

An International Journal on Grey Literature



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‘COLLECTIONS ON A GREY SCALE’

GreyNet

The Grey Journal

An International Journal on Grey Literature

COLOPHON

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About TGJ

The Grey Journal is a flagship journal for the grey literature community. It crosses continents, disciplines, and sectors both public and private. The Grey Journal not only deals with the topic of grey literature but also is itself a document type that is classified as grey literature. It is akin to other grey serial publications, such as conference proceedings, reports, working papers, etc.

The Grey Journal is geared to Colleges and Schools of Library and Information Studies, as well as, information professionals, who produce, publish, process, manage, disseminate, and use grey literature e.g. researchers, editors, librarians, documentalists, archivists, journalists, intermediaries, etc.

Grey Literature is defined as "information produced on all levels of government, academics, business and industry in electronic and print formats not controlled by commercial publishing *i.e. where publishing is not the primary activity of the producing body.*" (Luxembourg 1997; expanded in New York, 2004)

About GreyNet

The Grey Literature Network Service was founded in 1993. The goal of GreyNet is to facilitate dialog, research, and communication between persons and organizations in the field of grey literature. GreyNet further seeks to identify and distribute information on and about grey literature in networked environments. Its main activities include the International Conference Series on Grey Literature, the creation and maintenance of web-based resources, a moderated Listserv, The Grey Journal, etc.

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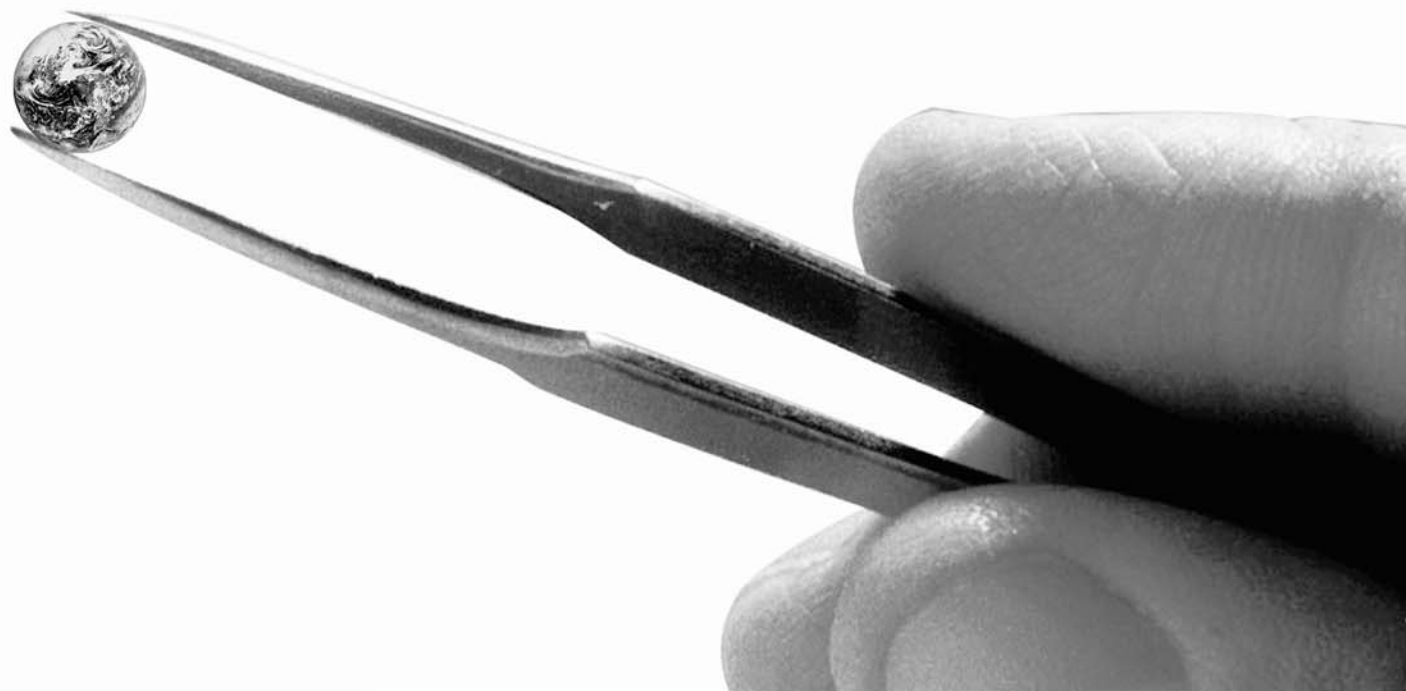
Libraries and repositories are best measured on the grey scale by the collections and e-publications they house. Likewise, the types of documents that embody grey literature are the easiest way to describe this expanding field of information.

Traditionally, reports were the mainstay of grey literature; however, a study carried out last year based on citation data indicates that report literature is rapidly losing its lead to other types of grey literature such as conference and web papers. As this trend in usage sets forth, the grey publishing industry has already shifted and is adjusting to new demands from information professionals and net-users.

In the first article, Schöpfel makes further observations on the future of grey literature. He sees the need for a new definition, and new economic model. His article is then followed by Gelfand's, which zooms in on the way grey literature is used in education sciences. Her emphasis on evidenced based teaching practices will ultimately influence library collections, whereby courseware platforms become more prevalent. In the two articles, which then follow, we see detailed case studies carried out. The first by Lambert, Matthews, and Jones on technical reports at CCLRC in the United Kingdom; and the second by Green on working papers at OECD in France. The final two articles in this issue examine challenges and prospects for grey literature collections. Ramos and Vogel focus on a special collection within an Aquarium's library, while Natarajan deals with collection development in e-environments pertaining more or less to developing countries.

After reading this selection of articles you may come to agree that the grey scale, whether seen as an instrument or a measurement, must in either case accommodate a variety of document types as well as organisational structures.

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Observations on the Future of Grey Literature *

Joachim Schöpfel (France)

Abstract

The article provides an overview on the definition and evolution of grey literature (GL) in the emerging environment of online resources and open access to scientific and technical information. First, it gives some empirical evidence on the importance of GL in scientific publications from different domains, especially education, based on citation analysis. Other topics: the impact of Internet on the production of GL, the place of grey resources in open archives and institutional repositories, the development of bibliographic control and standardization of GL and the difficulties of identification and accessing of grey documents. The article ends with some prognostics on the future of GL and open questions for research in library and information sciences on GL.

Landmarks

Cartographers everywhere, even those who map the archipelagos of knowledge (Baltz, 2003), need a few landmarks to guide their sketches and explorations. There are several definitions of grey literature, the most common being the so-called 'Luxemburg definition', which was discussed and approved during the 3rd 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".

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. The Luxemburg definition is also vague enough to reflect the problem of determining exactly what a type of literature variously described as «underground», «ephemeral» or «non-conventional» really means. To quote two experts from the British Library, "grey literature is difficult to define" (Wood and Smith, 1993).

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 catalogues and databases, so that searches through this category of scientific information requires specialised knowledge on sources and circuits – as evidenced by the "Observatory on theses in education sciences" (*Observatoire des thèses concernant l'éducation*) hosted by the INRP¹.

Information professionals – including archivists, librarians, researchers and teachers – have been contributing to studies on grey literature for nearly 30 years now, compiling a rich corpus of articles and, since 1993, international conference papers on grey literature². In 1985, several European countries founded the EAGLE association to identify and disseminate grey literature. In the 1990s, governmental initiatives in France (see Comberousse, 1995 and Desmichel, 1998) resulted in particular in the establishment of two national "one-stop shops" for accessing reports (La Documentation Française and INIST-CNRS). Other countries have designated "deposit

* Based on an article first published in French in *Perspectives Documentaires en Education* 2006, n° 62.

and distribution centres" (such as the British Library for the UK) or established portals for scientific reports (such as GrayLit for US Federal Agencies).

Rather than attempting to summarise the full range of this abundant literature, our study offers observations on its importance and how it is evolving in the digital environment. We also include comments on the problem of descriptive referencing and distribution, to conclude with a series of open questions.

On the (relative) importance of grey literature

Grey literature has a role of its own as a means of distributing scientific and technical information (see Sondergaard et al., 2003), 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 (see Wood and Smith, 1993).

But how do researchers actually use grey literature? One way of evaluating this is to analyse the citations given in their publications. In order to obtain a statistical evaluation, we used two different sources: a Franco-Dutch study launched in 2004 and the INRP journal *Perspectives Documentaires en Education*.

Scientometric studies (citation analyses)

We look first at some results from the Franco-Dutch study (Schöpfel et al. 2005, Farace et al. 2006), which analysed 64 scientometric articles published between 1987 and 2005 and citing several thousands references altogether. The table below shows the proportion of grey literature cited in publications from different scientific disciplines:

Table 1: Proportions of grey literature cited in scientific publications

Field	Grey literature citations
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%

These analyses show that 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.

In particular, public administrations and public and industrial research laboratories produce a great deal of "grey" material, often for internal or "restricted" dissemination (see Ullah et al., 2004, for example).

The journal *Perspectives Documentaires en Education* (case study)

For a more accurate idea of the way grey literature is used in education sciences, we analysed several recently published articles from the INRP journal *Perspectives Documentaires en Education*. The results vary widely.

We looked first at four studies published in 2003 in issue n° 59, quoting 372 bibliographic references altogether. The proportion of citations referring to "grey" documents varied from 12% (Lüdke 2003) to 37% (Duarte 2003) to 45% (Landesmann 2003) to 56% (Ndoye 2003). The latter – an overview on research on school performance in Africa – is symptomatic: the majority of the sources used by Ndoye are documents produced by national or international bodies (ministries, universities, UN, World Bank etc.), which have never been distributed commercially and, three years later, have probably become very difficult to find and obtain.

In another example, Auricombe (2001), in his study on information retrieval and usage in education sciences, highlights the importance of grey literature, from which 21% of his own references are taken.

Finally, we analysed the different studies and notes in issue n° 60 of *Perspectives Documentaires en Education* (2003). 15 of the 198 sources quoted by the authors (= 7%) refer to conferences, seminars, legal texts and doctoral theses. The other citations, such as those in the same issue's "current bibliography", refer to books and journal articles.

A comparison was made with two studies in education sciences published in other journals: Okiy (2003), analysing 4012 references to 70 theses submitted in Nigeria, found that 14% of the sources were from grey literature (theses, reports, conferences, etc.). An analysis of 1842 references from US theses (Beile et al., 2004) produced a figure of over 19% of "grey" document sources.

To sum up, the relative proportion of grey literature in scientific information varies widely with scientific fields but also with subjects, methodologies and even geographic origin. Grey literature plays a considerable part in the education sciences, accounting on average for 10-20% of all sources used.³

TYPOLOGY: FROM paper TO DIGITAL

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. SIGLE, the European database of grey literature, has been supplied since the 1980s with information from organisations in several EU countries. Its more than 800,000 references are distributed as follows:

Table 2: Distribution of different document types in the SIGLE database

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

Reports are the most numerous by far among the different types of grey literature. 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 long.

In the other categories, scientometric studies (see Farace et al., 2006) offer a tremendous range of grey resources: besides theses and conference proceedings, they also include unpublished manuscripts, newsletters, recommendations and standards, patents, technical notes, data and statistics, presentations, personal communications, working papers, laboratory research books, preprints, academic courseware, lecture notes, and so on.

However diverse, these documents all have one point 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, a real problem for scientific communication.

However, the Internet is now changing the whole picture. Not only because of changing user behaviour (see for example a recent study by Le Roux, 2005, on document specialists in the teaching professions), but also, and especially, because more and more grey literature is being published on the Web. Even so, as a study from the German centre for information in the social sciences has pointed out (Artus, 2005), the emergence of a new medium for publications does not necessarily mean that more grey literature is appearing. But although the switch from paper to digital has not increased the number of publications, it has radically changed access and distribution methods and, especially, accentuated the ephemeral and volatile nature of grey literature.

From preprints To Open Archives

There is no need here to describe the movement towards open access to scientific information, which has been crystallising since 1994 around various initiatives to promote open archives. For an introduction to the topic, we refer French-speaking readers to a number of recent resources (Chanier, 2004, Fily, 2005, Aubry and Janik, 2005, a guide to the URFIST Paris site by A. Mahé⁴, or the INIST current awareness site⁵).

The case of the first preprint server, ArXiv, set up by P. Ginsparg at Los Alamos in 1991, is nonetheless of interest for the purposes of this study⁶. This was a means for distributing research results organised by and for physicists, with no intermediaries, which was entirely independent from any commercial circuit for scientific publications. In this sense, the server (which contains over 350,000 documents today) corresponded exactly to the definition of grey literature.

However, the case is more complex than that. "Preprints" would not have existed without "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 was not to bring commercial publishing into question, since Ginsparg did not offer any alternative to the peer review system, which was 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 organisation of the nuclear physics community.

The creation of the first open archive within the CNRS⁷ in 1998, by Franck Laloë, a physicist with the Paris Ecole Normale Supérieure, obeyed a broadly similar logic⁸, advocating direct, fast, free scientific communication between researchers in the same field.

But the crisis that has hit scientific journals (see Chartron, 2002 and Keller, 2001) and the appropriation of the new technologies of information and communication by information professionals have helped to turn the new means of distribution into an alternative model of scientific publishing. In France, the CCSD's HAL⁹ is fast becoming the main countrywide institutional archive. This has two objectives:

- Economic: to offer a cheaper alternative to scientific publications by exercising increasing pressure on STM publishers.

