEF) initiative, which is working on a set of metadata and a single XML schema, the "Text Encoding Initiative" (TEI) designed to develop and recommend, at international level, common tagging standards that are independent from IT upgrades,[32] and the creation in 2005 of a TEI support centre for Europe located in Nancy, which will also address the matter of grey literature.

The problem of poor standards and lack of uniformity in referencing documents deposited in institutional archives was the reason why JISC (Joint Information Systems Committee)[33] was established in the United Kingdom in 1993. Its task was to look into the interoperability of these archives and to describe their resources in order to facilitate identification by end-users.

After the Seventh International Conference on Grey Literature in 2005, P. de Castro and S. Salinetti from the Istituto Superiore di Sanitàin Rome initiated the International Steering Committee on Grey Literature (GLISC), which would develop recommendations (the "Nancy Style") for the production and distribution of scientific and technical reports as well as other grey literature. The second version of the document is now published on the Web,[34] with translations into French, Italian, German, and Spanish. This last example is symptomatic in some ways of the problem of bibliographic control of grey literature. It is an international issue to which national responses have only brought partial solutions, thereby actually increasing the diversity of data and the difficulties involved in identifying

and locating documents. Since there are no set commercial issues at stake, improved referencing will always be dependent on the initiatives and willingness of producing and distributing organizations steered by a few committed information professionals.

In early 2013, the GreyGuide Project – Guide to Good Practice in Grey Literature was initiated and during the GL15 Conference in December of that year, the GreyGuide Repository was launched. The goal of this repository of good practices in grey literature is to provide the many stakeholders in government, academics, business and industry the benefits of experience, sustained management, and proven results in this field of information. The GreyGuide Project was extended in 2014 to include a number of GreyNet's web-based collections and resources. In so doing, the GreyGuide Repository would further serve as a web access portal for good practices and resources in grey literature.[vi]

ACCESS AND DISSEMINATION

Identifying, locating, and obtaining grey literature is generally not easy—and this is inherent to its nature. To get some idea of the problem, readers might attempt a search for some of the reports, working papers, Web pages, conference proceedings, and doctoral theses cited by the authors of the four LIS journals mentioned earlier in this entry.

For 20 years, the SIGLE database offered a solution at EU level, insofar as its partner organizations were under obligation to keep referenced documents at their end-users' disposal via lending or document delivery services.

Users today are faced with a huge variety of sites, archives, catalogs, and databases, which makes searches for "grey" information not only painstaking but sometimes prohibitive—taking into consideration the linguistic difficulties involved.

In view of the rapidly changing face of STI within the digital environment, all the major traditional centers collecting and distributing grey literature, such as the British Library, the Canadian Institute for Scientific and Technical Information,[35] the TIB in Hanover, and Inist-CNRS have undertaken to develop free access services to these documents, especially theses and preprints, but also reports and other types of grey literature.[36]

What is now needed are portals and search tools that are specifically dedicated to "grey" documents. Elsevier started to index in their SCIRUS search engine NASA reports and dissertations, MIT courseware, working papers and communications from a number of institutions, as well as theses in electronic format from the United States, China, India, and other countries. The Office of Scientific and Technical Information (OSTI) at the U.S. Department of Energy (DOE), hosted the GrayLit Network's unique science portal of technical reports from U.S. Federal Agencies. Now that this portal has been discontinued, we look to OSTI/DOE's Keynote Address at the Tenth International Conference on Grey Literature (Amsterdam, December 2008) in order to see if and how the global science gateway, WorldWideScience.org and its multilateral governance structure, the WorldWideScience Alliance will incorporate scientific and technical grey literature (including the social sciences and humanities).[3] A European comparative initiative from members of the former EAGLE association to launch a metasearch engine dedicated to grey literature collections is still in draft stage.[37] In the meantime, users have no other choice but to conduct searches on their own using whatever means at hand (Google), or to remain with the search services provided by established organizations.