- Administrative: to facilitate control over scientific production from the various research organisations and universities by identifying and evaluating publications via a central database.

Given the methodological and hermeneutic diversity of the different scientific communities, one may well wonder whether a system that has operated for 15 years in physics will be equally effective in other fields, especially in view of the "constraints induced by research evaluation methods" (see Prévot, 2005, on the subject of Earth Sciences).

What is the part played by grey literature in this new environment? The first international 'Directory of Open Access Repositories' (OpenDOAR), established by the Universities of Nottingham and Lund¹⁰, identifies 349 different sites, including 20 in France (February 2006). OpenDOAR indexes 12 categories of grey literature, including reports, theses, conference proceedings and preprints, but also working papers, learning objects (especially university lectures), PowerPoint presentations and student theses and research results ('data sets'). The directory does not allow archive searches, so that there is no way of obtaining an exact figure for the numbers of documents involved. The table below therefore only shows the number of open archives that contain certain categories of grey literature:

Table 3 : Presence of different document types in the OpenDOAR archives

Document types	Number of archives	% of OpenDOAR sites
Theses	211	60%
Reports	146	42%
Conferences	146	42%
Preprints	89	26%
Student theses	72	21%
Working papers	66	19%

At first sight, these figures seem to suggest that grey literature is relatively well represented in open archives. 60% of recently identified sites contain doctoral theses, and over 40% of open archives contain conference proceedings and reports. However, the picture becomes less clear with an analysis of archive descriptions, which shows that the number of sites explicitly dedicated to grey literature is much smaller: only 45 sites are identified for doctoral theses (13%), 30 for reports (9%) and just 8 for conference proceedings (2%). Observations made at the 7th 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 changed the situation of grey literature to any great extent.

We conclude this section with a few remarks on the situation in France. Even though 9 archives, including HAL, contain conference proceedings, these are referenced at the same level as articles (individual communications) without any specific search functions for this type of information (grouping by conference, etc.). The same is true for reports: although a number of archives, especially institutional ones (IFREMER, Institut Jean Nicod, MSH-Alpes), obviously contain reports, as far as we know there is only one project (LARA, run by INIST-CNRS, based on DSpace) that has been developed exclusively as a repository for scientific and technical reports (see Stock et al., 2006).

The situation is different for doctoral theses where more advances have been made. This is probably due to three factors: the international environment (NTLTD, ETD conferences), the national ABES¹¹ system (SUDOC¹², the STAR project) and the importance of doctoral theses (see Le Hénaff and Thiolon, 2005). Nevertheless, the situation in France is still characterised by the heterogeneity of institutional, thematic and thesis archives (e.g. Cyberthèses, PASTEL, TEL), which together account for only

a small proportion of national production (see Paillassard et al., 2005). Although this situation is unsatisfactory in comparison with other countries, it will undoubtedly evolve in the coming months towards more systematic identification and deposits of French doctoral theses in electronic format, through the ABES and CCSD sites.

Improving "Bibliographic Control"

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

The way the different types of grey literature are referenced still depends more on choices made by the bodies that produce, collect or distribute these documents than on any national or international standard (ISO, ISBD, AFNOR¹³ etc.). The failure of the international report numbering standard (ISRN) is symptomatic in this respect - having been the only country with an active ISRN agency (INIST) for several years, France eventually had to agree to the ISO abandoning the standard. The only remaining exception in France concerns doctoral theses submitted to French universities, for which the Téléthèses database and, later, SUDOC cataloguing, imposed a uniform bibliographic format.

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

The rapid development of the Internet and its ever-multiplying on-line resources is affecting bibliographic control in two ways (see Artus, 2005). On the one hand, such "wild growth" is speeding a decline in the application of formal and qualitative standards, with the risk of grey literature becoming "even more greyish". On the other hand, the same risk has also boosted awareness, in all countries, of the need to define a few minimal data - called metadata - to provide a framework for referencing digital documents.

Examples include: a project aiming to adapt the Dublin Core to reports (Jeffery et al., 2002) or doctoral theses; the French "Thèses Electroniques Françaises" (TEF) initiative, which is working on a set of metadata and a single XML schema¹⁴, the "Text Encoding Initiative" (TEI)¹⁵ designed to develop and recommend, at international level, common tagging standards that are independent from IT upgrades, and the creation in 2005 by the CNRS and INRIA¹⁶ of a TEI support centre for Europe located in Nancy, which will probably 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 the JISC in the UK set up a committee in early 2006 to look into the interoperability of these archives and to describe their resources in order to facilitate their identification by end-users.

One final example: after the 7th international conference on grey literature in 2005, P. de Castro and S. Salinetti from the Istituto Superiore di Sanità in Rome initiated an international committee on grey literature which would develop recommendations (the "Nancy Style") for the production and distribution of scientific and technical reports. The first version of the document is now published on the Web¹⁷ (GLISC, 2006), and translations into French and Italian are under way.

This example is symptomatic in some ways of the problem of bibliographic control of grey literature. This 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. And because there are no commercial issues at stake, improved referencing will always be dependent on the initiatives and willingness of producer or distributor organisations and a few committed professionals.

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 the reports, studies, conference proceedings and doctoral theses cited by Ndoye (2003) or Landesmann (2003) in issue n° 59 of *Perspectives Documentaires en Education...*

For 20 years, the SIGLE database offered a solution at EU level, insofar as its partner organisations 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, catalogues and databases, which makes searches for "grey" information not only painstaking but sometimes prohibitive as well, not to mention the linguistic difficulties involved.

In view of the rapidly changing face of STI within the digital environment, all the major traditional centres collecting and distributing grey literature, such as the British Library, the Canadian Institute for Scientific and Technical Information, the TIB in Hanover or INIST, have begun to develop free access services to these documents, especially for theses and preprints, but also for reports and so on (see Boukacem-Zeghmouri and Schöpfel, 2006).

However, there is still a notable absence – at least at national and European levels – of portals and search tools that are specifically dedicated to "grey" documents. Even Elsevier have started to index doctoral theses in electronic format in their *Scirus* search engine. The initiative from members of the EAGLE association to launch a metasearch engine dedicated to European grey literature collections is still in the draft stage (see Schöpfel, 2006). Meanwhile, users have no other choice but to conduct searches individually using whatever means they have to hand, or to keep using the search services provided by traditional organisations (in France, university libraries and INIST).

The future of Grey Literature

Grey literature will remain a challenge for information and documentation professionals as well as an interesting field for research and activity, in five areas at least (see Stock et Schöpfel, 2004):

The need for a new definition: The traditional definition of grey literature needs to be refined and supplemented through an accurate analysis of new means of access and distribution, in line with Mackenzie Owen's observation (1997) that "Grey does not imply any qualification (but) is merely a characterization of the distribution mode".

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 article or book searches. To date, there is no economic model in this area and analysis is much needed in terms of investments, direct and indirect costs, acquisition prices and so on.

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

The need for a new 'value chain': In the last few years, in the Netherlands, Rosendaal (2004) has been researching the process whereby universities have been reappropriating publications, and highlights the radical changes affecting the 'value chain' of scientific publications. Evaluations of scientific publications and their quality are set to become major issues in the context of emerging STI trends. The impact of new technologies of information and communication on non-commercial circuits is a complex matter that has been little analysed to date – and the potential field for research is vast.

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. The legal environment in France and internationally is evolving rapidly, and no documentary analyses have so far addressed the legal aspects and economic issues at stake in the field of grey literature.

To conclude, we offer some prognoses for further reflection.

It seems certain that:

- Grey literature will not disappear, but will continue to play a part alongside commercial publishing.
- The borderline between "grey" and "white" (commercial) literature will become increasingly indistinct, particularly in an environment that is moving towards free access to STI.
- The proportion of "grey" documents published on the Web will increase rapidly.
- The Internet will encourage greater diversity in "grey" resources (raw research results, notes and personal comments, lectures, etc.).

It seems likely that:

- Bibliographic control of grey literature will remain problematic despite the trend towards standardisation of digital documents.
- Open archives will offer more appropriate services and functions for some segments of grey literature, not only for preprints but also for doctoral theses and reports .
- Some organisations – especially public bodies but also in the private sector (Elsevier, Google, etc.) – will develop tools and services to aid more efficient exploitation of "grey" resources on the Web.

It seems unlikely that:

- Searching and collecting grey literature will become as easy as for journals and books from the traditional publishing sector.
- The new tools for collecting, depositing and archiving will make grey literature less ephemeral and volatile than in the past.

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- ¹ INRP: French National Institute on Research in Education Sciences, see <http://www.inrp.fr>
- ² <http://www.textrelease.com>
- ³ By way of note to the reader, this present study contains 30% "grey" references.
- ⁴ <http://www.ext.umpc.fr/urfist/ArchiveOuverte/OA.html>
- ⁵ <http://www.inist.fr/openaccess>
- ⁶ <http://arxiv.org>
- ⁷ French National Research Organisation, see <http://www.cnrs.fr>
- ⁸ <http://ccsd.cnrs.fr>
- ⁹ CNRS Centre for Direct Scientific Communication, see <http://ccsd.cnrs.fr>
- ¹⁰ <http://www.opendoar.org>
- ¹¹ Operating agent of the French academic union catalogue and ILL system, see <http://www.abes.fr>
- ¹² French academic union catalogue, see <http://www.sudoc.abes.fr>
- ¹³ French Standard Organisation, see <http://www.afnor.fr>
- ¹⁴ <http://www.abes.fr/abes/documents/tef/index/html>
- ¹⁵ <http://www.tei-c.org>
- ¹⁶ French national institute for research in computer science and control, see <http://www.inria.fr>
- ¹⁷ <http://www.glisc.info>

Challenges for Collections in New Collaborative Teaching and Learning Environments: Does Grey Literature Fill a Void? *

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Abstract

Academic institutions around the globe are introducing and launching bold new teaching initiatives that utilize technologies in the classroom and for remote teaching. The emphasis on distance learning is but one example of this. However, the focus of this paper is to explore the collaborative nature of teaching, learning and studying where faculty and students have to be aware of access to information and the new course management and bibliographic software options to share information while promoting collaborative and group work. The disciplines of business/management and engineering were at the forefront of such work. But, the increasing use of evidence-based management, project design, and case studies common in medicine and other applied fields suggests that more changes in classroom teaching styles are forthcoming. This paper suggests that information needs may be more complex in the future. Grey literature and content found in nontraditional collections such as in repositories, in databases and on courseware platforms will be more prevalent. Influencing commercial products in this direction is common but organizing library collections to lend to such a variety of teaching practices will be an ongoing challenge in a more technology focused learning environment where teaching and learning is done in small groups.

Two primary case studies will be used to demonstrate how faculty are relying differently on content in classroom teaching. One, a medical informatics course, will be described where evidence-based principles are the foundation and how post-graduate medical students use information resources to manage a patient-care case; and the second example will be an undergraduate engineering project design course, where students have to research, plan, design and construct a product. In both of these examples collaborative group work is the teaching method.

The conclusions of this paper will demonstrate that technology is what lends to a collaborative course having a theory, research, writing and evaluation component and where students must form teams or groups. The information needs that are now required include the ability to integrate technology to research, capture, evaluate, document, present, and archive the process of the course and to create the product or final assignment. Utilizing resources such as grey literature contribute to the successes of these case studies.

From the preface of *Everything and Nothing: Deconstructing Evidence-Based Practice*, the late critic and philosopher, Jacques Derrida, writes, "Here is what I wrote, then read, and what I am writing that you are going to read. After which you will again be able to take possession of this preface which in sum you have not yet begun to read, even though, once having read it, you will already have anticipated everything that follows and thus you might just as well dispense with reading the rest."¹ This sets my stage.

Introduction

A recent article in the *Chronicle of Higher Education* by market researcher Daniel Yankelovich entitled "Ferment and Change: Higher Education in 2015" offers his speculation about what higher education will look like a decade from now. He identifies five trends, which he qualifies "will radically transform higher education in the coming years." Those trends, converging with one another are pressure points for institutions of higher learning. He concludes that if taken seriously and together they pose an enormous challenge that if neglected, will mean serious trouble for higher education and the United States."² These trends I surmise have great global

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relevance and consequences not only for the US but generations of students worldwide. They are:

1. Changing life cycles as our nation's population ages
2. America's growing vulnerability in science and technology
3. The need to understand other cultures and languages
4. Increasing challenges to higher education's commitment to social mobility
5. Public support for other ways of knowing³

Compounding these challenges is the mystery of what strategy will be employed to remedy the landscape and suggest some productive resolutions and whether we are equipped to assess when progress has been made in each of these areas. There is not a university or academic institution with which I am familiar that is not in the throes of self-examination - how to make a college education more relevant and prepare a generation of leaders in a wide range of fields in this complex era of extremes - the haves and have nots, the digital divide, the social, political, religious and economic pandemics facing the world.

Richard Hersh, Senior Fellow at the Council for Aid to Education, Co-Director of the Collegiate Learning Assessment Project, and a former president of several liberal arts colleges in the U.S., writing in last month's *Atlantic Monthly* tries to answer the question, "What Does College Teach?" and suggests how "higher education is the only industry in which competitors are rated on the caliber of their customers rather than on their product... because we don't have any other way to measure collegiate quality."⁴ Rankings and surveys hardly get to the real question of impact of one's education, but those that ask students to assess their experiences appear more promising according to Hersh. Assessment remains the buzzword among those that study different aspects of higher education and the emphasis that is universally accepted includes how students should master the following skills:

- Weigh, organize and synthesize evidence from different sources
- Distinguish rational from emotional arguments; facts from opinion
- Analyze data
- Deal with inadequate, ambiguous or conflicting information
- Spot deception and holes in the arguments of others
- Recognize what information is or is not relevant to the task at hand
- Identify additional information that might help to resolve issues⁵

This reinforces how strong sentiments are that articulation, presentation, computation, analytical and research skills are critical in defining a well educated individual. "If higher education is to take the lead in innovation, and to define, seek and demand excellence from its students, today's academic should be satisfied with nothing less"⁶ concludes Hersh.

Thus, the motivation of this paper is to explore more effective ways to teach using new techniques and resources while engaging in a new collaboration with and between students. In the academic library environment information literacy is the umbrella of such goals. This strategy encourages librarians to participate and partner with faculty to incorporate informatics in the core curriculum. How to find, manipulate, evaluate and apply relevant information is the essence. The Association of College and Research Libraries (ACRL) has defined Information Literacy as

The set of skills needed to find, retrieve, analyze, and use information. Information literacy is more closely tied to course-integrated instruction but it extends far beyond coordination between the reference librarian and the individual faculty member. Even a cursory review of the Information Literacy Competency Standards (link) will show that there is much more to information literacy competence than library-related research. Students must demonstrate competencies in formulating research questions and in their ability to use information as well as an understanding of ethical and legal issues surrounding information. This requires a campus culture of collaboration and focus on student learning.⁷

Addressing the problem

Librarians are engaged in directing users to appropriate resources, and teaching how to use them, but they are also involved in the content management of that intellectual property, by explaining best practices of scholarly communication, distinguishing copying from interpreting, and how to cite, organize and recall information, using new software such as bibliographic management software (EndNote, RefWorks are such examples) and the utility of course management platforms used not only in distance education but for group projects, collaboration,

team teaching, integrated learning, multimedia, etc (WebCT, Blackboard and hosts of other products and local systems are in this marketplace).

Evidence-Based Practice

Still the effort remains most fuzzy and distorted when we examine pedagogy, teaching styles and learning behaviors and outcomes. Recently, medical education at my institution and throughout the world has explored how evidenced-based principles (EBP) can advance the teaching process in clinical fields like nursing, public health/epidemiology, mental health, medicine and now social services and welfare and we are also seeing it applied in business and management curriculum, criminal justice and law enforcement. This author is trying to pioneer some applications in engineering design and project management curriculum where she sees enormous utility of EBP. It also has application in the daily practice of consumerism and how we evaluate products and services we need, acquire or lease. Once called, research-enhanced clinical care, Evidence-based medicine is the coined phrase known as EBM and it builds on a tool-kit dependency of core resources and how to know when it is appropriate to use them.

We can't forget the famous quotes from the late Carl Sagan, "If we did not respect the evidence, we would have very little leverage in our quest for truth" and "Absence of evidence is not evidence of absence." In EBP, learning objectives are defined and influenced by best evidence available in the decision-making process using the expertise, values and preferences of the individual or patient in medical settings, their families and the communities who are served and thus culled from available resources. Evidence-based care involves the integration of best research evidence with clinical expertise and patient values. This "holistic" approach of bringing together all the component parts is the centrality of evidence-based practice and involves attitudes, skills and behaviors and suggests how organic and fluid it is as new evidence presents itself. An example of why this method exists can be illustrated by those professionals who think that a patient who consults for or seeks services and deserves it - "they have an ethical and often a legal right to know the answers to such questions as 'what evidence is there that this treatment will help me?' What is the cause of my illness or situation,' and only a transparent process that equips patients and practitioners with powerful tools to address important questions of therapy, prognosis, diagnosis and etiology."⁸ Again, it builds on being able to argue the case, explain it cogently to everyone who needs to know, summarize it for the medical file and demands use of resources to support specific values.

Many proponents of EBP suggest that the practice allows for better management of the proliferating literature in nearly every field, while the human side of medicine is also emphasized, such as the compassion, understanding, personal choice factors and gains more attention in the overall delivery of service. Consistent rationale for why EBP is valuable is well summarized as:

- Ethically - what will help me feel better
- Allows decision process to become more transparent
- Offers useful tools to clinicians and patients
- Helps to identify a lack of resources
- Highlights gaps in knowledge
- Enables all parties to get the best from a huge amount of information
- Identifies the variability in health care⁹

There are also some weaknesses in EBM and they may include a cultural bias, or focus on traditional drugs versus more alternative forms of treatment, therapy or medicine, and publication bias can be rather strong where previous results are not fully reflective of true samples and experiences. Without dwelling on how it may be dysfunctional as a practice, the evolution of EBP has been described as having five essential steps in its practice:

- Convert information needs into answerable questions
- Track down, with maximum efficiency, the best evidence with which to answer them
- Critically appraise that evidence performance for its validity and usefulness
- Apply results of the appraisal in clinical practice
- Evaluate performance¹⁰

What stands out, as a unique feature in EBP is that it requires that a systematic literature search be conducted and thus enhances the accountability to stakeholders. The key elements that resurface in nearly all scholarship in EBP are intensive and defined as methods for:

- Finding Research Resources
- Accessing Research
- Appraising Research
- Applying Research

The background questions which set the stage for the interactions are answered by using "background" resources such as textbooks, web resources and narrative reviews. In addition they can be divided into two types of clinical questions, the Background and Foreground. The latter are more specific, focused and complex and tend to be answered by consulting primary and secondary sources and contains the PICO elements for structure:

P = Patient/Population/Problem/Situation

I = Intervention (treatment of method)

C = Comparison (alternatives)

O = Outcome interest

The Collection: Introducing Grey Literature

By refining the literature search and interview questions with patient subject one achieves a hierarchy of types and levels of evidence to reflect:

- Meta-Analysis
- Systematic Review
- Randomized Controlled Trial
- Cohort Studies
- Case Control Studies
- Case Series/ Case Reports
- Basic Laboratory and Animal Research

By completing an exercise that converts the patient/provider interview into PICO format and identifies search concepts, one can then evaluate the online resources with traditional criteria:

- Who operates the site?
- Who supports or pays for the site?
- What is the purpose of the site?
- Where does the information come from?
- What is the basis of the information?
- How and on what basis is the information selected?
- How current is the information?
- How does the site choose links to other sites?
- What information about the user does the site collect and why?
- How does the site manage interactions with visitors?

The EBP competencies conclude that:

- Sufficient research must have been published on the specific topic
- Provider must have sufficient skill in access and critically analyzing research

Changes in treatment plan are made due to evidence-based experience.

The teaching skills that are critical include achieving a productive interview, the balance between listening and talking has to be right. Getting sufficient information to complete the PICO is the objective. Getting it right, efficiently is the aim and is usually achieved by strong relationship building skills, establishing a high level of trust and perfecting questioning skills and mastering the critical thinking process which has the following components:

- Problem identification and analysis
- Clarification of meaning
- Gathering the evidence
- Assessing the evidence
- Inferring conclusions
- Other considerations
- Overall judgment¹¹

Depending on the subject matter and the traditions of the corresponding literature, one can sense the value of evidence-based practices. For example, in a subject where the literature leads one to a benefit that is not so individually-based or case management focused such as in the provider/patient relationship but may be more community-intensive, such as in public health, epidemiology, problem-solving,

corrections, or engineering, dealing with solutions to problems in aerodynamics, new product development, seismic ratings, etc. The interventions may include:

- Policies of governments and non-government organizations
- Laws and regulations
- Organizational development initiatives
- Community development initiatives
- Education of individuals and communities
- Engineering and technical developments for re-engineering
- Service development and delivery
- Communication, including social marketing¹²

The medical education component, obviously more mature has a corresponding set of resources to accompany parties to conduct information seeking, appraisal and application. These tools form the tool-kit in medical libraries that is now increasingly extensive and reflects the expensive compilation and packaging of a range of products such as:

- Reference source-books (MedlinePlus),
- Textbooks
- Empirical studies, journal literature databases (PubMed, etc)
- Systematic review literature (Cochrane Library)
- Drug and clinical studies (PubMed Clinical Queries, UpToDate, Natural Medicines Comprehensive Database, eMedicine Database, TRIP Plus - Turning Research into Practice), InfoPOEMS/InfoRetriever, GIDEON
- Specific resources from different specialties like nursing, etc), and research (Joanna Briggs Institute Reports, etc)
- Grey literature - the more non-traditional, alternative sources although they are increasingly mainstream today in most treatment plans
- New products just being rolled out, like EBSCO's Evidence-Based Complementary Medicine (EBCM) database to be launched in May 2006.

In engineering and design disciplines, finding the best evidence available is more difficult because the resources are not yet produced with this strategy in mind. Engineers are very logical and rely heavily on their corpus of content that looks at data and may include, maps, field sample data in civil engineering, patents, handbooks, standards, dissertations, ergonomics and safety issues, and other government focused collections of innovation and intellectual capital, a range of materials - polymers, concrete, steel, ceramics, glass, etc where the physical sciences of chemistry, physics and mathematics influence relevance. Engineers are often on the prowl for unpublished information and will look at materials on the web, created by or contributed to by competitors often before they seek out traditional library-held resources, even though they rely upon key reference sources, formularies, handbook series, etc., all not surprisingly available online today. Increasingly, scholarly communication practices has influenced this as engineers have followed high-energy physicists in creating pre and post print archives, using the conference proceeding as a primary source and showing commitments to institutional repositories by depositing a range of materials. Still, there remains the hesitation to do so before exploring possibilities for intellectual transfer and potential for patents or new submissions and revisions of standards.

Collaboration in engineering has also been the norm far longer, as laboratories are larger requiring more people and the commitment to interdisciplinarity has never been more evident. Teams of different kinds of engineers work together in both academic and industry research centers and now the computer science /IT nucleus is even more integrated in the research process as technology leads the way. Also, both medical/clinical and engineering professionals are relying upon the business and economics literature to chart progress of new products, innovation, market share penetration, and other distribution channels to position themselves for post-discovery success based on demographic patterns. New forms of publishing including interactive media, blogs and wikis suggest the need for more intense evaluation in assessing quality and finding best evidence. Engineers also like current awareness services such as customizing personal "@mylibrary" pages and subscribing to RSS feeds.

In the engineering sector, more of an emphasis is on re-engineering, or refining products. The burgeoning field of biomedical engineering promotes that as newer technologies influence new procedures, products and innovation. The role of the laser is a good example, and there are hosts of others - making surgeries less invasive, products and processes more comfortable like for dialysis and transplants, and the

computer storage capacity has become more affordable for large genetic and biological computing needs to handle DNA banks, visualization, etc.

Students in engineering project design come prepared to test, push limits and see

their creative spirit demonstrate potential for entrepreneurship. However, learning and teaching evidence-based technique has not always been easy. Advanced and nonplussed by technology, young engineers are ambitious but not always focused on the mechanics of conducting a literature review. The "will try, can fix and will do" mentality more accurately describes the priorities over posing questions and finding sufficient evidence. However, when done, the package, product and research process appears more complete and provides a high degree of satisfaction and a record of the process. It proves that a lot of consultation took place and interaction with peers, specialists and advisors. For example, feedback is given by faculty and peers to a business plan. The strength of evidence as tested in clinical settings has more relevance today in the applied sciences and technology than one can imagine. This can be summarized by the Five Strengths of Evidence:

- I Strong evidence from at least one systematic review of multiple well-designed randomized controlled trials
- II Strong evidence from at least one properly designed randomized controlled trial of appropriate size
- III Evidence from well-designed trials without randomization, single group pre-post, cohort, time series or matched case-control studies
- IV Evidence from well-designed non-experimental studies from more than one center or research group
- V Opinions of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees.¹³

Back to Instruction - Conclusions about Grey Literature

Technology drives the current teaching environment. Evidence-based practices in whatever discipline offer a theoretical framework that reaffirms a strategy or process to follow. It includes a strong research and evaluation component and due to the proliferation of information in all formats new information products that are created with evidence-based principles as their structure are available to help make the process easier. Finding the best evidence and evaluating information with a higher degree of confidence suggests how important evidence-based collaboration can be in the instruction and research environments in clinical and applied disciplines.

Grey Literature does fill a void when one examines the range of sources consulted to achieve successful evidence-based practices - one needs to utilize the nontraditional resources in many cases to substantiate best practices. The sheer number of resources one finds by entering a search of evidenced-based + grey literature supports this beyond observation. One of the most comprehensive websites containing the range of grey literature within an evidence-based context can be examined at the University of Calgary Health Sciences Library (<http://library.ucalgary.ca/brancehes/hsl-greyliterature/index.php?>) and the work done in software engineering and evidence-based applications by Barbara Kitchenham at the University of Keele (<http://ease.cs.keele.ac.uk/keys2005.html>) shows an impressive launch in this subject area. Bibliographies and web searching supports many more creative ways of introducing evidence-based practices.

Evidence based practice encourages being conversant with information architecture. It promotes how engineers with this familiarity can influence and redesign e-commerce, continue to actively play in the world of personalized media and create sophisticated new retail and living environments. I imagine that teaching tools in EBP are becoming more available and distance education is currently contributing to the need for them.

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Publications Office

Grey Literature, institutional repositories, and the organisational context *

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Abstract

A wide variety of grey literature is produced during the work carried out at a large multidisciplinary scientific research organisation. This paper examines how the grey literature may be managed and the benefits that result. Trends in Technical Reports, which have always been an important medium for transmission of knowledge, are examined, and the use of an institutional repository is advocated for the future of the medium. Other kinds of grey literature produced in research projects are also described, and again the institutional repository is seen as an important mechanism for preserving and making accessible the knowledge they embody, particularly if it is coupled with other information systems in the organisation.