The short history of EAGLE indicates some challenges of grey resources. Initially funded by the Commission of the European Communities in order to provide access to European grey literature and improve bibliographic coverage,[1] EAGLE was faced 20 years after its creation with major problems that lead to its liquidation:[28] The SIGLE database offered no solutions for online cataloging, metadata harvesting, links to full-text, and other resources. National input became increasingly unrepresentative of the national production, and was continuously decreasing while digital documents were not referenced. And last but not least, the economic model of its nonprofit, low-budget association did not allow for necessary strategic decisions, because further investment for the development of the database was not provided by the European Union or by the member institutions.

THE FUTURE OF GREY LITERATURE

Grey literature will remain a challenge for information and documentation professionals as well as an interesting field for research activities in at least six areas:

The need for a new definition: The traditional definition of grey literature needs to be further refined and/or redefined by way of an accurate analysis of new means of access and distribution, in line with Mackenzie Owen's observation that "Grey does not imply any qualification (but) is merely a characterization of the distribution mode."[38] What we see is that the current "Luxembourg" definition moved from emphasis on the acquisition of grey literature to the production of grey literature. And now, the definition should reflect both.

The need for an economic model: Despite the absence of "commercial control," collecting, distributing, and searching grey literature all come at a price, which may in fact be much higher than for journal article and book searches. To date, there is no clear economic model in this area and further analysis is needed in terms of investments, direct and indirect costs, acquisition prices, and so

on. The case of EAGLE underlines the need for public funding and a sustainable economic model to guarantee the bibliographic coverage and full-text, enriched dissemination of grey literature.

The need to oversee archiving practice: New technologies of information and communication facilitate resource archiving in general, and there is strong incentives from the "open access" movement. Nevertheless, the question of "who should archive what, where, when, and for how long" has remained largely unanswered. Aware of information policy and the concomitant financial aspects involved, answers are rather urgently needed, even if they were to now address only part of grey literature resources.

The need for a new "value chain": In the Netherlands, Roosendaal has in the past few years, been examining the process whereby universities re-appropriate publications. In his work, he highlights the radical changes taking place in the "value chain" of scientific publication.[39] This type of research and evaluation of scientific publications brings to the forefront major issues in the context of emerging STI trends. What is the future of peer review? Which "quality label" applies to working papers or scientific communications on blogs or in open repositories? Does the community approach of Web 2.0 offer a viable solution for the need for quality standards of noncommercial STI materials? The impact of new technologies in information and communication on the dissemination of non-conventional literature is a complex matter, and the potential field for research is vast. To date, research and analyses have only broken ground giving way to a vast and virtually untapped field of investigation.

The need to clarify the legal aspects: In our study, the issue of intellectual property rights in grey literature has been deliberately left aside. Nevertheless, the legal status of grey resources and rights in their use (deposit, archiving, distribution, etc.) is (another) major challenge for the future of this form of STI publishing. The national and international legal environment is evolving rapidly, and all restrictions, exceptions, and technical constraints [Digital Rights Management (DRM), interoperability, etc.] of the new laws on intellectual property, author's rights, and copyright also apply to grey resources. Nevertheless, very few documentary analyses have addressed legal aspects in the field of grey literature and their subsequent economic consequences. This issue, however, will be taken up in a plenary session during the Tenth International Conference on Grey Literature (Amsterdam, December 2008). While the outcome of this forum may not be conclusive, much needed groundwork will have been covered.