Introduction

CCLRC, the Council for the Central Laboratory of the Research Councils, is one of Europe's largest multidisciplinary research organisations supporting scientists and engineers world-wide. As well as participating in setting the priorities for the UK's science needs, it operates three research laboratories: the Chilbolton Observatory in Hampshire, the Daresbury Laboratory (DL) in Cheshire and the Rutherford Appleton Laboratory (RAL) in Oxfordshire, and employs 1800 people. These laboratories offer facilities and expertise including ISIS, the world's most powerful-pulsed neutron source; high-power lasers; space science technology including satellite and ground-based instrumentation; and information technology.

The operation and development of CCLRC's facilities—which set the organisation apart from most universities—require a high level of specialised knowledge and expertise that has been built up over many years. Additionally, members of staff and users of the facilities conduct research. Collaborative projects are undertaken, sometimes of a very large scale: for example, the Space Science and Technology Department was strongly involved in the Mars Express and Venus Express planetary missions. In information technology, there is a history of many years of international collaboration in European research and development projects, involving partners (companies, research institutes and universities) in many countries and producing software, standards and academic publications.

It can be seen that CCLRC is a knowledge-intensive organisation with some special attributes and requirements. Grey literature, as well as literature for publication, plays a key role in its business, and this paper will study that role, link it to the context in which the business is conducted, and highlight the importance of CCLRC's institutional repository in supporting it.

Technical reports as grey literature

CCLRC and its predecessors have produced Technical Reports since the organisation was founded. These are formally published by the organisation and are deposited, according to UK law, with the National Deposit Libraries. The format was designed to capture the pre-refereed version of journal articles or to capture technical details for posterity and dissemination. The first point was especially relevant for particle physicists, as rapid dissemination of information was, and still is, important to advance the boundaries of the field. The second is a recognition that not all the knowledge gained from the scientific process is suitable for publishing in the scientific journal record but is still valuable. As one of CCLRC's main roles is the building and maintenance of large-scale scientific facilities, the organisation has detailed technical knowledge in very specialised fields. Building these facilities does not happen very often, but for example information contained in technical reports for the Neutron Spallation Source (ISIS) are being used twenty years later to aid the construction of a Second Target Station.

* First published in the GL7 Conference Proceedings, January 2006

However both these roles have been affected by the changes in information dissemination that have occurred with the rise of the Internet. Pre-refereed paper versions have been completely overtaken by e-print repositories (such as arXiv¹) and the print form is now redundant. Furthermore, the internal processes for producing technical reports have been a barrier in this electronic age and the format has been in decline. Figure 1 shows the trends in the production of formal reports over a ten-year time span.

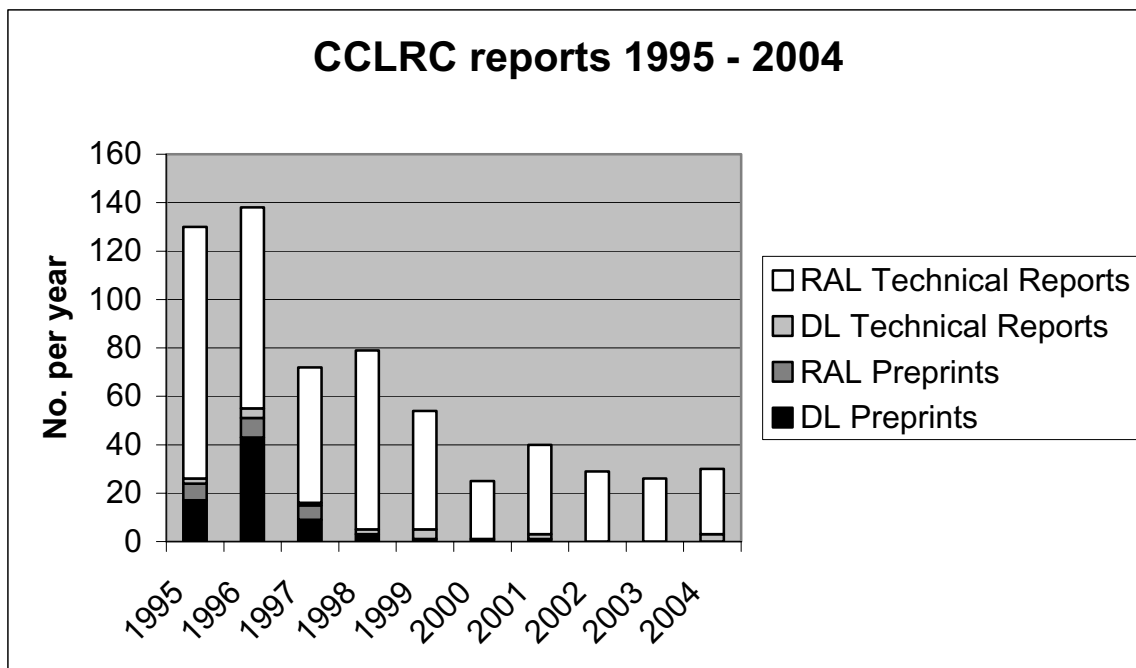


Figure 1: The decline of formal Technical Reports at CCLRC

The production of the technical knowledge has not stopped, but the barriers of the internal process have made it more attractive to produce 'grey' versions of the material. This limits the dissemination and resource discovery potential of the material, especially if it now resides in a variety of systems such as internal file stores. It can also lose the clarity of versioning: is this copy in location A the same as this copy in location B?

Reclaiming Technical Reports through an institutional repository

The previous section discussed some of the reasons that Technical Reports have been encouraged to go grey. It is a contention of this paper that by using an institutional repository the organisation and wider community can 'reclaim' Technical Reports. An institutional repository is a formal and managed archive of research output in the form of digital documents that is operated by a particular institution such as a university. In some cases the focus is only on e-prints²—pre- or post-publication versions of refereed papers. However, the remit of CCLRC's institutional repository, known as ePubs³, is the scientific and technical output of CCLRC; it does not distinguish in its collection remit between formally published or grey literature. It is concerned with the dissemination of the knowledge discovered by CCLRC and the users of its facilities rather than the final location of the information.

By encouraging technical report writers to deposit their material within ePubs, and making the internal process recognising that work as a technical report more efficient and effective, it becomes more visible and useful to the wider community. ePubs is committed to the long term preservation and curation of Technical Reports and by depositing such work in ePubs then its long term future is assured. Further, ePubs uses the IFLA Functional Requirements for Bibliographic Records to represent the work and its version relationships. It is possible to distinguish between different versions to bring clarity back into this area. This is discussed further in section 0 below.

Varieties of grey literature

Technical Reports exemplify a type of literature with a potentially long useful life becoming progressively greyer as time goes on. The longevity of this material suggests a refinement to the established definition of grey literature for a research institute like CCLRC. The established definition is: *'Information produced on all levels of government, academics, business and industry in electronic and print formats not controlled by commercial publishing i.e. where publishing is not the primary activity of the producing body.'*⁴ It is accepted that this definition needs narrowing for particular contexts, and such a refinement is: *'information produced in a specific working context which is, or might be of value outside that context.'* This additional specification is intended to capture the idea that the material, though not intended for publication in the formal sense, may profitably be 'published' to different working contexts.

There are many other varieties of grey literature produced at CCLRC, but one that is worth singling out is that produced by collaborative R&D projects in the form of deliverable documents, working reports, etc. Normally the distribution of these documents is specified by the contract under which the project is conducted, but it will usually be the case that some of the documents have unrestricted distribution. Furthermore, they embody valuable knowledge that might be applicable in wider contexts. For example, final reports of one project may serve as input to the baseline for the next project, or surveys of products or state of the art produced for internal decision making may retain their value for some time and have a wider applicability beyond the project that created them.

Figure 2 shows a schematic (and incomplete) depiction of parallel processes in an organisation such as CCLRC, and the ways in which grey literature is generated and consumed among them. These processes are represented as coarse-grained work flows, which, while not constraining the activities of scientists or managers, describe the stages that they pass through in a particular project.

Research process

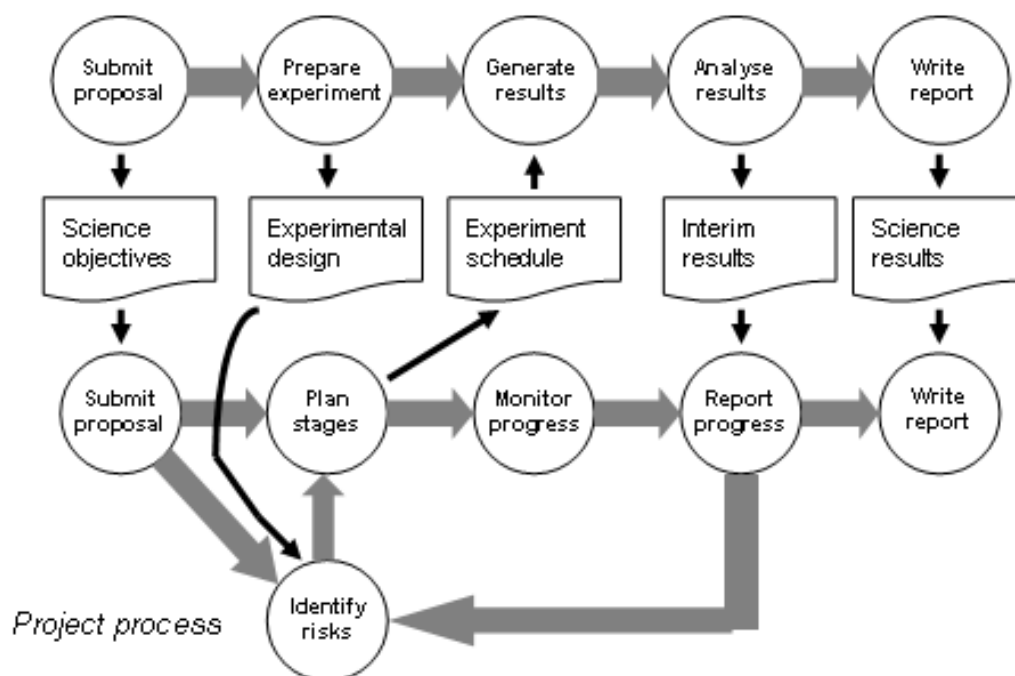


Figure 2: Exchange of grey literature between processes

The research process is what drives the production of scientific knowledge, and interlocked with it is the project process, which can be understood as part of the organisation's *business process* since it is concerned with receiving and using resources with which results are returned and disseminated.

These processes interlock in the sense that outputs from one stage serve as inputs to another stage in a parallel process. The analysis of results feeds into the progress monitoring; the scientific report forms part of the final project report; and so on. It is also possible to characterise in a similar fashion other processes such as the digital curation process⁵ and the publication process.

Inasmuch as the output of the stages is recorded in some form, it is by definition grey literature. As noted above, an additional specification may be introduced that the information is, or might be of value outside the context in which it was produced. This can mean two things:

- The information is useable elsewhere in a parallel process (for example, transfer from the research process to the project process);
- The information is useable in a different (later) process instance (for example, in a different project).

Figure 3 shows a variant of the diagram in which the research process is now concerned with collaborative development of software technologies (as opposed to the experimental science represented in Figure 2) and grey literature is generated that may be of value in other such projects. The broken arrows indicate such feeds into the future.

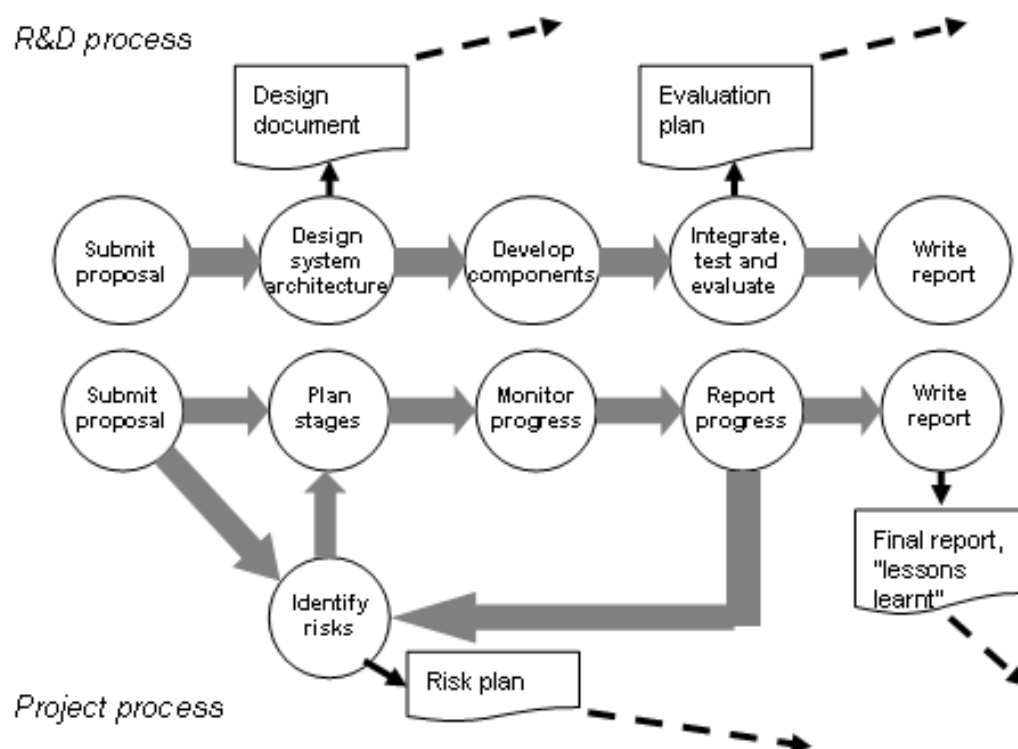


Figure 3: Grey literature available outside the immediate processes

Grey literature and the institutional repository

It is a contention of this paper that some of the grey literature produced within the organisation may be profitably stored in an institutional repository, so as to enable the kind of reuse outlined above. Particularly relevant are the institutional repository's capacity for long-term storage and for clarity in versions of material submitted. At CCLRC a programme of digitisation of Technical Reports is under way, with the ePubs repository playing a central role in storing and indexing the documents. This is part of the effort to have ePubs as a long-term archive for curation and preservation of the research output of CCLRC. The deposit of some project documents such as final reports is encouraged.

Regarding versions, ePubs partially implements the IFLA Functional Requirements for Bibliographic Records⁶ model. This model specifies four levels of description for any particular work. The *work* itself is an abstract concept of a distinct intellectual or artist

creation. A particular work can be realised as an *expression*, or series of *expressions*. Each expression will be physically embodied as a *manifestation*, or series of *manifestations*. A single exemplar of the manifestation is known as an *item*. ePubs implements the Work, Expression and Manifestation elements at present. Figure 4 shows an example of different expressions of a single work: in this case, a paper as published in conference proceedings, and the PowerPoint presentation that was actually shown at the conference.

Publications

Publication Type	Reference	URI	Local file(s)	Year
Presentation	9th DELOS Network of Excellence thematic workshop: Digital Repositories: Interoperability and Common Services, The Foundation for Research and Technology - Hellas (FORTH), Heraklion, Crete, 11-13 May 2005	http://www.ukoln.ac.uk/ev...	jones-mascord.ppt [Microsoft Powerpoint, 707 KB] [42 accesses]	2005
Paper in Conference Proceedings	Proc. 9th DELOS Network of Excellence thematic workshop: Interoperability and Common Services, Heraklion, Crete, 11-13 May 2005		delos-jones-20050425.pdf [Adobe PDF, 134 KB] [19 accesses]	2005

Figure 4: An example of different expressions of a single work in ePubs

Of course storage of the grey literature is only one half of the problem. It is also necessary to retrieve it effectively according to context. There can be no substitute for human expertise here, but the expertise can be augmented by suitable metadata describing content and the working context in which it was produced. Another contention of this paper is that the institutional repository could and should be integrated with other information systems of the organisation, so as to provide some of the context needed for retrieval. These systems include:

- Personnel systems;
- Financial systems;
- Project management/monitoring systems;
- Security infrastructure.

Such integration can offer benefits including accuracy of information (for example, allocation of publications to individuals), quality control (ensuring that all necessary stages are met), efficiency of metadata collection (for example, collecting metadata at project application stage and tracing through), adherence to policies and procedures (for example, approvals for paper submission), traceability and accounting, and report generation (for example, for performance assessment).

Integration of this kind will require integration of repository metadata with metadata associated with the other systems (HR-XML, CERIF, PRINCE 2 standards, ...). Moreover, to assist with retrieval, it is also necessary to describe the stage in the processes at which the document was produced, and to characterise those processes themselves in terms of the domain (scientific specialism). There are two dimensions of similarity of context: the content itself (for example, documents relating to data mining or to neutron scattering spectrometers) and the stage in the process (for example, a risk assessment, or a final report). The ePubs system currently supports the first of these through optional keywords associated with entries, though not the second, which has clear links to the project process.

Conclusions

An institutional repository, being a central point within the organisation for literature and data, is a component of the integration of processes, which promises benefits both to the organisation itself and to the researchers within it. Grey literature can be recorded and retrieved according to accurate and up to date personnel, project and business unit structure, leading to benefits in accuracy of reporting, quality control, etc. From the researchers' point of view, the repository assists them by storing multiple expressions or manifestations for the different parts of the process, and so brings clarity to work and version relationships. It also allows retrieval of grey literature from other projects that might otherwise be invisible to those who could

benefit from it. In short, the institutional repository is integrated as a part of the overall institutional memory.

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A Whiter Shade of Grey – a case study on how OECD Publishing cleared up the mess that was its working papers

Toby Green (*France*)

Abstract

OECD (Organisation for Economic Co-operation and Development) is a research-based Intergovernmental Organisation in the field of socio-economics. Its many published outputs include a number of Working Paper series – a format that is widely used by economists for informal or work-in-progress communication to their peers. In common with other economics institutions, OECD's Working Papers are freely available via the institution's websiteⁱ. A few were also posted on Repecⁱⁱ (Research Papers in Economics), a volunteer-based collaborative website that provides a decentralized database of working papers from around the globe. However, there was a problem. OECD's website is very large and librarians were reporting a great deal of frustration among their users because they couldn't easily locate particular papers. Equally, the collection of OECD working papers on Repec was far from complete and links to the full text were often broken. In fact, the situation was so poor that at UKSG, a conference for the serials community held annually in the UK, a room full of 250 librarians laughed at a representative from OECD Publishing about the state of the problem. Stung by this criticism, OECD Publishing resolved to fix the problem: this is the story.

Problem Analysis

In common with grey literature management in most places, at OECD, responsibility for 'publishing' working papers was decentralized to individual authors and their organisational units. Thus, each author tended to find his/her own way to load them onto the OECD's website. Guidelines on loading working papers existed, but they were often interpreted in different ways by different departments. This led to each particular series being loaded in a different way – making it difficult for users to understand how to navigate through the website. Moreover, no central database of all working papers existed and other non-working paper documents were often loaded among the 'proper' working papers. In short, there was no centralized quality control and consequently a poor service for readers and librarians.

Part of the problem also lay in the overall ignorance authors have for what services readers and librarians need beyond the content itself. Authors' knowledge about search engines and other discovery and delivery channels is usually simplistic and incomplete. The possibilities offered by new technologies, such as Digital Object Identifiersⁱⁱⁱ (DOIs), are not normally something that authors understand or follow. This is not surprising, their prime interest and expertise is in their own field – why should they also be experts in understanding the needs of readers and librarians and in understanding the possibilities offered by new publishing technologies?

By contrast, the OECD's non-grey (formal) publications are centrally managed by OECD Publishing, an in-house unit responsible for publishing all books (250 new titles annually), 5 journals and 80 databases. As a 'full-service' publisher, OECD Publishing has staff skilled in the three functional pillars of publishing: editorial, marketing and production, and they add considerable value to the author's manuscripts as they are transformed into publications ready for readers and librarians.

With more than 20 organizational units in the OECD, the first step to solving the working paper problem meant someone having to take responsibility centrally. Since all formal (non-grey) publishing at OECD is centrally managed by OECD Publishing, it seemed natural that they tackled the issue.

The first challenge was to assess the size of the problem: how many working papers did the OECD have? How many different series were there? Were the series complete and numbered sequentially? The absence of a central database meant that it took some weeks to answer to these questions. At the start of the project it was thought that OECD had around 800 working papers in five or six different series – in fact there are more than 1000 in 14 series. (If it was hard for OECD to answer these questions themselves, imagine what difficulties readers and librarians had!).

The absence of a central database also meant it took time to gather the working papers together, catalogue them and find the missing numbers. In some cases problems were found in the numbering sequences (gaps, duplicate numbers etc). Once gathered, a requirements analysis was performed by the Publishing staff based on their knowledge of reader and librarian needs. From this analysis a data model was made so a central database could be built within which the metadata and original papers could be housed. This metadata database has 17 fields (see table) and is capable of exporting the metadata with XML tags.

Publishing Metadata for published content	Examples of corresponding XML element(s)
Series Title (in both English and French) with Series ISSN number	<pre><Series> <ISSN> <SeriesTitle Lang="FR"> <SeriesTitle Lang="EN"> </Series></pre>
Main Title (in all available languages)	<pre><MainTitle Lang="EN"> <MainTitle Lang="FR"></pre>
Sub Title (in all available languages)	<pre><SubTitle Lang="EN"> <SubTitle Lang="FR"></pre>
Author(s) - first name - last name - affiliation - order (when several authors)	<pre><Authors> (unique element) <Author> (multiple element) <FirstName> <LastName> <AuthorOrderNumber> <AffiliationId> </Author></pre>
Publication date - Year - Day (when available) - Month (when available)	<pre><DayPublish> <MonthPublish> <YearPublish></pre>
Order Number (when available)	<OrderNumber>
Year number (when available)	<YearNumber>
Language(s) of the content - English - and/or French - and/or othe language (2 languages mean the content is bilingual)	<pre><Languages> <LanguageCode> <LanguageCode> ... </Languages></pre>
Long abstracts (in both English and French)	<pre><DescriptionLong Lang="EN"> <DescriptionLong Lang="FR"></pre>
Pages number (when relevant)	<NumberOfPages>
Keyword(s) (in all available languages) when available	<pre><Keywords Lang="FR"> <Keywords Lang="EN"></pre>
JEL classification (in all available languages) when available	<pre><JEL Code ="value is JEL code"> value is the JEL classification label </JEL></pre>
Theme(s) (in all available languages) when available	Multiple element <pre><Themes> <Theme ISSN="" Lang="EN"/> <Theme ISSN="" Lang="FR"/> </Themes></pre>
DOI (digital object identifier of the content)	<DOI>
Link to content file (whatever iis its format)	<Filename>
Related Link(s) to content available in other language(s). Different types of links can exist - links to the same content in another language - links to related content - inherited links to parent content (print publication, database, etc.) The type attribute specifies the type of cross reference	<pre><Xrefs> <Xref ID="value is the DOI of the related content" Type=" "/> value is the filename of the content </xref> <Xref ID="value is the DOI of the related content" Type=" "/> value is the filename of the content </xref> </Xref></pre>

In the knowledge that not everyone will come to OECD's own websites, the metadata was designed to be compatible with many channels and service providers. It was also designed to fit the needs of readers, for example, to generate "cite as" files compatible with RefWorks and EndNotes and to enable cited papers to be linkable via CrossRef. This meant Digital Object Identifiers (DOIs) had to be assigned to each paper. Finally, in order to be compatible with EconLit, an abstracting and indexing service, each record has a field for Journal of Economic Literature (JEL) classification numbers.

A more subjective problem concerned branding. The de-centralised management meant that each series had its own style of cover page; there was no consistent OECD branding. This problem was more serious in the inconsistent use of the term 'OECD' – some papers belonged to a series called 'Economics Department' – but how would readers know whose economics department?

Fixing the Problem

The next challenge was to fill the database with metadata. With 1000 papers to process, it was decided to outsource this work to Charlesworth (China), a specialist publishing services company skilled in managing online journal articles. Charlesworth was supplied with PDF and printed copies of each paper and a set of guidelines on how to source the metadata from the original paper. They returned a structured file which was loaded into the new database. Each record was then quality assured by OECD Publishing staff.

Meanwhile a workflow was established to enable new working papers to be loaded into the system by OECD Publishing staff. An interface was designed so that an operator could load each of the fields in the database, together with fail-safe/productivity enhancing tools to ensure loading is not burdensome and is accurate. For example, the working paper series field is completed by selecting from a drop-down list, not by keying the series title. This saves time and improves accuracy.

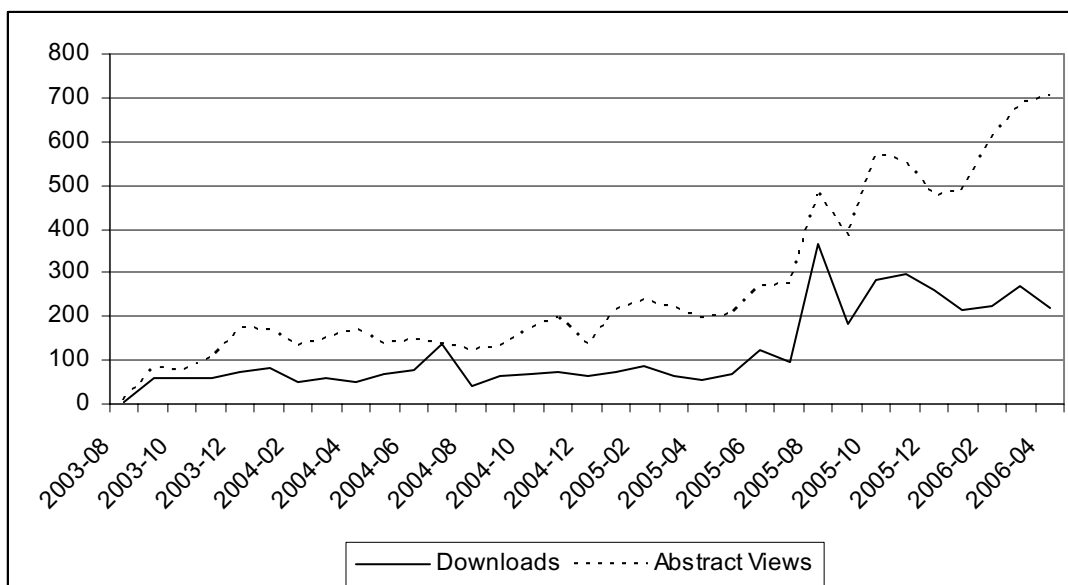
Next, following an Information Architecture phase to determine the best way to present the working papers online, a specification was drawn up to create a special working papers sub-channel in SourceOECD, the OECD's full-text e-library^{iv}. In parallel, discussions with Repec led to an agreed method to upload all working papers directly from the database to Repec's system, automatically. In fact, the loading 'engine' pushes the working papers from the database directly to both Repec and SourceOECD simultaneously – eliminating time-consuming manual loading procedures.