The need for education and training: At the Sixth International Conference on Grey Literature (New York, 2004), the results of an online survey in which 102 respondents participated not only indicate that an increasing number information professionals involved in grey literature are also involved in teaching and instruction but also they were in agreement (69.2%) with the statement that grey literature constitutes a field in information studies. Over the past years, training courses, guest lectures, seminars, and workshops have been organized by information professionals on the topic of grey literature. Two such examples are the GreyForum, a series of workshops launched in 2013, where grey literature provides common ground for informational professionals in the process of knowledge transfer. The first three workshops in this series have dealt with information ethics, information rights, and policy development with regard to grey literature.[vii] The second example is GreyWorks, a summer workshop series on grey literature (2009-2013) intended to convey the state of art in this field of information.[viii] Most of these endeavors have undoubtedly had some impact on this field of information. As mentioned earlier in this entry, an accredited college course on grey literature was carried out via UNO's distance education program in the fall semester 2007 and was again offered in the spring 2009 semester. Education and training is fundamental to the future of grey literature—not only for LIS students and their instructors but also for information practitioners in government, business, and industry as well.

While the above six areas of consideration remain as yet to be fully addressed, there has been considerable effort on the part of Inist-CNRS and GreyNet over the past 20 years to use the results of research compiled within the International Conference Series on Grey Literature,[13,14] and, at the same time, to involve the existing pool of GL authors and researchers, who have contributed to its information and knowledge base. Without them, the future of grey literature would have little or no direction based on empirical data and would be simply *speculative*. It would have remained among the myriad of uncontrolled terms listed earlier in this entry.

In 2014, GreyNet expanded its infrastructure to include three new committees alongside the GL Conference Program Committee. These include a Community Management Committee focused on publishing, communication, and social media; a Resource Policy Committee geared to repositories and web-based resources; and a LIS committee on education and training in grey literature.

CONCLUDING REMARKS

In concluding our current review on the state of grey literature, we might offer the reader some prospects in further need of reflection.

It seems likely that:

1. Grey literature will not disappear, but will continue to play a significant role alongside commercial publishing. Our research has led us to believe that information discovery into the various types of grey literature available in print and electronic formats is ever increasing.
2. The borderline between "grey" and "white" (commercial) literature will become increasingly indistinct, particularly in an environment that is moving toward open access to STI. However, in our limited research we find that the approaches and appropriations to these two kinds of publications are still quite distinct.
3. The proportion of "grey" documents published on the Web will continue to increase. We see this development closely linked to the production of grey literature in e-environments, as well as to retrospective activities leading to republication.
4. The Internet will encourage a greater diversity in the types of "grey" resources available (raw research results, notes and personal comments, lectures, newsletters, product catalogs, etc.). Also as our own research indicates, grey journals and the articles contained therein even now challenge reports as being the mainstay of grey literature.

It also seems likely that:

5. Bibliographic control of grey literature will remain problematic despite the trend toward standardization of digital documents. We find that this has everything to do with the application and use of standards, which are in transition.
6. Open archives will offer more appropriate services and functions for at least some segments of grey literature i.e., preprints, doctoral theses, and reports. We mention these three types of grey literature, because they have come to form special collections making them more visible in and for repositories.
7. Some organizations—especially in the public sector (e.g., national libraries and STI centers) but also in the private sector (e.g., Elsevier, Google, etc.)—will develop tools and services to aid in the efficient exploitation of grey resources on the Web. This in all likelihood is based on the response by such organizations to our research efforts.

However, it seems unlikely that:

8. Searching and collecting grey literature will become as straightforward as it is for journals and books in the traditional publishing sector. We adjudge that the increase in grey over commercial publications is the main explanation for this.
9. New tools for collecting, depositing, and archiving will make grey literature less ephemeral and volatile than in the past. Our research indicates that until an organization formulates a policy on grey literature backed by budget appropriations, the implementation of technology cannot be guaranteed and thus the environment in which grey literature has coexisted in the past will remain unstable in the likely future.