The branding problem was solved by building a tool that makes new covers for each working paper 'on the fly' – as the paper is downloaded, a cover page is generated and added to the front of each PDF file. All the text items on the cover page come from the metadata database. Aside from the improved branding (it is now obvious at first glance that each paper's origin is OECD) a "cite as" box helps users correctly cite each paper, complete with a persistent-link DOI.

Problem solved

Once the metadata database had been checked and the papers loaded into an e-warehouse, the papers were pushed into SourceOECD's development site to allow final quality checks to be made. Once checked, the service went live: all 1000 papers in 14 series at the same time. Shortly afterwards (August 2005) the metadata was loaded onto Repec, replacing the author-managed records. For the first time, all OECD working papers were present in Repec, a vital channel for dissemination to students and researchers in economics.

The results were immediate. As the chart shows for one hitherto incomplete series, where authors had also made loading errors (e.g. broken links), downloads increased to an average of 257 downloads a month from an average of 73 downloads a month prior to the new system. Abstract views are now running at 700 a month against 290 a month previously.



The workflow required to load new working papers is simple, so simple a new paper can be loaded onto the database in less than seven minutes and will be automatically uploaded onto both SourceOECD and Repec simultaneously. As new channels are added so the automatic loader's reach will be extended, keeping costs the same since we will still only have one database to load.

Future Plans

The project is not complete. OECD's main website is still dependent on individual authors loading their working papers manually, thus all the problems of inconsistency and accuracy remain. The necessary programming needed to adapt the underlying structure of the main website to accept highly-structured incoming metadata remains to be done. Meanwhile, OECD Publishing has successfully negotiated to load the metadata onto Research Now, a new e-journal and institutional repository aggregated portal. Other targeted portals include IngentaConnect, SwetsWise and Ebsco, each of which already include other OECD publications' metadata. Another area of work concerns search engines: while the system is already optimized for Google, discussions are in hand to include the working papers in Google Scholar and Scopus/Scirus. In 2007, users of SourceOECD will be able to click to the full text of cited articles from each working paper's reference list (via CrossRef).

A Whiter Shade of Grey

Grey literature has traditionally been published informally and has been freely available. Usually the act of publishing grey literature is de-centralised to individual authors. On the other hand, 'white literature' or formally published books, journals and so on, have traditionally been published separately from grey literature by specialist publishing entities. The arrival of the Internet and the migration of both grey and white literature to this new medium mean that there is now no particular reason to continue to publish these two types of publication separately. OECD Publishing, in taking responsibility for the OECD's grey literature, demonstrates what is possible and what benefits accrue if grey literature is handled in the same manner as formal publications. However, this improvement does not come at zero cost. To date, OECD Publishing has spent around \$80,000 in solving the problem and delivering a solution that will meet the needs of librarians and readers. At \$80 a paper, this is not cheap. However, adding each new paper costs much less and running the system is not costly – and these costs are currently absorbed within OECD Publishing. OECD Publishing's operating budget, however, is balanced by the revenues earned from selling OECD's e-library service, books, periodicals and databases. So, because the working papers earn no revenues of their own, they are 'free-riding' on the back of the other publications.

Conclusion

The benefits of a publishing unit centrally managing these working papers are clear. Librarians are no longer laughing at us because their users visiting SourceOECD or Repec are assured of finding a complete and up-to-date listing of all available OECD working papers. In the case of OECD's working papers, navigation is simple and straightforward now, there are no longer broken links, missing numbers or inconsistencies. Tools such as "cite as" make it easier for readers and the use of DOIs will give them confidence when citing papers. The Organisation's branding is more consistent and professional on each downloaded paper. While sufficient revenues are earned from the sales of other publishing services, the working papers can remain freely available to all – however, if revenues faltered, the question of who pays to maintain the system would have to be asked. However, the key lesson from this case study is this: authors clearly need the help of publishing professionals to achieve their goal of maximising the dissemination of their work.

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 - ⁱⁱ REPEC, Research Papers in Economics <http://www.repec.org>
 - ⁱⁱⁱ DOI, The Digital Object Identifier <http://www.doi.org>
 - ^{iv} OECD Working Papers <http://www.sourceoecd.org/vl=40545919/cl=14/nw=1/rpsv/workingpapers/>



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Entering Grey Waters: Challenges and Solutions of Providing Access to Non-traditional literature in an Aquarium's library *

Marisol Ramos and Steve Vogel (*United States*)

Abstract

The seventy-year-old library collection at the Cabrillo Marine Aquarium (CMA) has grown steadily from its humble beginnings as the original collection of the old Cabrillo Marine Museum at the Cabrillo Beach Bathhouse in San Pedro, California. Until recently, the library was run by the Education/Collections curator and assisted by one volunteer who helped to catalogue the collection using the Library of Congress Subject Headings, did inventories, data entry and other library-related activities. In 2004, the Virginia Reid Moore (VRM) Marine Research Library was opened as part of a CMA Expansion Project and a librarian was hired full-time to administer and manage the library and two part-time assistants have been hired to assist running the library.

The VRM Library is a small collection of about 2,000 + books, mostly in the marine sciences (marine invertebrates, ecology and fishes) and 40 titles of donated journals and magazines, of which about 5 are current paid subscriptions (California Fish and Game Bulletin, Fishery Bulletin, Marine Mammal Science, Nature, and Science News). But, our strength lies in the grey area beyond books and journals, where a large quantity of useful information resides. One of the unique characteristics of the VRM Marine Research Library collection is the wide variety and quantity of grey literature and ephemera materials from a wide variety of sources: local environmental organizations, historical societies, governmental reports, other aquariums publications, etc... These documents have valuable and unique information, which often is not found elsewhere. These materials are vital to the VRM collection since they are rarely collected by traditional libraries and offer a rare view of non-traditional materials by non-profit, private and community organizations with common interests with the Cabrillo Marine Aquarium mission of research and education about the marine life of Southern California.

Unfortunately, these materials are inaccessible to users. Although the materials have been finally relocated to the library, they are still housed in boxes without indexes or any other access point. To begin to address this problem, the library requested that the aquarium administration invest \$4,500 to acquire high-density file cabinets to help preserve and provide access to this material. The cabinets have been delivered and installed in the library but the biggest challenge remains—indexing and making this collection accessible. Our goal is not only to secure the proper storage of these materials but also to centralize and supply access to these valuable resources. To achieve this goal, a three-pronged strategy was designed to give access and further develop our grey literature and ephemera collection: indexing and thesaurus development; database with online search capabilities and outreach to local and regional organizations to update and expand the current collection.

This paper will discuss the challenges of collecting and preserving grey literature and ephemera in the marine science knowledge-domain, and the design, execution and expected outcome of this VRM library initiative.

Swimming in Grey Waters: Challenges and Solutions to Manage Grey Literature and Ephemera

Grey literature and ephemera are discussed in this presentation, because both types of publications are part of the collection and are worth preserving for their rich information content and uniqueness. Grey Net defines *grey literature* as "Information produced on all levels of government, academics, business and industry in electronic and print formats not controlled by commercial publishing."¹ *Ephemera* is a term that has been defined as: "Items manufactured for a specific, limited use, and usually intended to be discarded thereafter, especially printed matter on paper."² This definition does not convey the reality of most ephemera collections, since indeed instead of being discarded a great quantity of ephemera is collected and preserved.

* First published in the GL7 Conference Proceedings, January 2006

For the purposes of this paper, ephemera are defined as: Materials (physical or electronic) that regardless of appearance, quality or quantity, and that at some point were considered disposable and of little value or no value, through time, had become valuable in such a way that it had broadened their appeal and made them desirable to be collected and preserved by individuals, collectors and information institutions. These materials become the non-traditional, alternative evidence of mainstream and non-mainstream groups in society. (Ramos-Lum 2002, 9)

CMA has historically gathered and accidentally retained considerable quantities of reprints, clippings, curriculum guides, brochures and the like. Our diverse staff receives and shares proceedings and publications sent to them by colleagues from like-minded institutions and agencies. It has been beneficial for us as an institution to have materials such as these filed under subject headings or by institution or simply mainstreamed into our shelved holdings. When working on a given topic it has largely been beneficial to have similar materials co-located. In many cases, items such as reprints, posters and multi-media materials do not fit in easily. The main use for much of our grey literature has been for educational purposes. We temporarily display current newspaper clippings in our exhibit hall and afterward file them by subject. Folders by subject are used for docent training and as reference material for exhibit development and use in our publications. Articles stripped from duplicate magazines and filed by subject add to this resource and make it easy to browse a subject or organism instead of tracking down isolated shelf resources in various publications. Our director has requested that files be kept on related institutions including examples of their printed materials at all levels from visitor guides to booklets, pamphlets, annual reports and newsletters. These materials have helped us develop content, program and design ideas as well as providing networking opportunities when we can become aware of similar initiatives at other organizations.

Because of the importance of these materials to the aquarium a wide range of materials have been collected and continue to be acquired. This situation presented three different challenges for the Education Curator and the Librarian:

- Determining what we really have (Inventories)
- Deciding what we want to collect from now on (Collection Development)
- Making these materials available to our users (Access)

Inventories

As a way to handle the first challenge, since May 2005, the library staff started conducting several inventories to get a sense of the size and variety of subjects in the collection. We have not finished these inventories but here are some partial results:

Table 1 (Partial Inventory totals) 2004-2005

Type of Materials	Totals
Newsletters	72 titles
Reprints	51 letter size documents boxes
Newspaper clippings binders	15 binders
Proceedings	10 titles
USA Gov. Reports	13 titles
State/Local Reports	14 titles
Environmental Reports (non-governmental)	9 titles
Cabrillo Master Plan	5 versions
CMA architectural proposals	10 versions
Catalogs	50 titles
Workshops/Training materials	5 titles
Miscellaneous (brochures, flyers, CDs, stripped magazine articles, etc)	?

The inventories have been hard to do because most of the materials were catalogued as unique items in the regular book collection, even though they were part of sets of reports. While converting the old library book collection to a new library cataloguing system, we started taking out and placing together these different sets of reports, surveys and other grey literature materials. Other reports had not been catalogued yet and were stored in boxes and moved from the old library to the new library space. These partial inventories help us to see the patterns of collecting during the last 20 years, and inform one of our first solutions to handle the acquisition of these materials—a collection development policy for the library.

Collection development policy

Until last year (2004), the library never had a collection policy that specifically identified what type of materials were acquired for the library but this year (March 2005) we submitted such policy and put in writing was has been the "unofficial policy": The

following types of materials are acquired [for the library]: serials, monographs, books, newsletters, videos and other media, proceedings/transactions, technical reports, government documents, theses and student projects. (VRM Collection Development Policy, 2005).

Our biggest sources of grey literature come from newsletters and reports (both governmental and non-governmental). We are starting to collect student projects to support the work of one of the new spaces at the aquarium, the Aquatic Nursery, and it is our hope to expand this service to other departments at CMA as a way to record the work done by student interns doing research at the CMA. We are still working to improve this policy, each year it will be revised to adapt it to our needs.

Access

The biggest challenge left to our library is to make our grey literature and ephemera collection available to our users. Ideally, we would like to have one database that could manage all the materials that the library holds. Most of the technical reports, research studies and other governmental materials are not hard to add to our cataloguing database. Surpass Central, our library cataloguing and circulation program, allows the creation of customized templates and we are testing one for Grey Literature.

Ephemera materials are very important for our organization and we have accumulated a wide array such as aquarium brochures, flyers, pamphlets, clippings, online news reports, and finally, reprints (sent by the authors to different staff members, or received as donations from retired professors and scientists). As with grey literature, we will be testing a new template to capture this information and make it available through the library online catalogue.

The ultimate goal of adding these records for grey literature and ephemera is to make these materials searchable online. Ideally, we will be able not only to search books and journals, but also our subject-based collections. We want to make the staff and other outside users aware that we also have reprints of articles that may otherwise be "lost" inside journal issues. To be able to know what we really hold, we really improve our ability to serve all our stakeholders (staff, volunteers, docents, Friends' members and the general public).

Preservation

Based on our preliminary inventories we found a lot of preservation issues that we need to address to be able to protect our collection for future generations. Our biggest challenge is dealing with acidic materials such as clippings binders, stripped magazine articles and reprints. As we started the process of cataloguing these materials, we will start making preservation copies of the most endangered materials. This is not a difficult process but it is a very time consuming one. As part of the inventory, we are identifying the materials that need preservation or conservation measures and as time and resources allow it, we will continue the preservation process.

Conclusion

Making our collection of grey literature and ephemera accessible is an ambitious goal and we are still in the developmental phases of it. Computer programs do not always perform as advertised and there are many other challenges related to the basic problem of cataloguing non-book, non-mainstream materials (how to assign meaningful subject headings to improve browsing and a good cross-reference system especially since these materials can be catalogued and searched by more than one heading). We still need to ask ourselves what access point we should use when creating these records. We have just started indexing the reprint boxes and we hope to develop a thesaurus to facilitate searching. Selection is the key for a more coherent and comprehensive collection. Our challenge is to make selection a more conscious decision, based on our collection development policy, instead of a passive reaction. We had already started this process when we decided to engage in this discussion at this conference and we look forward to the future, when more people can enjoy these amazing resources.

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Endnotes

¹ Grey Literature Network Service 31 October 2005 <http://www.greynet.org>

² Art and Architecture Thesaurus 31 October 2005 <http://www.getty.edu/research/tools/vocabulary/aat/>

Grey Literature: Problems and Prospects for Collection Development in E-environment

Munusamy Natarajan (India)

Abstract

Literature written during the various stages of research and development projects is published in various forms. A large number of documents are made available commercially in the form of journal articles and books. However, there are other types of publications that are not so easily available through commercial channels, called the grey literature (GL). They may contain comprehensive, concrete, and up-to-date information on research findings. Most of them are published officially at a later stage, detailed information on techniques, methods, measured values, and details of experiments are frequently omitted. For such details of importance for further research, the grey literature is often the first and only source of information. This article deals with history and production of GL by government agencies, professional organizations, research centers, universities, public institutions, special interest groups, and associations and societies whose goal is to disseminate current information to a wide audience. Discusses the former role played by System for Information on Grey Literature (SIGLE) is a bibliographic database covering European GL in the fields of pure and applied natural sciences, technology, economics, social sciences, and humanities with efforts made by different countries / organizations like IFLA, BLDSC to acquire and access the same. The need for standards is also stressed for easy cataloguing and access in a network environment.

The digital environment and the networking capability enabled the e-prints as one of the GL. The goal is to create many e-print archives in India and the formats to follow for easy access with retrieval software for partnership. Some of the premier e-print archives like ArXiv, hosted by Los Alamos National Laboratory, in the area of scholarly publishing alternatives; CogPrints, hosted by the University of Southampton in the U.K., focused mainly on papers in Psychology, Linguistics and Neuroscience; and NCSTRL (Networked Computer Science Technical Reference Library) is an international collection of computer science research reports are discussed with the advantages of e-prints. Suggested to have one national repository for e-print archives and for collecting the GL and making them available for access to any one, from anywhere, at anytime. Library professionals should take interest in creating the collection of GL in print and e-format.

INTRODUCTION

Searching and accessing the grey literature (GL) have always been a great challenge for librarians and documentalists. The phenomenal advances in information and communication technology (ICT), recurring shortages of conventional publications and persistent shortfalls in library acquisitions budget has, in recent times brought to the fore, the significance of GL. The first international conference on GL dealt with the problems identification of and access to GL as more and more urgent during December 1993. Due to the potential of Internet and increase in self-publishing via World Wide Web (WWW), and the impact of WWW on the acquisition, control and provision of GL, enhanced access through direct online distribution to any number of users. This article attempts the problems and prospects of collection development and access in electronic environment due to the growth of electronic publishing and the creation of e-print archives at institutional level.

DEFINITIONAL ANALYSIS

Grey Literature (GL) refers to publications issued by government, academia, business and industry, in both print and electronic formats, but not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization. Scientific grey literature comprises newsletters, reports, working papers, theses, government documents, bulletins, fact sheets, conference

proceedings and other publications distributed free, available by subscription, or for sale.

GL, also known as the grey or hidden web, the information that is not searchable or accessible through conventional search engines or subject directories and is not generally produced by commercial publishing organizations. Keenan (1996) defines GL as semi-published literature which is not formally listed or priced but is nevertheless in circulation. Therefore, GL is the information and resources that do not categorically fall into what is available via standard traditional or commercial publishing channels. It has emerged in scope and importance in recent years due to the proliferation of critical information now readily available to organize and access from electronic publishing ventures.

BIBLIOGRAPHIC CONTROL

GL is really a type of informal communication. Grey publications may contain comprehensive, concrete, and up-to-date information on research findings. Investigations have shown that, even when grey documents are published officially at a later stage, detailed information on techniques, methods, measured values and details of experiments are frequently omitted. For such details of importance for further research, the GL is often the first and only source of information. The US NTIS issues over 70,000 "unpublished" reports per year. British council local authorities produce around 50,000 documents per annum. System for Information on Grey Literature (SIGLE) makes it available approximately 35,000 European reports, etc. per year. The CERN Library has very important collection of GL with more than 350,000 documents (with full-text electronically available from February 1994 onwards). Through Open Archive, they framed a submission mechanism for a long-term storage system with management policy for submission and preservation. These show that the production of GL is increasing. The unwillingness and inability on the part of producing organizations to promote their output of GL leads to problems for the producers of secondary services, for libraries who wish to collect it and for end users. Otherwise GL is collected through establishing personal contact networks, using collection agents, developing exchange arrangements, undertaking acquisition tours, making use of embassy services in foreign countries and so on.

COLLECTION DEVELOPMENT

The Policy and Management of Grey Literature Collections requires both designated budgets and human resources. "There is need for a clear government policy on GL, which would no doubt require: (1) legal deposit, (2) funding, and (3) national documentation centers in sectoral fields: e.g. agriculture, S&T, social science, medicine, etc." - Japhet Otike (U. K) and "The availability of the content [i.e. text] of a GL document largely depends on the policy of the generating institution. Institutions may exercise their authority as to whether or not all of their documents should be made [available] for public knowledge; however, their existence should be known." - Pratibha Gokhale (India).

Grey literature acquisition procedures can be

- Direct electronic submissions
- Downloading from other grey literature servers
- Digitization of paper documents
- Exchange with other labs (Annual reports)
- Web Submission options:
 - Bibliographic Notice Input/Update
 - Full text document Transfer or Link (TeX, Word, PDF, HTML)
 - Revised version Transfer
 - Alert an e-mail distribution list
 - Forward to Printshop and Mail Office
 - Ask for approval (internal & scientific notes)

THE FORMER ROLE OF SIGLE

System for Information on Grey Literature (**SIGLE**) was a bibliographic database covering European GL in the fields of pure and applied natural sciences, technology,

economics, social sciences, and humanities. It was a cooperative project of the European Association for Grey Literature Exploitation (**EAGLE**), which was founded by the European Communities. EAGLE provided an interdisciplinary reference service of GL and makes grey documents available in the SIGLE database. Each year approximately 45,000 documents were added to the file. Each SIGLE record contained the bibliographic details of the cited document. An important feature of each record was the information on document availability. Each document was available on loan or for retention as appropriate from the source indicated in the record. Each member of the EAGLE Association was represented by a national center, which was responsible for collecting GL. The centres were also responsible for ensuring that all listed documents were available from the location cited in each record in the database. In April 2005, the date when it was dissolved, fifteen EAGLE Centres were participating in this European association.

ELECTRONIC ENVIRONMENT

The preprint culture is the strongest in the scientific and technical disciplines. These GL is often difficult to find, and even more difficult for librarians to collect systematically, manage and preserve. But the web and other digital technologies are changing all that. A variety of web-based systems are becoming available for accepting deposits of papers. These systems make the research output of institutions easier to discover as well as manage and preserve. They also make it possible to share information globally through compliance with a standard metadata harvesting protocol. As Julia Gelfand (1998) pointed out that science policy sites, scientific protocols, and scientific journalism are examples of GL available on the Web, which is extremely valuable for communication among scientists. Numerous commercial database vendors selectively index GL. Many organizations and individuals are also providing access to their works online.

Institutional Repositories (IRs) is a new concept for collecting, managing, disseminating and preserving scholarly works created in digital form by faculty and students in individual universities and colleges. The Scholarly Publishing and Academic Resources Coalition (SPARC) examined the strategic roles IR play and outlined the viability and long-term impact of institution-based digital collections that preserve the research and scholarship of an institution (Crow, 2002). Crow defines an institutional digital repository as "Collection of digital material hosted, owned or controlled or disseminated by a college or university, irrespective of purpose or provenance". It asserts that IR is a natural extension of an academic institution's role as a generator of primary research and lists the four essential characteristics of an IR as:

1. Institutionally defined
2. Scholarly content
3. Cumulative and perpetual and
4. Interoperability and open access.

An effective IR of necessity represents collaboration among researchers, librarians, information technologists, archivists, records managers, administrators and policymakers.

The main functions for the creation of an IR would be:

- To publish and archive scholarly work of an institution locally, using authentic information sources
- To enable long-term preservation of scholarly work
- To facilitate constituent members of an institution an easy and rapid way to publish and archive their research locally
- To provide an integrated view of and act as a single entry point to scholarly work of an institution
- To provide wider accessibility, visibility and distribution of the scholarly work of an institution.

There are now implementation models to consider and software decisions to make. Some systems are open source, while others are commercial. Foremost among the free variety of software is ePrints, from the UK's University of Southampton and its solution is squarely focused on the faculty working paper (also called preprint or e-print). The ePrints model assumes that faculty will directly upload their own prepublication scholarship for open access via an institutional or subject-based

repository. A number of institutions are now using this software, including CalTech and the Digital Library of the Commons at Indiana University.

Another package is DSpace, which is more flexible than ePrints; developed through a partnership between the MIT Libraries and Hewlett-Packard. It makes fewer assumptions regarding what type of object is being uploaded. The Berkeley Electronic Press (bepress) offers a commercial solution for peer-reviewed journals when the University of California entered into a co-development agreement with the press to add key features for IR support. Now the bepress software is compliant with key standards and simpler to use. The digital repository component of the proposed OSU Knowledge Bank would "archive and facilitate access to the many types of digital intellectual content being generated by units of the University." Inspired by the Open Archives Initiative, the United Kingdom (UK) Joint Information Systems Committee (JISC) established the Focus on Access to Institutional Repositories (FAIR) programme in 2002. One of the programme's objectives was to "explore the challenges associated with disclosure and sharing [of content], including IPR and the role of institutional repositories". To this end, the JISC funded a one-year project called RoMEO (Rights Metadata for Open archiving). RoMEO, which took place during 2002–2003, specifically looked at the self-archiving of academic research papers.

NATIONAL AGENCY

To overcome the bibliographic control, if producers of such literature realize its potential value and became more concerned about its control, the steps they might take are to:

- Produce reports to a better bibliographic and physical standard
- Be less restrictive in what they release
- Announce documents through local publicity and by sending copies to appropriate secondary sources
- Send copies to national depositories – both copyright libraries and organizations with a special interest to their work
- Have large print runs to meet the demand that more publicity will generate.

There is a need for specialized organisations to collect, have bibliographic control and for the provision of document delivery services of GL. They fall into three categories:

1. National centers specializing in GL
2. National or International centers specializing in particular subject fields and which include GL and
3. National centers attempting to develop comprehensive collection of literature (including GL) in all subject fields.

INDIAN SCENARIO OF E-PRINTS

In India, few research institutes like Indian Institute of Science (IISc), Bangalore and Indian Institute of Technology(s), Indian Institute of Management(s) and few scientific organizations have started creating their GL in e-form. Mostly the software used is either e-prints or Dspace. Information Library and Network (INFLIBNET) of UGC has started collecting the Theses and Dissertations and making them available in e-formats. The Vidyanidhi (Meaning 'Treasure of Knowledge' in Sanskrit) Project is India's premier Digital library initiative to facilitate the creation, archiving and accessing of doctoral theses. Vidyanidhi is an information infrastructure, a digital library, a portal of resources, tools and facilities for doctoral research in India. Vidyanidhi is envisioned to evolve as a national repository and a consortium for e-theses through participation and partnership with universities, academic institutions and other stakeholders. It enhances access to Indian theses and enlarges the reach and audience for Indian doctoral research works. It developed a mechanism for depositing and accessing digital thesis from anywhere, anytime. The specific objectives of the project are developing software tools and information resources for e-publishing, archiving and accessing academic research. The project is envisaged to evolve into a consortium of participating and collaborating universities in India with a common framework and policies regarding copyright, formats, and other standards. But still other type of GLs are not kept open or made available in e-format.

ADVANTAGES

The advantages of GL in e-environment are as follows:

- Easy to post, bypass the slow review/publishing process
- Inexpensive to prepare, available freely without subscription fees
- Easy to distribute, easy to search
- Can be rapidly updated, corrected or extended
- Wider access to research material, higher impact for research material
- Papers which are freely accessible are cited more readily (Steve Lawrence)
- Safe long-term storage and facilitation of research sharing

DRAWBACKS

The drawbacks of GL are:

- Coordinated national bibliographic control is lacking and access is not optimal
- Internet publishing is only in its nascent stages and the efforts are populating the Web with "soft", flimsy and often repetitive
- Most of GL materials are not accessible via web from National level libraries
- Lack of an organised "one stop shop" or portal to this knowledge.

LEGAL ISSUES

The creation and maintenance of e-print repositories, whether institutional or subject-based, raise a number of legal issues that have significant implications for those running the repositories and legislation varies between countries. The major legal issues, discussed individually, are the same as those that face all electronic publishers, namely:

- Breach of confidentiality and official secrets;
- Personality and image rights;
- Data protection, copyright and database right;
- Moral rights, defamation;
- Obscenity and race hate material;
- Contempt of court, trademarks, and domain name disputes.

CONCLUSION

GL provides citizens with the information they require making decisions and continuing to serve as a source of information that is consulted most often. The impact of the Internet on the availability of and access to pertinent GL is only modest. A Web site called GreyNet has been launched which assists students, librarians, publishers and researchers in the study, use and production of GL. The International Journal on Grey Literature (now The Grey Journal) was launched to serve as a forum for discussions of all aspects of GL and its applications for academics and practitioners. Collection of GL mainly depends on the co-operation and co-ordination among library and information centers of National importance. By introducing a common IR portal for GL by having some policy at national level to deposit the e-copy to the portal, the countries collection can be made available. Thus, institutional resources fill an important void and are likely to remain a part of our information landscape. Library professionals should take initiatives to acquire, process, and have bibliographic control and use of all the information sources available in the form of GL.