REFERENCES

1. Abel, R. Book and journal publishing. In Encyclopedia of Library and Information Science. 2nd Ed., First Update Supplement; Drake, M., Ed.; New York: Taylor & Francis, 2005.
2. Wood, D.N.; Smith, A.W. SIGLE: A model for international co-operation. Interlend. Doc. Supply, 1993, 21 (1), 18–22.
3. GrayLit Network, A science portal of technical reports (discontinued October 2007).
4. TextRelease, Program and Conference Bureau. http://www.textrelease.com (accessed August 2014).
5. Purday, J.; Crump, M. The British Library. In Encyclopedia of Library and Information Science. 2nd Ed., First Update Supplement; Drake, M., Ed.; New York: Taylor & Francis, 2005.
6. Umlauf, K. German academic libraries. In Encyclopedia of Library and Information Science. 2nd Ed., First Update Supplement; Drake, M., Ed.; New York: Taylor & Francis, 2005.
7. GreyNet, Grey Literature Network Service, http://www.greynet.org (accessed August 2014).
8. Farace, D.J.; Frantzen, J. Four winds on the grey landscape: A review of four information professionals, their work and impact on the field of grey literature. In Fifth International Conference on Grey Literature: Grey Matters in the World of Networked Information, GL5 Conference Proceedings, Amsterdam, the Netherlands, December 4–5, 2003; Farace, D., Frantzen, J., Eds.; Text-Release: Amsterdam, 2004.
9. Auger, C.P. Use of Reports Literature; Butterworths: London, 1975.
10. http://opensigle.inist.fr/ (accessed August 2014).
11. http://opensigle.inist.fr/handle/10068/697753 (accessed August 2014).
12. Sondergaard, T.F.; Andersen, J.; Hjorland, B. Documents and the communication of scientific and scholarly information. Revising and updating the UNISIST model. J. Doc. 2003, 59 (3), 278–320.
13. Schöpfel, J.; Stock, C.; Farace, D.J.; Frantzen, J. Citation analysis and grey literature: Stakeholders in the grey circuit. Grey J. 2005, 1 (1), 31–40.
14. Farace, D.J.; Frantzen, J.; Schöpfel, J.; Stock, C.; Boekhorst, A.K. Access to grey content: An analysis of grey literature based on citation and survey data. In Seventh International Conference on Grey Literature: Open Access to Grey Resources, GL7 Conference Proceedings, Nancy, France, December 5–6, 2005; Farace, D., Frantzen, J., Eds.; TextRelease: Amsterdam, 2006.