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On the News Front

HOW TO WRITE AND DISTRIBUTE GREY LITERATURE: “NANCY STYLE” IS NOW READY FOR YOU!

What is “Nancy Style”?

“Nancy Style” is the informal name given to the **Guidelines for the production of scientific and technical reports: how to write and distribute grey literature**. These Guidelines were developed after a proposal by the Istituto Superiore di Sanità (ISS, Rome, Italy) to create uniform requirements for the production of GL. The proposal was presented during the 7th International Conference on GL held in Nancy (France) on 5-6 December 2005*, and that is where the name “Nancy style” comes from.

The initiative to reach a consensus for the production of the Guidelines was discussed at the Round Table on Quality Assessment by a small group of GL producers, librarians and information professionals who agreed to collaborate in the revision of the document proposed by the ISS. Then, the group approving the guidelines – informally known as the “Nancy Group” – has been formally defined as the Grey Literature International Steering Committee. The GLISC has now its own site (www.glisc.info) where the Guidelines are available in English, Italian and shortly also in French.

What is the objective of the Guidelines?

The Guidelines are created primarily to help authors and GL producers in their mutual task of creating and distributing accurate, clear, easily accessible reports in different fields. The goal of the Guidelines is, in fact, to permit an independent and correct production of reports in the respect of the basic editorial principles.

Which is the content of the Guidelines?

The Guidelines include ethical principles related to the process of evaluating, improving, and making available reports and the relationships between GL producers and authors. The latter sections regard the more technical aspects of preparing and submitting reports. The GLISC believes the entire document is relevant to the concerns of both authors and GL producers. In particular, a correct report structure will help authors to better explain the technical content of their documents and readers to understand it more clearly; a correct structure will also permit to be easily converted into XML to allow advanced search facilities in specific parts of the document such as introduction, conclusion, and citations.

Is there any copyright restriction on use of the Guidelines?

The total content of the Guidelines may be reproduced for educational, not-for-profit purposes without regard for copyright; the GLISC encourages distribution of the document and welcomes organizations to reprint or translate it into languages other than English for no-profit purposes (the Italian version is already available and the French one is in preparation).

“Nancy Style” is freely available at www.glisc.info
For any information, address to: secretariat@glisc.info.

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* De Castro P, Salinetti S. “Uniform Requirements” for grey literature: proposal for the adoption of “Nancy style”. In: *Publishing Research Quarterly* 2006; 22(1): 12-17.



Harnessing the Power of Grey

EIGHTH INTERNATIONAL CONFERENCE ON GREY LITERATURE

Lindy C. Boggs
International Conference Center
New Orleans, Louisiana USA
4-5 December 2006

Conference Program

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● OPENING SESSION

Chair, *Marcus A. Banks, New York University (United States)*

Welcome Address, *Representative of the City of New Orleans*

Keynote Address, *Bonnie C. Carroll, President Information International Associates Inc. (United States)*

● SESSION ONE - COLLECTION DEVELOPMENT, COLLECTION POLICIES, AND COLLECTION RESCUE

Chair, *Joachim Schöpfel, INIST-CNRS (France)*

Past, present and future: the evolution of a collection – Grey Literature at the British Library

Elizabeth Newbold and Samantha Tillett, The British Library (United Kingdom)

Communities of Practice – A trigger for creating community focused digital libraries

Cameron Esslemont, Global Library Services Network (Australia) Renee du Toit, Fred Hollows Foundation (New Zealand) Steve Baxendale, Pacific Open Learning Health Net (Fiji)

Grey Literature - Taxonomies and Structures for Collection Development

Julia Gelfand, University of California, Irvine Libraries (United States)

● SESSION TWO - METADATA SCHEMES, REPOSITORIES, SOFTWARE, AND STANDARDS

Chair, *Gina R. Costello, Louisiana State University, (United States)*

Harnessing NASA Goddard's Grey Literature: The Power of a Repository Framework

Nikkia Anderson, Gail Hodge, and Andrea Japzon, Information International Associates, Inc., NASA Goddard Space Flight Center (United States)

Hyperactive Grey Objects *Keith G Jeffery, CCLRC Rutherford Appleton Laboratory (United Kingdom) Anne Asserson, University of Bergen (Norway)*

The UK Electronic Theses Online Service (EThOS) *Anthony Troman, British Library, United Kingdom*

Metadata-based analysis to improve clinical trial exchange ^(Reserve)

Daniela Luzi and Fabrizio L. Ricci, CNR-IRPPS; Luca Dan Serbanati, Politehnica University (Romania)

● PARALLEL SESSION I (Parallel Sessions run simultaneous with Roundtables on both days of the conference)

Chair, *Gretta Siegel, Portland State University (United States)*

Usage patterns of grey literature in open archives

Joachim Schöpfel, INIST-CNRS and Chérifa Boukacem-Zeghmouri, University of Lille-3 (France)

A questionnaire survey on GL management and open-archive promotion of Italian special libraries

Rosa Di Cesare and Roberta Ruggieri, CNR – Istituto di Ricerche sulla Popolazione e le Politiche Sociali (Italy)

Legal Foundations of the Scientific and Technical Grey Literature Development in Russia

Leonid P. Pavlov, The Scientific and Technical Information Centre of Russia

Grey Literature archiving in Open universities: A model for India

Manorama Tripathi and VkJ Jeevan, Indira Gandhi National Open University (India)

● ROUNDTABLES (See Facilitators, Content, and Targeted Groups on page three, below)

(1.) Curriculum Development (2.) Metadata Schemes and Repositories (3.) Quality Assessment of Grey Literature



Harnessing the Power of Grey

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DAY TWO

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Chair, Anne Asserson, University of Bergen (Norway)

Securing the Future: Saving Costs through Collaboration Timothy A Lepczyk, Timothy Gawne, Gregory March, Alison Connor, Carrie Snesko, and Sara Green, University of Tennessee (United States)

Implications of Copyright Evolution for the Future of Scholarly Communication and Grey Literature Marcus A. Banks, New York University (United States) Cees de Blaaij, Library of Zeeland (Netherlands)

Dis-investment in Critical Grey Literature in the USA or... What Happens When the Harness Gets Dropped? Gretta Siegel, Portland State University (United States)

A Cost-Benefit Analysis of Knowledge Generation: Measuring Research on Grey Literature in a Conference Networked Structure Dominic Farace and Jerry Frantzen, GreyNet (Netherlands); Joachim Schöpfel and Christiane Stock, INIST-CNRS (France)

● SESSION FOUR – MAPPING GREY RESOURCES FOR COSTAL AND AQUATIC ENVIRONMENTS

Chair, Deborah Cutler, Office of Scientific & Technical Information, OSTI; U.S. Department of Energy (United States)

Louisiana Coastal Wetlands and Louisiana Coastal Grey Literature: Vanishing Treasures Gina R. Costello, Louisiana State University (United States)

Searching down the fisheries information web

Janet Webster, Hatfield Marine Science Center, Oregon State University (United States)

Jean Collins, Fisheries Library, Food and Agriculture Organization of the United Nations (Italy)

The Impact of Grey Literature in Advancing Global Karst Research

Todd Chavez, Pete Reehling, Anna Perrault and Courtney Crummett, University of South Florida (United States)

Assessing the Diffusion and Impact of Grey Literature Published by International Intergovernmental Scientific Groups: The Case of the Gulf of Maine Council on the Marine Environment

Bertrum H. MacDonald, Ruth E. Cordes, & Peter G. Wells, Dalhousie University, School of Information Management & School for Resource and Environmental Studies (Canada)

● PARALLEL SESSION II (Parallel Sessions run simultaneous with Roundtables on both days of the conference)

Chair, Bertrum H. MacDonald, Dalhousie University, School of Information Management (Canada)

The Messy World of Grey Literature in Cyber Security

Patricia Erwin, Institute for Information Infrastructure Protection (United States)

Nuclear Nonproliferation and Export Control Regulations, Recent Events, and Analysis

Laura Maddux, Dorothy Ogdon, Amy Taylor, Kelli Williams, and Liuyan Yang, School of Information Science, University of Tennessee, Knoxville Oak Ridge National Laboratory (United States)

A Public Health Grey Literature Knowledge Management Repository

Debra Revere, Paul F. Bugni, and Sherrilynne S. Fuller, Center of Excellence in Public Health Informatics, School of Public Health & Community Medicine (United States)

Digitization of Theses in Acharya Ranga Agricultural University: A Case Study and Future Prospects

C. Sugunavathi, Acharya Ranga Agricultural University (India)

● CLOSING SESSION - REPORTS FROM THE ROUNDTABLES, EVALUATION, AND FAREWELL

Chair, Dominic J. Farace, Grey Literature Network Service (Netherlands)



Harnessing the Power of Grey

EIGHTH INTERNATIONAL CONFERENCE ON GREY LITERATURE

Lindy C. Boggs
International Conference Center
New Orleans, Louisiana USA
4-5 December 2006

Conference Program

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● ROUNDTABLE 1

CURRICULUM DEVELOPMENT AND GREY LITERATURE

Facilitator, *Julia Gelfand, University of California, Irvine, UCI (United States)*

FACILITATOR'S CONTRIBUTION:

- *Grey Literature - Taxonomies and Structures for Collection Development*

Further Contributions:

(Pooled from the Conference Program and Participants who sign-up for this Roundtable)

TARGETED GROUPS:

Instructors, Graduate Students, Researchers, Field Workers, etc.

● ROUNDTABLE 2

METADATA SCHEMES AND REPOSITORIES FOR GREY LITERATURE

Facilitator, *Daniela Luzi, National Research Council, CNR-IRPPS (Italy)*

FACILITATOR'S CONTRIBUTION:

- *Metadata-based analysis to improve clinical trial exchange / together with Fabrizio L. Ricci and Luca Dan Serbanati*

Further Contributions:

(Pooled from the Conference Program and Participants who sign-up for this Roundtable)

- *Does online mean availability? A Virtual Library for PA / Alessandra Cornero (Italy)*

TARGETED GROUPS:

Librarians, Documentalists, Archivists, Information Technicians, Researchers, etc.

● ROUNDTABLE 3

QUALITY ASSESSMENT OF GREY LITERATURE

Facilitator, *Paola De Castro, Istituto Superiore di Sanità, ISS (Italy)*

FACILITATOR'S CONTRIBUTION:

- *Awareness and empowerment as a "must" for open access: sharing experiences in the creation and development of the "Nancy Style" to guarantee quality in document production and distribution / together with Sandra Salinetti and Marcus Banks*

Further Contributions:

(Pooled from the Conference Program and Participants who sign-up for this Roundtable)

TARGETED GROUPS:

Authors, Editors, Publishers, Etc.

About the Authors

Julia Gelfand has been a librarian with the University of California, Irvine Libraries since 1981. She has been tracking the grey literature movement since the late 1980s and has participated in all of the previous GL conferences and has published and presented widely on different topics in grey literature. Her particular interests are in scholarly communications, electronic publishing, collection development, bibliography of science and technology, and she thinks that with more emphasis on networking and digital libraries, Grey Literature has a very interesting future. She is currently the chair of the IFLA Science & Technology Section and vice-chair/chair-elect of the ALA ACRL Science & Technology Section. Email: jgelfand@uci.edu

Toby Green has a degree in Microbiology and Virology from the University of Warwick, but preferred to exploit his experience publishing the university's newspaper and on leaving joined Academic Press to promote books. He subsequently worked for Applied Science Publishers, Pergamon and Elsevier learning along the way to market and publish journals, encyclopedias, books and abstracting & indexing services. After a short period as a publishing consultant, he joined the Organisation for Economic Co-operation and Development (OECD) in 1998 as Head of Dissemination and Marketing for the Publishing Division. In 2001 he oversaw the launch of the OECD's e-library, SourceOECD, a service that delivers access to all OECD books, journals, statistical databases, reference works and working papers and has helped manage the transformation of OECD from being only a print publisher to being an online information provider as well. Email: Toby.GREEN@oecd.org

Catherine Jones was born in the UK in 1964 and graduated from Thames Polytechnic with a degree in Computer and Communication Systems. She joined the Rutherford Appleton Laboratory as a Database Systems Analyst/Programmer and worked on internal management information systems. In 1994 she transferred to the CCLRC Library and Information Service as Systems Librarian and was responsible for Library IT strategy, policy and developments. She is now the Library Systems Development Manager. Since 2003 she has been the project manager for CCLRC's Institutional Repository. Email: C.M.Jones@rl.ac.uk

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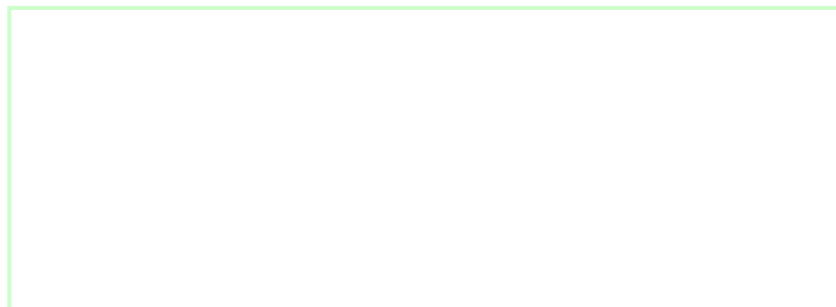
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