15. Ullah, M.F.; Kanwar, S.S.; Kumar, P. A quantitative analysis of citations of research reports published by National Institute of Hydrology, Rorkee. Ann. Libr. Inform. Stud. 2004, 51 (3), 108–115.
16. Artus, H.M. Old WWWine in New Bottles? Developments in electronic information and communication: Structural change and functional inertia. Grey J. 2005, 1 (1), 9–16.
17. Hey, T.; Trefethen, A.E. Cyberinfrastructure for e-Science. Science 2005, 308 (5723), 817–821.
18. Branin, J. Institutional repositories. In Encyclopedia of Library and Information Science. 2nd Ed., First Update Supplement; Drake, M., Ed.; New York: Taylor & Francis, 2005.
19. Simpson, P.; Hey, J.M.N. Institutional e-print repositories for research visibility. In Encyclopedia of Library and Information Science. 2nd Ed. (online only); Drake, M., Ed.; New York: Taylor & Francis, 2005.
20. ArXiv, An e-print service in the fields of physics, mathematics, non-linear science, computer science, and quantitative biology. http://arxiv.org (accessed August 2014).
21. Harnad, S. E-prints: Electronic preprints and postprints. In Encyclopedia of Library and Information Science. 2nd Ed., Drake, M., Ed.; New York: Marcel Dekker, 2003.
22. http://www.nyu.edu/socialwork/ip/ (accessed August 2014).
23. OpenDOAR, Directory of Open Access Repositories. http://www.opendoar.org (accessed August 2014). McMillan, G. Electronic these and dissertations. In Encyclopedia of Library and Information Science. 2nd Ed., Drake, M., Ed.; New York: Marcel Dekker, 2003.
24. Hanson, E.R.; Daily, J.E. Catalogs and cataloging. In Encyclopedia of Library and Information Science. 2nd Ed., Drake, M., Ed.; New York: Marcel Dekker, 2003.
25. Schöpfel, J.; Stock, C.; Henrot, N. From SIGLE to OpenSIGLE and beyond: An in-depth look at resource migration in the European context. In Eighth International Conference on Grey Literature: Harnessing the Power of Grey, GL8 Conference Proceedings, New Orleans, LA, December 4–5, 2006; Farace, D., Frantzen, J., Eds.; TextRelease: Amsterdam, 2007.
26. Greenberg, J. Metadata and the world wide web. In Encyclopedia of Library and Information Science. 2nd Ed., Drake, M.A., Ed.; New York: Marcel Dekker, 2003.
27. Jeffery, K.G.; Lopatenko, A.; Asserson, A. Comparative study of metadata for scientific information: The place of CERIF in CRISs and scientific repositories. In Current Research Information Systems, Proceedings of 6th International Conference CRIS, 2002; Adamczak, W., Nase, A., Eds.; University Press: Kassel, Germany, 2002.
28. TEI (The Text Encoding Initiative), http://www.tei-c.org (accessed August 2014).
29. Austen, G. Joint information systems committee. In Encyclopedia of Library and Information Science. 2nd Ed., Drake, M., Ed.; New York: Marcel Dekker, 2003.
30. GLISC Grey Literature International Steering Committee, Guidelines for the Production of Scientific and Technical Reports: How to Write and Distribute Grey Literature; Istituto Superiore di Sanità: Rome, Italy, 2007; http://www.glisc.info (accessed August 2014).
31. VanBuskirk, M.E.; Wallace, K.M. History of Canada Institute for Scientific and Technical Information (CISTI). In Encyclopedia of Library and Information Science. 2nd Ed. (online only); Drake, M., Ed.; New York: Taylor & Francis, 2005.
32. Boukacem-Zeghmouri, C.; Schöpfel, J. Document supply and open access: An international survey on grey literature. Interlend. Doc. Supply 2006, 34 (3), 96–104.
33. Schöpfel, J. MetaGrey Europe, A proposal in the aftermath of EAGLE-SIGLE. In Seventh International Conference on Grey Literature: Open Access to Grey Resources, GL7 Conference Proceedings, Nancy, France, December 5–6, 2005; Farace, D., Frantzen, J., Eds.; TextRelease: Amsterdam, 2006.
34. Mackenzie Owen, J.S. The expanding horizon of grey literature. In Third International Conference on Grey Literature: Perspectives on the Design and Transfer of Scientific and Technical Information, GL3 Conference Proceedings, Luxemburg, November 13–14, 1997; Commission of the European Communities DGTIMER: Luxemburg, 1997.
35. Roosendaal, H.E. Driving change in the research and HE information market. Learn. Publ. 2004, 17 (1), 1–6.

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[i] Schöpfel, J. Towards a Prague Definition of Grey Literature'. In *Twelfth International Conference on Grey Literature: Transparency in Grey Literature, GL12 Conference Proceedings, Prague, Czech Republic, December 6-7, 2010;* Farace, D., Frantzen, J., Eds.; TextRelease: Amsterdam, 2011. http://archivesic.ccsd.cnrs.fr/sic_00581570/fr/ (accessed August 2014).

[ii] http://www.greynet.org/membership/annualaward.html (accessed August 2014)

[iii] http://greyguide.isti.cnr.it/ (accessed August 2014)

[iv] Farace, D.J. Peering through the Review Process: Towards Transparency in Grey Literature. – In: The Grey Journal, Volume 7, Number 1, spring 2011. – p. 25-31. – ISSN 1574-1796.

[v] http://www.greynet.org/greysourceindex.html (accessed August 2014)

[vi] http://greyguide.isti.cnr.it/ (accessed August 2014).

[vii] www.greynet.org/greyforumseries.html (accessed August 2014).

[viii] www.greynet.org/researchandeducation/workshops.html (accessed August 2014).